Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-133

NORTH ANNA-LADYSMITH 500 KV

90 MW Capacity / 150 MW Energy

January 2021

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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 a Solar generating facility located in Spotsylvania 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 December 01, 2024. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-133
Project Name	NORTH ANNA-LADYSMITH 500 KV
State	Virginia
County	Spotsylvania
Transmission Owner	Dominion
MFO	150
MWE	150
MWC	90
Fuel	Solar
Basecase Study Year	2024

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

4.1 Primary Point of Interconnection

AG1-133 "North Anna-Ladysmith 500 kV" will interconnect with the Dominion transmission system. The primary POI will be a newly constructed 500 kV three breaker ring bus located on the line between the North Anna substation and Ladysmith substation.

The IC is responsible for securing right-of-way, permits, and constructing the proposed attachment line from the generating facility site to the Point of Interconnection. The IC may not install any facilities on Dominion's right-of-way without first obtaining the necessary approval from Dominion Energy.

Attachment 1 shows a one-line diagram of the proposed interconnection facilities.

4.2 Secondary Point of Interconnection

The IC requested that a secondary POI be reviewed for network impacts.

The secondary POI for AG1-133 is a new tap on the North Anna–Morrisville 500 kV line.

This report does not provide costs for the interconnection of the secondary POI.The secondary POI was analyzed for network impacts. Network impact results are shown in the Summer Peak - Load Flow Analysis – Secondary Point of Interconnection section of this report.

5 Cost Summary

The AG1-133 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 21,950,000
Total System Network Upgrade Costs	$130,097,000[1]
Total Costs	**$152,047,000**

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 2016-36, 2016-25 I.R.B. (6/20/2016). 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.

[1] This project currently contributes to overloads of the Transmission System (see Summer Peak Load Flow Analysis section below) and therefore has potential to have cost allocation for the system reinforcements listed in the report. This will be re-evaluated in the System Impact phase. The results may vary with queue customers withdrawing from the queue and other generators deactivating over time. If a customer is the first to cause the need for a project (causes loading to exceed 100% of rating), then the customer is responsible. If a customer contributes to a facility that is already overloaded by a prior queue, then they may receive cost allocation.

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

6 Transmission Owner Scope of Work

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of AG1-133 to the Dominion Transmission System is detailed in the following sections. The associated one-line showing the generation project attachment facilities and primary direct and non-direct connection is 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 phase. 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	$ 2,750,000
500 kV Three Breaker Ring-Bus Substation	$17,000,000
Re-arrange line and tie-in new substation	$ 2,200,000
Total Physical Interconnection Costs	**$21,950,000**

AG1-133 "North Anna-Ladysmith 500 kV" will interconnect with the Dominion transmission system. The primary POI will be a newly constructed 500 kV three breaker ring bus located on the line between the North Anna substation and Ladysmith substation.

It is estimated to take **18-30 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.

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 estimated schedule for the Attachment Facilities, Direct Connection and Non-Direct Connection work is identified in the "Transmission Owner Scope of Work" section of this report.

If the customer is ultimately responsible for network upgrades, then the schedule for those upgrades will be refined in future study phases. The customer would need to wait for those upgrades to be completed prior to commercial operation unless determined deliverable by an interim deliverability study. The elapsed time to complete any network upgrades is provided in the System Reinforcements table of this report[1].

8 Transmission Owner Analysis

Dominion assessed the impact of the proposed AG1-133 for compliance with NERC Reliability Criteria on the Dominion Transmission System. The system was assessed using the summer 2024 AG1 case provided to Dominion by PJM.

When performing a generation analysis, Dominion's main analysis includes load flow study results following a single contingency event for 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.

8.1 Power Flow Analysis

PJM performed a power flow analysis of the transmission system using a 2024 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.

8.2 Short Circuit Analysis

No impacts.

8.3 Stability Analysis

To be performed in Facilities Study phase.

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 section 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) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter2) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- 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

The IC will be required to comply with all Interconnected Transmission Owner's revenue metering requirements for generation interconnection customers located at the following link:

http://www.pjm.com/planning/design-engineering/to-tech-standards/

11 Summer Peak - Load Flow Analysis - Primary POI

The Queue Project AG1-133 was evaluated as a 150.0 MW (Capacity 90.0 MW) injection tapping the North Anna to Ladysmith 500 kV line in the Dominion area. Project AG1-133 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-133 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)

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
163549906	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	116.78	117.47	DC	90.63
163549907	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P4-2: H1T575	breaker	3938.0	112.52	113.21	DC	90.09
163550191	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 575-A	single	3218.56005859	117.58	119.28	DC	54.06
163549891	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	123.39	124.12	DC	87.01
163549892	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P4-2: H1T575	breaker	3938.0	118.32	119.07	DC	86.4
163550136	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 575-A	single	3218.56005859	113.5	115.11	DC	51.85
163549916	962840	AG1-133 TAP	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P4-2: 515T573	breaker	3938.0	113.18	114.77	DC	111.63
163549917	962840	AG1-133 TAP	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P4-2: H1T573	breaker	3938.0	112.6	114.25	DC	111.72
163550177	962840	AG1-133 TAP	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 594	single	3218.56005859	109.88	111.9	DC	65.59
163550178	962840	AG1-133 TAP	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 573	single	3218.56005859	110.21	112.23	DC	66.99

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
163550290	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1-2: LN 594	operation	4070.19995117	103.11	103.22	DC	41.92
163550094	314911	8LADYSMITH	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1-2: LN 581	operation	2442.12011719	158.35	158.47	DC	31.97
163550277	314911	8LADYSMITH	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1-2: LN 573	operation	4070.19995117	104.67	104.96	DC	42.86
163550187	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 575-A	operation	3218.56005859	137.48	138.32	DC	90.1
163550128	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 575-A	operation	3218.56005859	144.6	145.52	DC	86.41
163550138	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	Base Case	operation	3218.56005859	104.25	104.43	DC	37.12
163550175	962840	AG1-133 TAP	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 573	operation	3218.56005859	137.88	139.83	DC	111.65

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
163549892,163550136,163549891	2	8SPOTSYL 500.0 kV - 8MORRSVL 500.0 kV Ckt 1	**DVP** **n6160 (1563) : 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
163549906,163549907,163550191	1	8NO ANNA 500.0 kV - 8SPOTSYL 500.0 kV Ckt 1	**DVP** **n6132 (1550) : 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
163550177,163549917,163549916,163550178	3	AG1-133 TAP 500.0 kV - 8LADYSMITH 500.0 kV Ckt 1	**DVP** **dom-413 (1800) : Rebuild 9.1 miles of 500 kV Line 575 from Ladysmith to AG1-133 Tap with 3-1351.5 113C ACSR. Replace wave Trap, Lien lead at Ladysmith terminal.** **Project Type : FAC** **Cost : $28,510,000** **Time Estimate : 36-40 Months**	$28,510,000
			TOTAL COST	**$130,097,000**[1]

11.6 Flow Gate Details - Primary POI

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
163550191	314918	8NO ANNA	DVP	314934	8SPOTSYL	DVP	1	DVP_P1-2: LN 575-A	single	3218.56	117.58	119.28	DC	54.06

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313506	AB1-173 C OP	5.3873	Adder	6.34
314295	6BIRDNECK	0.0398	80/20	0.0398
314333	6POWHATN	0.4112	80/20	0.4112
314435	6SAPONY	0.3753	80/20	0.3753
314491	3PENDLTN	0.2973	80/20	0.2973
314572	3EMPORIA	0.3372	Adder	0.4
315083	**1SPRUNCA (Deactivation : 12/01/2021)**	**7.8624**	**Adder**	**9.25**
315084	**1SPRUNCB (Deactivation : 12/01/2021)**	**7.8624**	**Adder**	**9.25**
315102	1BRUNSWICKG1	8.5725	80/20	8.5725
315103	1BRUNSWICKG2	8.5725	80/20	8.5725
315104	1BRUNSWICKG3	8.5725	80/20	8.5725
315105	1BRUNSWICKS1	17.8092	80/20	17.8092
315108	1ELIZAR1	2.9036	80/20	2.9036
315109	1ELIZAR2	2.8532	80/20	2.8532
315110	1ELIZAR3	2.9408	80/20	2.9408
315153	1CLOVER1	12.1430	80/20	12.1430
315154	1CLOVER2	12.0220	80/20	12.0220
315172	1LOISA A	2.1514	80/20	2.1514
315173	1LOISA B	2.1626	80/20	2.1626
315174	1LOISA C	2.1626	80/20	2.1626
315175	1LOISA D	2.1626	80/20	2.1626
315176	1LOISA E	4.4089	80/20	4.4089
315177	1S ANNAG1	1.7404	80/20	1.7404
315178	1S ANNAS1	0.8944	80/20	0.8944
315179	1S ANNAG2	1.7404	80/20	1.7404
315180	1S ANNAS2	0.8944	80/20	0.8944
315225	1N ANNA1	89.8913	80/20	89.8913
315226	1N ANNA2	89.9292	80/20	89.9292
315241	1Z1-086 GT1	11.0217	80/20	11.0217
315242	1Z1-086 GT2	11.0217	80/20	11.0217
315243	1Z1-086 GT3	11.0217	80/20	11.0217
315244	1Z1-086 ST	19.1598	80/20	19.1598
315293	1DOMTR9	5.3809	Adder	6.33
315294	1DOMTR10	6.5943	Adder	7.76
316083	AB2-161 C	2.6027	Adder	3.06
316103	AB2-015 C	6.8340	Adder	8.04
316108	AB2-160 C	3.9667	Adder	4.67
316140	**AB2-099 C (Suspended)**	**0.4625**	**Adder**	**0.54**
923991	AB2-040 C O1	5.8673	Adder	6.9
925021	AB2-158 C	3.2738	80/20	3.2738

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
926070	AC1-086 C	16.3564	Adder	19.24
926754	AC1-161 C	28.6579	80/20	28.6579
932044	AC2-012 C	8.1362	Adder	9.57
932581	AC2-078 C O1	3.1206	Adder	3.67
932591	AC2-079 C O1	4.4801	Adder	5.27
933294	AC2-141 C	28.6579	80/20	28.6579
933501	AC2-165 C	10.2725	80/20	10.2725
933731	AC2-196 C	0.2660	80/20	0.2660
933991	AD1-023 C	10.3843	Adder	12.22
934061	AD1-033 C	7.0799	80/20	7.0799
934521	AD1-076 C	43.0128	Adder	50.6
934575	AD1-082 C	5.9315	Adder	6.98
934615	AD1-087 C	7.6077	80/20	7.6077
934625	AD1-088 C	10.0606	Adder	11.84
935171	AD1-152 C O1	8.3563	80/20	8.3563
936401	AD2-051 C O1	6.9327	Adder	8.16
936661	AD2-085 C	2.7045	Adder	3.18
936761	AD2-097 C	1.4911	Adder	1.75
937221	AD2-160 C O1	4.6838	Adder	5.51
937481	AD2-202 C O1	2.2284	80/20	2.2284
938494	AE1-068_C1	33.0018	80/20	33.0018
938497	AE1-068_C2	33.0018	80/20	33.0018
938504	AE1-069_C1	25.1510	80/20	25.1510
938507	AE1-069_C2	27.1189	80/20	27.1189
938535	AE1-072 C	14.0943	Adder	16.58
938551	AE1-074 C	0.3854	80/20	0.3854
938561	AE1-075 C	0.3576	80/20	0.3576
938634	AE1-085 C	6.8382	Adder	8.04
938771	AE1-103 C	2.8938	Adder	3.4
939195	AE1-149 C	8.1753	Adder	9.62
939231	AE1-154 C	3.4017	80/20	3.4017
939414	AE1-173_C1	33.2842	80/20	33.2842
939415	AE1-173_C2	28.5293	80/20	28.5293
939416	AE1-173_C3	33.2842	80/20	33.2842
940061	AE2-000BC O1	8.2309	Adder	9.68
940251	**AE2-007 O1 (Withdrawn : 12/11/2020)**	**162.7503**	**80/20**	**162.7503**
940471	AE2-031 C	36.0458	80/20	36.0458
940481	AE2-033 C	15.2359	80/20	15.2359
940491	AE2-034 C	5.7063	Adder	6.71
940541	AE2-040	2.7061	80/20	2.7061
940641	AE2-051 C O1	18.7101	80/20	18.7101
940651	AE2-052	2.7251	Adder	3.21
940891	AE2-078 C	1.7347	Adder	2.04
940901	AE2-079 C	1.7347	Adder	2.04
941031	AE2-094 C	43.2095	80/20	43.2095
941101	AE2-104 C O1	2.6619	Adder	3.13
941281	AE2-122 C O1	26.7429	80/20	26.7429
941291	AE2-123 C O1	27.4834	80/20	27.4834
941301	AE2-124 C O1	24.9985	80/20	24.9985
941501	AE2-147 C	12.6355	Adder	14.87
941591	AE2-156 O1	14.2843	Adder	16.81

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
941791	AE2-182 C	1.6345	Adder	1.92
942001	AE2-212 C	1.5765	Adder	1.85
942131	AE2-225 C	1.7030	Adder	2.0
942171	AE2-229 C	1.2772	Adder	1.5
942341	AE2-247 C	1.1721	Adder	1.38
942371	AE2-250 C O1	7.0461	Adder	8.29
942401	AE2-253 C	4.9266	Adder	5.8
942471	AE2-260 C O1	11.5586	Adder	13.6
942931	AE2-313 C	38.9743	80/20	38.9743
943171	AE2-346 C	1.1101	Adder	1.31
943461	AF1-017 C	1.0605	Adder	1.25
943611	AF1-032 C	1.3908	Adder	1.64
943621	AF1-033 C	1.7347	Adder	2.04
944011	AF1-069 C	14.1182	80/20	14.1182
944111	AF1-079 C	6.4632	80/20	6.4632
944581	AF1-123 C O1	45.4937	80/20	45.4937
944591	AF1-124 C O1	45.4937	80/20	45.4937
944601	AF1-125 C O1	45.4937	80/20	45.4937
944871	AF1-152 C	4.2118	Adder	4.96
945711	AF1-236 C O1	62.4703	Adder	73.49
945811	AF1-246 C O1	7.7150	80/20	7.7150
946011	AF1-266	12.7537	80/20	12.7537
946281	AF1-292 C	1.2059	Adder	1.42
946371	AF1-301 C	26.4313	80/20	26.4313
957431	AF2-037 C	23.6716	80/20	23.6716
957481	AF2-042 C	55.1070	80/20	55.1070
957491	AF2-043 C	1.7030	Adder	2.0
957521	AF2-046 C	13.2844	Adder	15.63
957531	AF2-047 C	13.5592	Adder	15.95
957631	AF2-057	2.8548	Adder	3.36
957691	AF2-063 C	37.7739	80/20	37.7739
957821	AF2-076 C	4.2315	Adder	4.98
957871	AF2-081 C	7.9849	Adder	9.39
957911	AF2-085	4.4374	80/20	4.4374
958141	AF2-108	1.3705	Adder	1.61
958161	AF2-110 C	1.0974	Adder	1.29
958501	AF2-144 C	1.9264	80/20	1.9264
959531	**AF2-244 C (Withdrawn : 01/06/2021)**	**1.7753**	**80/20**	**1.7753**
959671	AF2-258 C	0.3941	Adder	0.46
959681	AF2-259 C	2.0557	Adder	2.42
959751	AF2-266	8.7165	80/20	8.7165
960081	AF2-299 C	2.0324	Adder	2.39
961091	AF2-400 C	0.3690	Adder	0.43
961611	AG1-000B C	6.1986	Adder	13.76
961681	AG1-008 C	7.0548	Adder	15.66
961811	AG1-023 C	6.6720	80/20	6.6720
961851	AG1-027 C	7.1453	Adder	15.86
961931	AG1-036 C	0.5693	Adder	1.26
961941	AG1-037 C	0.2101	Adder	0.47
962271	AG1-075 C O1	6.4454	Adder	14.31
962321	**AG1-081 C (Withdrawn : 01/15/2021)**	**0.8358**	**Adder**	**1.86**

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
962331	AG1-082 C	0.8405	Adder	1.87
962341	AG1-083 C	0.8405	Adder	1.87
962351	AG1-084 C	0.7332	Adder	1.63
962361	AG1-085 C	0.7332	Adder	1.63
962491	AG1-098 C O1	12.7328	80/20	12.7328
962561	AG1-105 C O1	10.1412	80/20	10.1412
962571	AG1-106 C	2.4107	Adder	5.35
962841	AG1-133 C O1	54.0612	80/20	54.0612
963041	AG1-153 C	6.0150	80/20	6.0150
963111	AG1-160 C	6.0924	80/20	6.0924
963271	AG1-176 C O1	6.6494	Adder	14.76
963291	AG1-178 C O1	66.5022	80/20	66.5022
963301	AG1-179 C	2.3428	Adder	5.2
963311	AG1-180	1.1415	Adder	2.53
963351	AG1-184 O1	35.8278	80/20	35.8278
963821	AG1-235 C O1	22.7232	80/20	22.7232
964421	AG1-305 C O1	29.7155	80/20	29.7155
964491	AG1-312 C O1	7.8646	Adder	17.46
964501	AG1-313 C O1	1.9170	Adder	4.26
964801	AG1-343 C	2.4843	Adder	5.51
964841	AG1-347 C	4.1492	Adder	9.21
964931	AG1-357 C	22.8600	80/20	22.8600
964951	AG1-359 O1	25.2930	80/20	25.2930
965001	AG1-364 C O1	3.0279	Adder	6.72
965181	AG1-383 C	2.5983	80/20	2.5983
965291	AG1-394 C	0.8525	Adder	1.89
965601	AG1-428 C O1	1.9558	Adder	4.34
965631	AG1-431	19.1685	Adder	42.55
965691	AG1-437 C O1	4.2380	Adder	9.41
965701	AG1-438 C O1	4.2380	Adder	9.41
965741	AG1-442 O1	2.4722	Adder	5.49
965751	AG1-443 O1	2.4722	Adder	5.49
965811	AG1-449	25.2735	80/20	25.2735
966361	AG1-505 C	17.8326	80/20	17.8326
966371	AG1-506 C	17.8326	80/20	17.8326
966491	AG1-518 O1	3.7608	Adder	8.35
966501	AG1-519 C	0.8744	Adder	1.94
966621	AG1-532 C	0.5817	Adder	1.29
966731	AG1-544 C	2.8306	Adder	6.28
966741	AG1-545 C	0.9441	Adder	2.1
966811	AG1-552 C	0.8722	Adder	1.94
966931	AG1-431A	14.4016	Adder	31.97
WEC	WEC	0.6470	Confirmed LTF	0.6470
LGEE	LGEE	1.3961	Confirmed LTF	1.3961
CPLE	CPLE	7.8952	Confirmed LTF	7.8952
CBM-W2	CBM-W2	31.8618	Confirmed LTF	31.8618
NY	NY	2.5272	Confirmed LTF	2.5272
TVA	TVA	6.2496	Confirmed LTF	6.2496
SIGE	SIGE	0.7851	Confirmed LTF	0.7851
CBM-S2	CBM-S2	95.3172	Confirmed LTF	95.3172
CBM-S1	CBM-S1	1.5417	Confirmed LTF	1.5417
MEC	MEC	4.0949	Confirmed LTF	4.0949

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
LAGN	LAGN	7.6807	Confirmed LTF	7.6807
AA2-074	AA2-074	5.2128	LTF	5.2128
CBM-W1	CBM-W1	25.9510	Confirmed LTF	25.9510

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
163549891	314934	8SPOTSYL	DVP	314916	8MORRSVL	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	123.39	124.12	DC	87.01

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314466	6FENTRES	1.8428	Adder	2.17
314550	6HICKORY	3.4038	Adder	4.0
315102	1BRUNSWICKG1	8.6883	50/50	8.6883
315103	1BRUNSWICKG2	8.6883	50/50	8.6883
315104	1BRUNSWICKG3	8.6883	50/50	8.6883
315105	1BRUNSWICKS1	18.0500	50/50	18.0500
315174	1LOISA C	2.4772	50/50	2.4772
315175	1LOISA D	2.4772	50/50	2.4772
315176	1LOISA E	5.0503	50/50	5.0503
315177	1S ANNAG1	1.9622	50/50	1.9622
315178	1S ANNAS1	1.0084	50/50	1.0084
315179	1S ANNAG2	1.9622	50/50	1.9622
315180	1S ANNAS2	1.0084	50/50	1.0084
315225	1N ANNA1	86.8071	50/50	86.8071
315226	1N ANNA2	86.8437	50/50	86.8437
315241	1Z1-086 GT1	11.1682	50/50	11.1682
315242	1Z1-086 GT2	11.1682	50/50	11.1682
315243	1Z1-086 GT3	11.1682	50/50	11.1682
315244	1Z1-086 ST	19.4145	50/50	19.4145
916192	Z1-068 E	1.5582	Adder	1.83
923852	AB2-025 E	0.9363	Adder	1.1
923862	AB2-026 E	1.0231	Adder	1.2
925021	AB2-158 C	3.3496	50/50	3.3496
925022	AB2-158 E	9.4670	50/50	9.4670
926001	AC1-076 C	6.7621	50/50	6.7621
926002	AC1-076 E	10.9954	50/50	10.9954
926481	AC1-120 C O1	8.3223	50/50	8.3223
926482	AC1-120 E O1	4.2873	50/50	4.2873
926501	AC1-121 C O1	2.8582	50/50	2.8582
926502	AC1-121 E O1	1.3450	50/50	1.3450
926737	AC1-158 C1	18.8702	50/50	18.8702
926738	AC1-158 C2	18.8702	50/50	18.8702
926739	AC1-158 E1	52.4890	50/50	52.4890
926740	AC1-158 E2	52.4890	50/50	52.4890
926754	AC1-161 C	25.2742	Adder	29.73
926755	AC1-161 E	10.7889	Adder	12.69
933294	AC2-141 C	25.2742	Adder	29.73
933295	AC2-141 E	10.7889	Adder	12.69
933501	AC2-165 C	9.0073	Adder	10.6
933502	AC2-165 E	6.7792	Adder	7.98
933732	AC2-196 E	0.9899	Adder	1.16

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934061	AD1-033 C	6.2414	Adder	7.34
934062	AD1-033 E	4.1610	Adder	4.9
934615	AD1-087 C	6.5936	Adder	7.76
934616	AD1-087 E	2.8215	Adder	3.32
935171	AD1-152 C O1	7.2424	Adder	8.52
935172	AD1-152 E O1	4.8283	Adder	5.68
937481	AD2-202 C O1	1.9313	Adder	2.27
937482	AD2-202 E O1	1.0864	Adder	1.28
938494	AE1-068_C1	33.4333	50/50	33.4333
938497	AE1-068_C2	33.4333	50/50	33.4333
938498	AE1-068_E1	18.4817	50/50	18.4817
938499	AE1-068_E2	18.4817	50/50	18.4817
938504	AE1-069_C1	25.4799	50/50	25.4799
938507	AE1-069_C2	27.4734	50/50	27.4734
938508	AE1-069_E1	14.4947	50/50	14.4947
938509	AE1-069_E2	15.6160	50/50	15.6160
938552	AE1-074 E	1.0824	Adder	1.27
938562	AE1-075 E	0.9736	Adder	1.15
939231	AE1-154 C	3.4805	50/50	3.4805
939232	AE1-154 E	2.4363	50/50	2.4363
939414	AE1-173_C1	28.8670	Adder	33.96
939415	AE1-173_C2	24.7432	Adder	29.11
939416	AE1-173_C3	28.8670	Adder	33.96
939423	AE1-173_E1	19.2447	Adder	22.64
939424	AE1-173_E2	16.4954	Adder	19.41
939425	AE1-173_E3	19.2447	Adder	22.64
940471	AE2-031 C	36.5139	50/50	36.5139
940472	AE2-031 E	24.3426	50/50	24.3426
940481	AE2-033 C	13.3492	Adder	15.7
940482	AE2-033 E	8.9995	Adder	10.59
940541	AE2-040	2.3709	Adder	2.79
940641	AE2-051 C O1	19.0062	50/50	19.0062
940642	AE2-051 E O1	12.6708	50/50	12.6708
941031	AE2-094 C	43.7586	50/50	43.7586
941032	AE2-094 E	19.5984	50/50	19.5984
941281	AE2-122 C O1	23.5837	Adder	27.75
941282	AE2-122 E O1	95.1659	Adder	111.96
941291	AE2-123 C O1	24.2367	Adder	28.51
941292	AE2-123 E O1	94.5129	Adder	111.19
941301	AE2-124 C O1	22.0439	Adder	25.93
941302	AE2-124 E O1	96.7261	Adder	113.8
941381	**AE2-134 (Suspended)**	**4.6596**	**50/50**	**4.6596**
942931	AE2-313 C	39.4830	50/50	39.4830
942932	AE2-313 E	26.3220	50/50	26.3220
944011	AF1-069 C	14.2976	50/50	14.2976
944012	AF1-069 E	5.5543	50/50	5.5543
944111	AF1-079 C	6.6129	50/50	6.6129
944112	AF1-079 E	8.9797	50/50	8.9797
944581	AF1-123 C O1	40.0862	Adder	47.16
944582	AF1-123 E O1	91.7862	Adder	107.98
944591	AF1-124 C O1	40.0862	Adder	47.16
944592	AF1-124 E O1	91.7862	Adder	107.98

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944601	AF1-125 C O1	40.0862	Adder	47.16
944602	AF1-125 E O1	91.7862	Adder	107.98
945811	AF1-246 C O1	6.6716	Adder	7.85
945812	AF1-246 E O1	9.2132	Adder	10.84
946011	AF1-266	11.1743	Adder	13.15
946371	AF1-301 C	26.9671	50/50	26.9671
946372	AF1-301 E	18.0963	50/50	18.0963
957431	AF2-037 C	23.6254	50/50	23.6254
957432	AF2-037 E	15.7503	50/50	15.7503
957481	AF2-042 C	47.6544	Adder	56.06
957482	AF2-042 E	31.7696	Adder	37.38
957691	AF2-063 C	37.7001	50/50	37.7001
957692	AF2-063 E	25.1334	50/50	25.1334
957911	AF2-085	4.5106	50/50	4.5106
958501	AF2-144 C	1.6831	Adder	1.98
958502	AF2-144 E	1.1221	Adder	1.32
959531	**AF2-244 C (Withdrawn : 01/06/2021)**	**1.5511**	**Adder**	**1.82**
959532	**AF2-244 E (Withdrawn : 01/06/2021)**	**0.9241**	**Adder**	**1.09**
959751	AF2-266	7.5539	Adder	8.89
961811	AG1-023 C	6.6186	50/50	6.6186
961812	AG1-023 E	26.4744	50/50	26.4744
962841	AG1-133 C O1	52.2063	50/50	52.2063
962842	AG1-133 E O1	34.8042	50/50	34.8042
963041	AG1-153 C	6.0963	50/50	6.0963
963042	AG1-153 E	9.1444	50/50	9.1444
963111	AG1-160 C	6.1734	50/50	6.1734
963112	AG1-160 E	9.2601	50/50	9.2601
963291	AG1-178 C O1	67.6590	50/50	67.6590
963351	AG1-184 O1	36.4510	50/50	36.4510
963821	AG1-235 C O1	7.6704	Adder	17.03
963822	AG1-235 E O1	5.1136	Adder	11.35
964271	AG1-288 C	33.7514	50/50	33.7514
964281	AG1-289	18.6631	50/50	18.6631
964421	AG1-305 C O1	29.6574	50/50	29.6574
964422	AG1-305 E O1	19.7716	50/50	19.7716
964931	AG1-357 C	10.4628	Adder	23.22
964932	AG1-357 E	6.9752	Adder	15.48
964951	AG1-359 O1	11.8168	Adder	26.23
965181	AG1-383 C	1.2140	Adder	2.69
965182	AG1-383 E	0.3595	Adder	0.8
965811	AG1-449	25.6017	50/50	25.6017
965971	AG1-466 C	0.7619	Adder	1.69
965972	AG1-466 E	0.5079	Adder	1.13
965981	AG1-467 C	0.8490	Adder	1.88
965982	AG1-467 E	0.5660	Adder	1.26
966001	AG1-469 C	0.8391	Adder	1.86
966002	AG1-469 E	0.5594	Adder	1.24
966331	AG1-502 C	10.3757	50/50	10.3757
966332	AG1-502 E	6.9171	50/50	6.9171
966341	AG1-503 C	2.5939	50/50	2.5939
966342	AG1-503 E	1.7293	50/50	1.7293

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
966361	AG1-505 C	8.1495	Adder	18.09
966362	AG1-505 E	5.4330	Adder	12.06
966371	AG1-506 C	8.1495	Adder	18.09
966372	AG1-506 E	5.4330	Adder	12.06
966501	AG1-519 C	1.0116	Adder	2.25
966502	AG1-519 E	0.6744	Adder	1.5
WEC	WEC	0.6612	Confirmed LTF	0.6612
LGEE	LGEE	1.4332	Confirmed LTF	1.4332
CPLE	CPLE	8.0897	Confirmed LTF	8.0897
CBM-W2	CBM-W2	32.7309	Confirmed LTF	32.7309
NY	NY	2.8004	Confirmed LTF	2.8004
TVA	TVA	6.4316	Confirmed LTF	6.4316
O-066	O-066	37.9707	Confirmed LTF	37.9707
SIGE	SIGE	0.8499	Confirmed LTF	0.8499
CBM-S2	CBM-S2	97.8332	Confirmed LTF	97.8332
CBM-S1	CBM-S1	1.5861	Confirmed LTF	1.5861
G-007	G-007	5.9598	Confirmed LTF	5.9598
MEC	MEC	4.1965	Confirmed LTF	4.1965
LAGN	LAGN	7.8960	Confirmed LTF	7.8960
AA2-074	AA2-074	5.3410	LTF	5.3410
CBM-W1	CBM-W1	26.4137	Confirmed LTF	26.4137

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
163549917	962840	AG1-133 TAP	DVP	314911	8LADYSMITH	DVP	1	DVP_P4-2: H1T573	breaker	3938.0	112.6	114.25	DC	111.72

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313717	6SLIGO L2192	1.4890	Adder	1.75
314466	6FENTRES	1.5031	Adder	1.77
314550	6HICKORY	2.7774	Adder	3.27
314632	6AYDLETOLD	1.4954	Adder	1.76
315172	1LOISA A	2.7514	50/50	2.7514
315173	1LOISA B	2.7657	50/50	2.7657
315174	1LOISA C	2.7657	50/50	2.7657
315175	1LOISA D	2.7657	50/50	2.7657
315176	1LOISA E	5.6384	50/50	5.6384
315177	1S ANNAG1	2.2031	50/50	2.2031
315178	1S ANNAS1	1.1321	50/50	1.1321
315179	1S ANNAG2	2.2031	50/50	2.2031
315180	1S ANNAS2	1.1321	50/50	1.1321
315225	1N ANNA1	103.2770	50/50	103.2770
315226	1N ANNA2	103.3205	50/50	103.3205
315241	1Z1-086 GT1	10.5278	50/50	10.5278
315242	1Z1-086 GT2	10.5278	50/50	10.5278
315243	1Z1-086 GT3	10.5278	50/50	10.5278
315244	1Z1-086 ST	18.3013	50/50	18.3013
316097	AB2-100 E1	2.0209	Adder	2.38
316099	AB2-100 E2	2.0209	Adder	2.38
916192	Z1-068 E	1.2677	Adder	1.49
919152	AA1-139 E	4.3486	Adder	5.12
923852	AB2-025 E	0.7970	Adder	0.94
923862	AB2-026 E	0.9488	Adder	1.12
925021	AB2-158 C	3.8973	50/50	3.8973
925022	AB2-158 E	11.0149	50/50	11.0149
925522	AC1-027 E	0.7723	Adder	0.91
926754	AC1-161 C	20.5462	Adder	24.17
926755	AC1-161 E	8.7706	Adder	10.32
933294	AC2-141 C	20.5462	Adder	24.17
933295	AC2-141 E	8.7706	Adder	10.32
933501	AC2-165 C	8.3426	Adder	9.81
933502	AC2-165 E	6.2789	Adder	7.39
933732	AC2-196 E	0.8074	Adder	0.95
934061	AD1-033 C	5.0890	Adder	5.99
934062	AD1-033 E	3.3927	Adder	3.99
934615	AD1-087 C	6.1456	Adder	7.23
934616	AD1-087 E	2.6298	Adder	3.09
934625	AD1-088 C	9.5848	Adder	11.28
934626	AD1-088 E	2.5103	Adder	2.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935171	AD1-152 C O1	6.7504	Adder	7.94
935172	AD1-152 E O1	4.5002	Adder	5.29
937221	AD2-160 C O1	3.9662	Adder	4.67
937222	AD2-160 E O1	2.0798	Adder	2.45
937481	AD2-202 C O1	1.8001	Adder	2.12
937482	AD2-202 E O1	1.0126	Adder	1.19
938494	AE1-068_C1	31.5351	50/50	31.5351
938497	AE1-068_C2	31.5351	50/50	31.5351
938498	AE1-068_E1	17.4324	50/50	17.4324
938499	AE1-068_E2	17.4324	50/50	17.4324
938504	AE1-069_C1	24.0332	50/50	24.0332
938507	AE1-069_C2	25.9136	50/50	25.9136
938508	AE1-069_E1	13.6717	50/50	13.6717
938509	AE1-069_E2	14.7294	50/50	14.7294
938535	AE1-072 C	11.9451	Adder	14.05
938536	AE1-072 E	6.1535	Adder	7.24
938552	AE1-074 E	0.9016	Adder	1.06
938562	AE1-075 E	0.9029	Adder	1.06
939231	AE1-154 C	4.0496	50/50	4.0496
939232	AE1-154 E	2.8347	50/50	2.8347
939414	AE1-173_C1	26.0396	Adder	30.63
939415	AE1-173_C2	22.3196	Adder	26.26
939416	AE1-173_C3	26.0396	Adder	30.63
939423	AE1-173_E1	17.3597	Adder	20.42
939424	AE1-173_E2	14.8798	Adder	17.51
939425	AE1-173_E3	17.3597	Adder	20.42
940251	**AE2-007 O1 (Withdrawn : 12/11/2020)**	**24.3014**	**Adder**	**28.59**
940471	AE2-031 C	34.4624	50/50	34.4624
940472	AE2-031 E	22.9750	50/50	22.9750
940481	AE2-033 C	11.3702	Adder	13.38
940482	AE2-033 E	7.6653	Adder	9.02
940541	AE2-040	2.0182	Adder	2.37
940641	AE2-051 C O1	17.5950	50/50	17.5950
940642	AE2-051 E O1	11.7300	50/50	11.7300
941031	AE2-094 C	41.3178	50/50	41.3178
941032	AE2-094 E	18.5052	50/50	18.5052
941281	AE2-122 C O1	19.1900	Adder	22.58
941282	AE2-122 E O1	77.4364	Adder	91.1
941291	AE2-123 C O1	19.7214	Adder	23.2
941292	AE2-123 E O1	76.9051	Adder	90.48
941301	AE2-124 C O1	17.9429	Adder	21.11
941302	AE2-124 E O1	78.7312	Adder	92.62
941791	AE2-182 C	1.5572	Adder	1.83
941792	AE2-182 E	0.7249	Adder	0.85
942401	AE2-253 C	4.1718	Adder	4.91
942402	AE2-253 E	1.8743	Adder	2.21
942461	AE2-259 C O1	7.2644	Adder	8.55
942462	AE2-259 E O1	4.8430	Adder	5.7
942471	AE2-260 C O1	10.1872	Adder	11.98
942472	AE2-260 E O1	14.4492	Adder	17.0
942931	AE2-313 C	37.2618	50/50	37.2618

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942932	AE2-313 E	24.8412	50/50	24.8412
944011	AF1-069 C	13.5001	50/50	13.5001
944012	AF1-069 E	5.2445	50/50	5.2445
944111	AF1-079 C	7.6942	50/50	7.6942
944112	AF1-079 E	10.4480	50/50	10.4480
944581	AF1-123 C O1	32.7943	Adder	38.58
944582	AF1-123 E O1	75.0897	Adder	88.34
944591	AF1-124 C O1	32.7943	Adder	38.58
944592	AF1-124 E O1	75.0897	Adder	88.34
944601	AF1-125 C O1	32.7943	Adder	38.58
944602	AF1-125 E O1	75.0897	Adder	88.34
945811	AF1-246 C O1	6.2443	Adder	7.35
945812	AF1-246 E O1	8.6231	Adder	10.14
946011	AF1-266	9.5177	Adder	11.2
946371	AF1-301 C	31.4100	50/50	31.4100
946372	AF1-301 E	21.0778	50/50	21.0778
957431	AF2-037 C	27.7499	50/50	27.7499
957432	AF2-037 E	18.5000	50/50	18.5000
957481	AF2-042 C	44.6020	Adder	52.47
957482	AF2-042 E	29.7347	Adder	34.98
957691	AF2-063 C	44.2818	50/50	44.2818
957692	AF2-063 E	29.5212	50/50	29.5212
957871	AF2-081 C	6.7644	Adder	7.96
957872	AF2-081 E	2.8990	Adder	3.41
957911	AF2-085	4.2006	50/50	4.2006
958501	AF2-144 C	1.5609	Adder	1.84
958502	AF2-144 E	1.0406	Adder	1.22
959531	AF2-244 C (Withdrawn : 01/06/2021)	1.4385	Adder	1.69
959532	AF2-244 E (Withdrawn : 01/06/2021)	0.8570	Adder	1.01
959751	AF2-266	7.0418	Adder	8.28
961811	AG1-023 C	7.7924	50/50	7.7924
961812	AG1-023 E	31.1694	50/50	31.1694
962491	AG1-098 C O1	5.4587	Adder	12.12
962492	AG1-098 E O1	3.6391	Adder	8.08
962561	AG1-105 C O1	4.3334	Adder	9.62
962562	AG1-105 E O1	2.8890	Adder	6.41
962841	AG1-133 C O1	67.0320	50/50	67.0320
962842	AG1-133 E O1	44.6880	50/50	44.6880
963041	AG1-153 C	2.5869	Adder	5.74
963042	AG1-153 E	3.8804	Adder	8.61
963111	AG1-160 C	2.6216	Adder	5.82
963112	AG1-160 E	8.7291	50/50	8.7291
963271	AG1-176 C O1	6.3375	Adder	14.07
963272	AG1-176 E O1	4.2250	Adder	9.38
963291	AG1-178 C O1	27.9655	Adder	62.08
963351	AG1-184 O1	15.0663	Adder	33.44
963821	AG1-235 C O1	8.6641	Adder	19.23
963822	AG1-235 E O1	5.7760	Adder	12.82
964421	AG1-305 C O1	34.8350	50/50	34.8350
964422	AG1-305 E O1	23.2233	50/50	23.2233
964841	AG1-347 C	3.9547	Adder	8.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964842	AG1-347 E	3.1073	Adder	6.9
964931	AG1-357 C	9.8184	Adder	21.79
964932	AG1-357 E	6.5456	Adder	14.53
964951	AG1-359 O1	9.6382	Adder	21.39
965181	AG1-383 C	0.9905	Adder	2.2
965182	AG1-383 E	0.2934	Adder	0.65
965641	AG1-432 C O1	7.7003	Adder	17.09
965642	AG1-432 E O1	5.1335	Adder	11.4
965811	AG1-449	24.1633	50/50	24.1633
965831	AG1-451	1.2834	Adder	2.85
965971	AG1-466 C	0.6240	Adder	1.39
965972	AG1-466 E	0.4160	Adder	0.92
965981	AG1-467 C	0.6953	Adder	1.54
965982	AG1-467 E	0.4636	Adder	1.03
966001	AG1-469 C	0.7755	Adder	1.72
966002	AG1-469 E	0.5170	Adder	1.15
966361	AG1-505 C	7.6691	Adder	17.02
966362	AG1-505 E	5.1127	Adder	11.35
966371	AG1-506 C	7.6691	Adder	17.02
966372	AG1-506 E	5.1127	Adder	11.35
966501	AG1-519 C	2.4746	50/50	2.4746
966502	AG1-519 E	1.6498	50/50	1.6498
966861	**AG1-557 C O1 (Withdrawn : 12/14/2020)**	**0.7700**	**Adder**	**1.71**
966862	**AG1-557 E O1 (Withdrawn : 12/14/2020)**	**0.5134**	**Adder**	**1.14**
WEC	WEC	0.6016	Confirmed LTF	0.6016
LGEE	LGEE	1.2874	Confirmed LTF	1.2874
CPLE	CPLE	7.2952	Confirmed LTF	7.2952
CBM-W2	CBM-W2	29.3350	Confirmed LTF	29.3350
NY	NY	2.3818	Confirmed LTF	2.3818
TVA	TVA	5.7316	Confirmed LTF	5.7316
O-066	O-066	32.5665	Confirmed LTF	32.5665
SIGE	SIGE	0.7397	Confirmed LTF	0.7397
CBM-S2	CBM-S2	87.8526	Confirmed LTF	87.8526
CBM-S1	CBM-S1	1.4144	Confirmed LTF	1.4144
G-007	G-007	5.1145	Confirmed LTF	5.1145
MEC	MEC	3.7898	Confirmed LTF	3.7898
LAGN	LAGN	7.0595	Confirmed LTF	7.0595
AA2-074	AA2-074	4.8163	LTF	4.8163
CBM-W1	CBM-W1	24.2546	Confirmed LTF	24.2546

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
AA1-139	Hickory-Shawboro 230kV	In Service
AA2-074	CPLE-PJM	Confirmed
AB1-173	Brink-Trego 115kV	Engineering and Procurement
AB2-015	Franklin 115kV	Engineering and Procurement
AB2-025	Sapony 34.5kV	In Service
AB2-026	Powhatan 34.5kV	In Service
AB2-040	Brink 115kV	Engineering and Procurement
AB2-099	Ahoskie 34.5kV	Suspended
AB2-100	Clubhouse-Lakeview 230kV	Partially in Service - Under Construction
AB2-158	Louisa-South Anna 230kV	Under Construction
AB2-160	Reams 115kV	Engineering and Procurement
AB2-161	Waverly #2 DP 115kV	Engineering and Procurement
AC1-027	Pendleton 34.5kV	In Service
AC1-076	Locust Grove-Paytes 115kV	Engineering and Procurement
AC1-086	Thelma 230kV	Active
AC1-120	Mitchell-Mountain Run 115kV	Engineering and Procurement
AC1-121	Mitchell-Mountain Run 115kV	Engineering and Procurement
AC1-158	Spotsylvania 500kV	Partially in Service - Under Construction
AC1-161	Septa 500kV	Engineering and Procurement
AC2-012	Grassfield-Great Bridge 115kV	Active
AC2-078	Disputanta-Waverly 115kV	Engineering and Procurement
AC2-079	Ivor-Oak Ridge 115kV	Engineering and Procurement
AC2-141	Septa 500kV	Active
AC2-165	Bremo-Powhatan 230kV	Engineering and Procurement
AC2-196	Fentress 34.5kV	Engineering and Procurement
AD1-023	Cashie-Trowbridge 230 kV	Active
AD1-033	Fentress-Landstown 230 kV	Engineering and Procurement
AD1-076	Trowbridge 230 kV	Active
AD1-082	Bakers Pond-Ivor 115kV	Engineering and Procurement
AD1-087	Clover-Sedge Hill 230 kV	Active
AD1-088	Briery-Clover 230 kV	Active
AD1-152	Clover-Sedge Hill 230 kV	Active
AD2-051	Earleys – Northampton 230kV	Active
AD2-085	Myrtle-Windsor DP 115kV	Active
AD2-097	Spruance NUG 230kV	In Service
AD2-160	Hickory-Moyock 230kV	Active
AD2-202	Clover-Sedge Hill 230kV	Active
AE1-068	Carson-Rogers Rd 500 kV	Active
AE1-069	Carson-Rogers Road 500 kV	Active

Queue Number	Project Name	Status
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
AE1-149	Disputanta-Poe 115 kV	Active
AE1-154	Louisa-South Anna 230 kV	Engineering and Procurement
AE1-173	Carson-Suffolk 500 kV	Active
AE2-000B	N/A	N/A
AE2-007	Chesapeake 230 kV	Withdrawn
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
AE2-078	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
AE2-134	Locust Grove-Paytes 115 kV	Suspended
AE2-147	Swamp 230 kV	Active
AE2-156	Yadkin 115 kV	Active
AE2-182	Briery-Clover 230 kV	Active
AE2-212	Harrowgate 34 kV	Active
AE2-225	Suffolk 34 kV	Engineering and Procurement
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
AE2-259	Curdsville-Willis Mtn 115 kV	Active
AE2-260	Clubhouse 230 kV	Active
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
AF1-069	Carson-Rogers Rd 500 kV	Active
AF1-079	Louisa-South Anna 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
AF1-292	Fields 34.5kV	Active
AF1-301	Louisa-South Anna 230 kV	Active
AF2-037	Louisa-North Anna 230 kV	Active

Queue Number	Project Name	Status
AF2-042	Clover-Rawlings 500 kV	Active
AF2-043	Suffolk 34.5 kV	Engineering and Procurement
AF2-046	Tunis-Mapleton 115 kV	Active
AF2-047	Creswell-Riders Creek 115 kV	Active
AF2-057	Grassfield 34.5 kV	Active
AF2-063	Louisa-North Anna 230 kV	Active
AF2-076	Suffolk-Nucor Steel 230 kV	Active
AF2-081	Moyock 230 kV	Active
AF2-085	Midlothian 34.5 kV	Engineering and Procurement
AF2-108	Locks 34.5 kV	Active
AF2-110	Suffolk 115 kV	Active
AF2-144	Powhatan 34.5 kV	Active
AF2-244	Powhatan 34.5 kV	Withdrawn
AF2-258	Harrowgate 34.5 kV	Active
AF2-259	Locks 34.5 kV	Active
AF2-266	Clover 230 kV	Active
AF2-299	Fields 34.5 kV	Active
AF2-400	Franklin 13.2 kV	Engineering and Procurement
AG1-000B	N/A	N/A
AG1-008	Tunis-Mapleton 115 kV	Active
AG1-023	North Anna-Louisa 230 kV	Active
AG1-027	Suffolk-Holland 115 kV	Active
AG1-036	Tunis 34.5 kV	Active
AG1-037	Ahoskie 34.5 kV	Active
AG1-075	Purdy-Sapony 115 kV	Active
AG1-081	Poolesville 34.5 kV	Withdrawn
AG1-082	Ahoskie 34.5 kV	Active
AG1-083	Ahoskie 34.5 kV	Active
AG1-084	Earlys 34.5 kV	Active
AG1-085	Earlys 34.5	Active
AG1-098	Briery-Clover 230 kV	Active
AG1-105	Clover-Sedge Hill 230 kV	Active
AG1-106	Thelma 230 kV	Active
AG1-133	North Anna-Ladysmith 500 kV	Active
AG1-153	Heritage 500 kV	Active
AG1-160	Rogers Road 500 kV	Active
AG1-176	Briery-Clover 230 kV	Active
AG1-178	Carson-Septa 500 kV	Active
AG1-179	Brunswick 69 kV	Active
AG1-180	Brunswick 69 kV	Active
AG1-184	Carson-Septa 500 kV	Active
AG1-235	Fentress-Sligo 230 kV	Active
AG1-288	Lake of the Woods DP-Wilderness DP 115 kV	Active
AG1-289	Lake of the Woods DP-Wilderness DP 115 kV	Active
AG1-305	Louisa-North Anna 230 kV	Active
AG1-312	Earleys-Cashie 230 kV	Active
AG1-313	Jackson DP-Occoneechee 115 kV	Active
AG1-343	Boykins-Murphy 115 kV	Active
AG1-347	Briery DP-Clover 230 kV	Active
AG1-357	Clover-Rawlings 500 kV	Active
AG1-359	Fentress 230 kV	Active
AG1-364	Deep Creek 115 kV	Active

Queue Number	Project Name	Status
AG1-383	Hickory 34.5 kV	Active
AG1-394	Boykins 34.5 kV	Active
AG1-428	Danieltown 69 kV	Active
AG1-431	Mackeys 230 kV	Active
AG1-431A	Mackeys 230 kV	Active
AG1-432	Curdsville DP-Willis Mt. 115 kV	Active
AG1-437	Cashie-Earleys 230 kV	Active
AG1-438	Cashie-Earleys 230 kV	Active
AG1-442	Cashie-Earleys 230 kV	Active
AG1-443	Cashie-Earleys 230 kV	Active
AG1-449	Rawlings-Carson 500 kV	Active
AG1-451	Curdsville DP-Willis Mt. 115 kV	Active
AG1-466	Orange 34.5 kV	Active
AG1-467	Somerset 34.5 kV	Active
AG1-469	Gordonsville 34.5 kV	Active
AG1-502	Oak Green 115 kV	Active
AG1-503	Oak Green 115 kV	Active
AG1-505	Rawlings-Clover 500 kV	Active
AG1-506	Rawlings-Clover 500 kV	Active
AG1-518	Suffolk 230 kV	Active
AG1-519	Cash's Corner 230 kV	Active
AG1-532	Fields 34.5 kV	Active
AG1-544	Bakers Pond DP 115 kV	Active
AG1-545	W. Quaker Rd-Disputanta 34.5 kV	Active
AG1-552	Carolina 13.2 kV	Active
AG1-557	Curdsville DP 115 kV	Withdrawn
Z1-068	Birdneck 34.5kV	In Service
Z1-086	Heritage-Carson	In Service

11.8 Contingency Descriptions - Primary POI

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 581	CONTINGENCY 'DVP_P1-2: LN 581' OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 2 /* 3CHANCE 115.00 - 8CHANCE 500.00 OPEN BRANCH FROM BUS 314905 TO BUS 314911 CKT 1 /* 8CHANCE 500.00 - 8LADYSMITH 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
Base Case	
DVP_P4-2: 515T573	CONTINGENCY 'DVP_P4-2: 515T573' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314934 TO BUS 926730 CKT 1 /* 8SPOTSYL 500.00 - AC1-158 MAIN500.00 OPEN BUS 926730 /* ISLAND: AC1-158 MAIN500.00 OPEN BUS 926731 /* ISLAND: AC1-158 COL134.500 OPEN BUS 926732 /* ISLAND: AC1-158 COL234.500 OPEN BUS 926733 /* ISLAND: AC1-158 COL334.500 OPEN BUS 926734 /* ISLAND: AC1-158 COL434.500 OPEN BUS 926735 /* ISLAND: AC1-158 TER113.800 OPEN BUS 926736 /* ISLAND: AC1-158 TER213.800 OPEN BUS 926737 /* ISLAND: AC1-158 C1 0.4400 OPEN BUS 926738 /* ISLAND: AC1-158 C2 0.4400 OPEN BUS 926739 /* ISLAND: AC1-158 E1 0.4400 OPEN BUS 926740 /* ISLAND: AC1-158 E2 0.4400 OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 END
DVP_P1-2: LN 575-A	CONTINGENCY 'DVP_P1-2: LN 575-A' OPEN BRANCH FROM BUS 314911 TO BUS 962840 CKT 1 /* 8LADYSMITH 500.00 - AG1-133 TAP 500.00 END

Contingency Name	Contingency Definition
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 962840 CKT 1 /* 8LADYSMITH 500.00 - AG1-133 TAP 500.00 END
DVP_P4-2: H1T575	CONTINGENCY 'DVP_P4-2: H1T575' /* LADYSMITH 500 KV OPEN BRANCH FROM BUS 314911 TO BUS 962840 CKT 1 /* 8LADYSMITH 500.00 - AG1-133 TAP 500.00 OPEN BRANCH FROM BUS 314196 TO BUS 314911 CKT 1 /* 6LADYSMITH 230.00 - 8LADYSMITH 500.00 END
DVP_P4-2: H1T573	CONTINGENCY 'DVP_P4-2: H1T573' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1 /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00 END

12 Short Circuit Analysis - Primary POI

The following Breakers are overdutied:

None

12.1 System Reinforcements - Short Circuit

None

13 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AG1-133 was evaluated as a 150.0 MW (Capacity 90.0 MW) injection tapping the North Anna to Spotsylvania 500 kV line in the Dominion area. Project AG1-133 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-133 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

13.1 Generation Deliverability

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

None

13.2 Multiple Facility Contingency

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

None

13.3 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
173342453	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P4-2: 515T573	breaker	3938.0	113.3	114.61	DC	103.42
173342454	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P4-2: H1T573	breaker	3938.0	112.78	114.12	DC	103.52
173342694	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 594	single	3218.560058 59	110.06	111.9	DC	59.95
173342696	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 573-B	single	3218.560058 59	110.41	112.28	DC	62.06
163549891	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	123.49	124.23	DC	89.51
163549892	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P4-2: H1T575	breaker	3938.0	118.29	119.09	DC	88.92
163550132	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 552	single	3218.560058 59	134.47	134.63	DC	35.05
163550133	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 581	single	3218.560058 59	133.32	133.45	DC	34.66
173342435	962840	AG1-133 TAP	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	116.88	117.6	DC	93.3
173342436	962840	AG1-133 TAP	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P4-2: H1T575	breaker	3938.0	112.5	113.25	DC	92.79
173342709	962840	AG1-133 TAP	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 581	single	3218.560058 59	130.61	130.74	DC	36.04
173342711	962840	AG1-133 TAP	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 575	single	3218.560058 59	117.17	118.92	DC	55.68

13.4 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
173342822	314911	8LADYSMITH	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1-2: LN 573-B	operation	4070.19995117	104.54	104.84	DC	40.96
163550283	314916	8MORRSVL	500.0	DVP	314913	8LOUDOUN	500.0	DVP	1	DVP_P1-2: LN 580	operation	2738.2199707	105.49	105.99	DC	29.87
173342691	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 573-B	operation	3218.560058 59	137.87	139.51	DC	103.44
163550138	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	Base Case	operation	3218.560058 59	104.27	104.59	DC	51.45
173342650	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 575	operation	3218.560058 59	144.56	145.55	DC	88.93
173342707	962840	AG1-133 TAP	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 575	operation	3218.560058 59	137.45	138.37	DC	92.8

13.5 Flow Gate Details - Secondary POI

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".

13.5.1 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
173342454	314918	8NO ANNA	DVP	314911	8LADYSMITH	DVP	1	DVP_P4-2: H1T573	breaker	3938.0	112.78	114.12	DC	103.52

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313717	6SLIGO L2192	1.4890	Adder	1.75
314466	6FENTRES	1.5031	Adder	1.77
314550	6HICKORY	2.7774	Adder	3.27
315172	1LOISA A	2.7514	50/50	2.7514
315173	1LOISA B	2.7657	50/50	2.7657
315174	1LOISA C	2.7657	50/50	2.7657
315175	1LOISA D	2.7657	50/50	2.7657
315176	1LOISA E	5.6384	50/50	5.6384
315177	1S ANNAG1	2.2031	50/50	2.2031
315178	1S ANNAS1	1.1321	50/50	1.1321
315179	1S ANNAG2	2.2031	50/50	2.2031
315180	1S ANNAS2	1.1321	50/50	1.1321
315225	1N ANNA1	103.2770	50/50	103.2770
315226	1N ANNA2	103.3205	50/50	103.3205
315241	1Z1-086 GT1	10.5278	50/50	10.5278
315242	1Z1-086 GT2	10.5278	50/50	10.5278
315243	1Z1-086 GT3	10.5278	50/50	10.5278
315244	1Z1-086 ST	18.3013	50/50	18.3013
316097	AB2-100 E1	2.0209	Adder	2.38
316099	AB2-100 E2	2.0209	Adder	2.38
916192	Z1-068 E	1.2677	Adder	1.49
919152	AA1-139 E	4.3486	Adder	5.12
923852	AB2-025 E	0.7970	Adder	0.94
923862	AB2-026 E	0.9488	Adder	1.12
925021	AB2-158 C	3.8973	50/50	3.8973
925022	AB2-158 E	11.0149	50/50	11.0149
926754	AC1-161 C	20.5462	Adder	24.17
926755	AC1-161 E	8.7706	Adder	10.32
933294	AC2-141 C	20.5462	Adder	24.17
933295	AC2-141 E	8.7706	Adder	10.32
933501	AC2-165 C	8.3426	Adder	9.81
933502	AC2-165 E	6.2789	Adder	7.39
933732	AC2-196 E	0.8074	Adder	0.95
934061	AD1-033 C	5.0890	Adder	5.99
934062	AD1-033 E	3.3927	Adder	3.99
934615	AD1-087 C	6.1456	Adder	7.23
934616	AD1-087 E	2.6298	Adder	3.09
934625	AD1-088 C	9.5848	Adder	11.28
934626	AD1-088 E	2.5103	Adder	2.95
935171	AD1-152 C O1	6.7504	Adder	7.94
935172	AD1-152 E O1	4.5002	Adder	5.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
937221	AD2-160 C O1	3.9662	Adder	4.67
937222	AD2-160 E O1	2.0798	Adder	2.45
937481	AD2-202 C O1	1.8001	Adder	2.12
937482	AD2-202 E O1	1.0126	Adder	1.19
938494	AE1-068_C1	31.5351	50/50	31.5351
938497	AE1-068_C2	31.5351	50/50	31.5351
938498	AE1-068_E1	17.4324	50/50	17.4324
938499	AE1-068_E2	17.4324	50/50	17.4324
938504	AE1-069_C1	24.0332	50/50	24.0332
938507	AE1-069_C2	25.9136	50/50	25.9136
938508	AE1-069_E1	13.6717	50/50	13.6717
938509	AE1-069_E2	14.7294	50/50	14.7294
938535	AE1-072 C	5.8783	Adder	6.92
938536	AE1-072 E	3.0282	Adder	3.56
938552	AE1-074 E	0.9016	Adder	1.06
938562	AE1-075 E	0.9029	Adder	1.06
939231	AE1-154 C	4.0496	50/50	4.0496
939232	AE1-154 E	2.8347	50/50	2.8347
939414	AE1-173_C1	26.0396	Adder	30.63
939415	AE1-173_C2	22.3196	Adder	26.26
939416	AE1-173_C3	26.0396	Adder	30.63
939423	AE1-173_E1	17.3597	Adder	20.42
939424	AE1-173_E2	14.8798	Adder	17.51
939425	AE1-173_E3	17.3597	Adder	20.42
940471	AE2-031 C	34.4624	50/50	34.4624
940472	AE2-031 E	22.9750	50/50	22.9750
940481	AE2-033 C	11.3702	Adder	13.38
940482	AE2-033 E	7.6653	Adder	9.02
940541	AE2-040	2.0182	Adder	2.37
940641	AE2-051 C O1	17.5950	50/50	17.5950
940642	AE2-051 E O1	11.7300	50/50	11.7300
941031	AE2-094 C	41.3178	50/50	41.3178
941032	AE2-094 E	18.5052	50/50	18.5052
941281	AE2-122 C O1	19.1900	Adder	22.58
941282	AE2-122 E O1	77.4364	Adder	91.1
941291	AE2-123 C O1	19.7214	Adder	23.2
941292	AE2-123 E O1	76.9051	Adder	90.48
941301	AE2-124 C O1	17.9429	Adder	21.11
941302	AE2-124 E O1	78.7312	Adder	92.62
941791	AE2-182 C	1.5572	Adder	1.83
941792	AE2-182 E	0.7249	Adder	0.85
942401	AE2-253 C	4.1718	Adder	4.91
942402	AE2-253 E	1.8743	Adder	2.21
942461	AE2-259 C O1	7.2644	Adder	8.55
942462	AE2-259 E O1	4.8430	Adder	5.7
942471	AE2-260 C O1	10.1864	Adder	11.98
942472	AE2-260 E O1	14.4483	Adder	17.0
942931	AE2-313 C	37.2618	50/50	37.2618
942932	AE2-313 E	24.8412	50/50	24.8412
944011	AF1-069 C	13.5001	50/50	13.5001
944012	AF1-069 E	5.2445	50/50	5.2445
944111	AF1-079 C	7.6942	50/50	7.6942

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944112	AF1-079 E	10.4480	50/50	10.4480
944581	AF1-123 C O1	32.7943	Adder	38.58
944582	AF1-123 E O1	75.0897	Adder	88.34
944591	AF1-124 C O1	32.7943	Adder	38.58
944592	AF1-124 E O1	75.0897	Adder	88.34
944601	AF1-125 C O1	32.7943	Adder	38.58
944602	AF1-125 E O1	75.0897	Adder	88.34
945811	AF1-246 C O1	6.2443	Adder	7.35
945812	AF1-246 E O1	8.6231	Adder	10.14
946011	AF1-266	9.5177	Adder	11.2
946371	AF1-301 C	31.4100	50/50	31.4100
946372	AF1-301 E	21.0778	50/50	21.0778
957431	AF2-037 C	27.7499	50/50	27.7499
957432	AF2-037 E	18.5000	50/50	18.5000
957481	AF2-042 C	44.6020	Adder	52.47
957482	AF2-042 E	29.7347	Adder	34.98
957691	AF2-063 C	44.2818	50/50	44.2818
957692	AF2-063 E	29.5212	50/50	29.5212
957871	AF2-081 C	6.7644	Adder	7.96
957872	AF2-081 E	2.8990	Adder	3.41
957911	AF2-085	4.2006	50/50	4.2006
958501	AF2-144 C	1.5609	Adder	1.84
958502	AF2-144 E	1.0406	Adder	1.22
959531	AF2-244 C (Withdrawn : 01/06/2021)	1.4385	Adder	1.69
959532	AF2-244 E (Withdrawn : 01/06/2021)	0.8570	Adder	1.01
959751	AF2-266	7.0418	Adder	8.28
961811	AG1-023 C	7.7924	50/50	7.7924
961812	AG1-023 E	31.1694	50/50	31.1694
962271	AG1-075 C O2	6.3106	Adder	14.01
962272	AG1-075 E O2	3.8459	Adder	8.54
962441	AG1-093 C O2	6.3425	Adder	14.08
962442	AG1-093 E O2	1.9303	Adder	4.28
962841	AG1-133 C O2	62.1126	50/50	62.1126
962842	AG1-133 E O2	41.4084	50/50	41.4084
963041	AG1-153 C	2.5869	Adder	5.74
963042	AG1-153 E	3.8804	Adder	8.61
963111	AG1-160 C	2.6216	Adder	5.82
963112	AG1-160 E	8.7291	50/50	8.7291
963271	AG1-176 C O2	6.0591	Adder	13.45
963272	AG1-176 E O2	4.0394	Adder	8.97
963291	AG1-178 C O2	64.2601	50/50	64.2601
963351	AG1-184 O2	34.6199	50/50	34.6199
963821	AG1-235 C O2	8.6726	Adder	19.25
963822	AG1-235 E O2	5.7817	Adder	12.83
964241	AG1-285 C O2	5.9777	Adder	13.27
964242	AG1-285 E O2	3.9851	Adder	8.85
964421	AG1-305 C O2	35.2386	50/50	35.2386
964422	AG1-305 E O2	23.4924	50/50	23.4924
964841	AG1-347 C	3.9547	Adder	8.78
964842	AG1-347 E	3.1073	Adder	6.9
964951	AG1-359 O1	9.6382	Adder	21.39

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
965181	AG1-383 C	0.9905	Adder	2.2
965182	AG1-383 E	0.2934	Adder	0.65
965641	AG1-432 C O2	7.7003	Adder	17.09
965642	AG1-432 E O2	5.1335	Adder	11.4
965811	AG1-449	24.1633	50/50	24.1633
965831	AG1-451	1.2834	Adder	2.85
965971	AG1-466 C	0.6240	Adder	1.39
965972	AG1-466 E	0.4160	Adder	0.92
965981	AG1-467 C	0.6953	Adder	1.54
965982	AG1-467 E	0.4636	Adder	1.03
966001	AG1-469 C	0.7755	Adder	1.72
966002	AG1-469 E	0.5170	Adder	1.15
966361	AG1-505 C	7.6691	Adder	17.02
966362	AG1-505 E	5.1127	Adder	11.35
966371	AG1-506 C	7.6691	Adder	17.02
966372	AG1-506 E	5.1127	Adder	11.35
966501	AG1-519 C	2.4746	50/50	2.4746
966502	AG1-519 E	1.6498	50/50	1.6498
WEC	WEC	0.6016	Confirmed LTF	0.6016
LGEE	LGEE	1.2874	Confirmed LTF	1.2874
CPLE	CPLE	7.2952	Confirmed LTF	7.2952
CBM-W2	CBM-W2	29.3350	Confirmed LTF	29.3350
NY	NY	2.3818	Confirmed LTF	2.3818
TVA	TVA	5.7316	Confirmed LTF	5.7316
O-066	O-066	32.5665	Confirmed LTF	32.5665
SIGE	SIGE	0.7397	Confirmed LTF	0.7397
CBM-S2	CBM-S2	87.8526	Confirmed LTF	87.8526
CBM-S1	CBM-S1	1.4144	Confirmed LTF	1.4144
G-007	G-007	5.1145	Confirmed LTF	5.1145
MEC	MEC	3.7898	Confirmed LTF	3.7898
LAGN	LAGN	7.0595	Confirmed LTF	7.0595
AA2-074	AA2-074	4.8163	LTF	4.8163
CBM-W1	CBM-W1	24.2546	Confirmed LTF	24.2546

13.5.2 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
163550132	314934	8SPOTSYL	DVP	314916	8MORRSVL	DVP	1	DVP_P1-2: LN 552	single	3218.56	134.47	134.63	DC	35.05

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314236	6NRTHEST	0.2014	80/20	0.2014
314250	6ROCKVILLE	0.3709	80/20	0.3709
314309	6IRON208	0.4858	80/20	0.4858
314314	3LOCKS	0.3245	80/20	0.3245
315058	**1CHESTF3 (Deactivation : 13/12/2018)**	**17.4462**	**Adder**	**20.52**
315059	**1CHESTF4 (Deactivation : 13/12/2018)**	**28.2804**	**Adder**	**33.27**
315060	**1CHESTF5 (Deactivation : 31/05/2023)**	**60.9577**	**Adder**	**71.71**
315065	**1CHESTF6 (Deactivation : 31/05/2023)**	**139.8920**	**80/20**	**139.8920**
315074	**1HOPCGN1 (Deactivation : 25/06/2019)**	**0.0175**	**Adder**	**0.02**
315075	**1HOPCGN2 (Deactivation : 25/06/2019)**	**0.0175**	**Adder**	**0.02**
315083	**1SPRUNCA (Deactivation : 12/01/2021)**	**12.2861**	**80/20**	**12.2861**
315084	**1SPRUNCB (Deactivation : 12/01/2021)**	**12.2861**	**80/20**	**12.2861**
315098	1CHESPKA	0.4831	80/20	0.4831
315099	**1CHESPKB (Deactivation : 31/05/2019)**	**3.3492**	**80/20**	**3.3492**
315108	1ELIZAR1	3.5490	80/20	3.5490
315109	1ELIZAR2	3.4874	80/20	3.4874
315110	1ELIZAR3	3.5944	80/20	3.5944
315225	1N ANNA1	54.3957	80/20	54.3957
315226	1N ANNA2	54.4186	80/20	54.4186
315233	1SURRY 2	27.4780	80/20	27.4780
316083	AB2-161 C	3.3028	Adder	3.89
316108	AB2-160 C	6.2536	80/20	6.2536
316112	**AB2-068 CT1 (Withdrawn : 01/11/2021)**	**49.0670**	**Adder**	**57.73**
316113	**AB2-068 CT2 (Withdrawn : 01/11/2021)**	**49.0670**	**Adder**	**57.73**
316114	**AB2-068 ST (Withdrawn : 01/11/2021)**	**85.0033**	**Adder**	**100.0**
316132	AB2-190 C	19.5312	Adder	22.98
316134	AC1-107 G1	92.1388	Adder	108.4
316135	AC1-107 G2	92.1388	Adder	108.4
316136	AC1-107 G3	92.1561	Adder	108.42
925021	AB2-158 C	2.0085	80/20	2.0085

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
926001	AC1-076 C	6.0766	80/20	6.0766
926661	AC1-147 C	0.4085	80/20	0.4085
926737	AC1-158 C1	14.5872	80/20	14.5872
926738	AC1-158 C2	14.5872	80/20	14.5872
926754	AC1-161 C	34.9772	80/20	34.9772
932044	AC2-012 C	11.7141	80/20	11.7141
932581	AC2-078 C O1	3.9651	Adder	4.66
932591	AC2-079 C O1	5.5811	Adder	6.57
933294	AC2-141 C	34.9772	80/20	34.9772
934014	AD1-025 C	16.4224	Adder	19.32
934061	AD1-033 C	7.3196	Adder	8.61
934575	AD1-082 C	7.5270	Adder	8.86
935164	AD1-151 C	15.6947	Adder	18.46
936041	AD2-007 C	0.7845	Adder	0.92
936051	AD2-008 C	2.8591	Adder	3.36
936761	AD2-097 C	2.3301	80/20	2.3301
937221	AD2-160 C O1	5.6867	Adder	6.69
938494	AE1-068_C1	27.9735	Adder	32.91
938497	AE1-068_C2	27.9735	Adder	32.91
938504	AE1-069_C1	21.3189	Adder	25.08
938507	AE1-069_C2	22.9869	Adder	27.04
938535	AE1-072 C	9.8267	Adder	11.56
938551	AE1-074 C	0.4570	80/20	0.4570
938634	AE1-085 C	8.6985	Adder	10.23
939195	AE1-149 C	10.4565	Adder	12.3
939231	AE1-154 C	2.0870	80/20	2.0870
939414	AE1-173_C1	35.5051	80/20	35.5051
939415	AE1-173_C2	30.4330	80/20	30.4330
939416	AE1-173_C3	35.5051	80/20	35.5051
939431	AE1-175 C	2.3014	Adder	2.71
940061	AE2-000BC O1	10.4229	Adder	12.26
940251	**AE2-007 O1 (Withdrawn : 12/11/2020)**	**198.9482**	**80/20**	**198.9482**
940431	AE2-027 C O1	14.7982	80/20	14.7982
940471	AE2-031 C	35.9101	80/20	35.9101
940641	AE2-051 C O1	19.2096	80/20	19.2096
940651	AE2-052	3.4855	Adder	4.1
940891	AE2-078 C	2.2968	Adder	2.7
940901	AE2-079 C	2.2968	Adder	2.7
941031	AE2-094 C	43.0189	80/20	43.0189
941281	AE2-122 C O1	27.7126	Adder	32.6
941291	AE2-123 C O1	28.4800	Adder	33.51
941301	AE2-124 C O1	25.8951	Adder	30.46
941381	**AE2-134 (Suspended)**	**4.1872**	**80/20**	**4.1872**
941591	AE2-156 O1	20.5580	80/20	20.5580
942001	AE2-212 C	2.4740	80/20	2.4740
942151	AE2-227 C	2.4800	80/20	2.4800
942161	AE2-228 C	2.4752	80/20	2.4752
942371	AE2-250 C O1	11.1083	80/20	11.1083
942401	AE2-253 C	5.9814	Adder	7.04
942551	AE2-270	26.1541	Adder	30.77
942931	AE2-313 C	38.8349	80/20	38.8349

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943621	AF1-033 C	2.2968	Adder	2.7
944011	AF1-069 C	14.0559	80/20	14.0559
944111	AF1-079 C	3.9653	80/20	3.9653
944581	AF1-123 C O1	55.1157	80/20	55.1157
944591	AF1-124 C O1	55.1157	80/20	55.1157
944601	AF1-125 C O1	55.1157	80/20	55.1157
944631	AF1-128 O1	53.4512	Adder	62.88
944641	AF1-129	117.3847	80/20	117.3847
946261	AF1-291 C	2.4751	80/20	2.4751
946371	AF1-301 C	16.2047	80/20	16.2047
957431	AF2-037 C	14.4361	80/20	14.4361
957631	AF2-057	4.1102	80/20	4.1102
957691	AF2-063 C	23.0364	80/20	23.0364
957711	AF2-065 C	13.3386	Adder	15.69
957871	AF2-081 C	9.6890	Adder	11.4
957911	AF2-085	4.5132	80/20	4.5132
958141	AF2-108	2.0607	80/20	2.0607
959641	AF2-255 C	0.6200	80/20	0.6200
959651	AF2-256 C	0.6188	80/20	0.6188
959661	AF2-257 C	0.6188	80/20	0.6188
959671	AF2-258 C	0.6185	80/20	0.6185
959681	AF2-259 C	3.0911	80/20	3.0911
961711	AG1-011	14.7836	Adder	32.82
961811	AG1-023 C	4.0631	80/20	4.0631
962191	AG1-064 C	1.6663	80/20	1.6663
962201	AG1-065 C	1.6663	80/20	1.6663
962321	**AG1-081 C (Withdrawn : 01/15/2021)**	**1.1067**	**Adder**	**2.46**
962841	AG1-133 C O2	35.0460	80/20	35.0460
962961	AG1-145 C	1.1005	Adder	2.44
963221	AG1-171 C	1.1091	Adder	2.46
963231	AG1-172 C	1.1091	Adder	2.46
963241	AG1-173 C	1.1091	Adder	2.46
963251	AG1-174 C	1.1091	Adder	2.46
963261	AG1-175 C	1.1091	Adder	2.46
963291	AG1-178 C O2	69.3454	80/20	69.3454
963351	AG1-184 O2	37.3596	80/20	37.3596
963821	AG1-235 C O2	12.4627	Adder	27.66
964271	AG1-288 C	32.6436	80/20	32.6436
964281	AG1-289	18.0504	80/20	18.0504
964421	AG1-305 C O2	18.3407	80/20	18.3407
964951	AG1-359 O1	13.8529	Adder	30.75
965001	AG1-364 C O2	8.2204	80/20	8.2204
965181	AG1-383 C	1.4224	Adder	3.16
965811	AG1-449	25.1784	80/20	25.1784
966611	AG1-531 C	3.3154	Adder	7.36
966731	AG1-544 C	3.6006	Adder	7.99
966741	AG1-545 C	1.2003	Adder	2.66
WEC	WEC	0.6801	Confirmed LTF	0.6801
LGEE	LGEE	1.4941	Confirmed LTF	1.4941
CPLE	CPLE	8.4200	Confirmed LTF	8.4200
CBM-W2	CBM-W2	34.2541	Confirmed LTF	34.2541

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
NY	NY	2.8767	Confirmed LTF	2.8767
TVA	TVA	6.7732	Confirmed LTF	6.7732
SIGE	SIGE	0.8682	Confirmed LTF	0.8682
CBM-S2	CBM-S2	102.2389	Confirmed LTF	102.2389
CBM-S1	CBM-S1	1.6686	Confirmed LTF	1.6686
MEC	MEC	4.3539	Confirmed LTF	4.3539
LAGN	LAGN	8.2845	Confirmed LTF	8.2845
AA2-074	AA2-074	5.5593	LTF	5.5593
CBM-W1	CBM-W1	26.9324	Confirmed LTF	26.9324

13.5.3 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
173342709	962840	AG1-133 TAP	DVP	314934	8SPOTSYL	DVP	1	DVP_P1-2: LN 581	single	3218.56	130.61	130.74	DC	36.04

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314236	6NRTHEST	0.2056	80/20	0.2056
314250	6ROCKVILLE	0.3782	80/20	0.3782
314309	6IRON208	0.4958	80/20	0.4958
314314	3LOCKS	0.3313	80/20	0.3313
315058	**1CHESTF3 (Deactivation : 13/12/2018)**	**17.8083**	**Adder**	**20.95**
315059	**1CHESTF4 (Deactivation : 13/12/2018)**	**28.8673**	**Adder**	**33.96**
315060	**1CHESTF5 (Deactivation : 31/05/2023)**	**62.2251**	**Adder**	**73.21**
315065	**1CHESTF6 (Deactivation : 31/05/2023)**	**142.7943**	**80/20**	**142.7943**
315074	**1HOPCGN1 (Deactivation : 25/06/2019)**	**0.0178**	**Adder**	**0.02**
315075	**1HOPCGN2 (Deactivation : 25/06/2019)**	**0.0178**	**Adder**	**0.02**
315083	**1SPRUNCA (Deactivation : 12/01/2021)**	**12.5326**	**80/20**	**12.5326**
315084	**1SPRUNCB (Deactivation : 12/01/2021)**	**12.5326**	**80/20**	**12.5326**
315098	1CHESPKA	0.4933	80/20	0.4933
315099	**1CHESPKB (Deactivation : 31/05/2019)**	**3.4201**	**80/20**	**3.4201**
315108	1ELIZAR1	3.6241	80/20	3.6241
315109	1ELIZAR2	3.5611	80/20	3.5611
315110	1ELIZAR3	3.6705	80/20	3.6705
315225	1N ANNA1	55.8442	80/20	55.8442
315226	1N ANNA2	55.8678	80/20	55.8678
315233	1SURRY 2	28.0583	80/20	28.0583
316083	AB2-161 C	3.3720	Adder	3.97
316108	AB2-160 C	6.3840	80/20	6.3840
316112	**AB2-068 CT1 (Withdrawn : 01/11/2021)**	**50.0808**	**Adder**	**58.92**
316113	**AB2-068 CT2 (Withdrawn : 01/11/2021)**	**50.0808**	**Adder**	**58.92**
316114	**AB2-068 ST (Withdrawn : 01/11/2021)**	**86.7598**	**Adder**	**102.07**
316132	AB2-190 C	19.9396	Adder	23.46
316134	AC1-107 G1	94.0427	Adder	110.64
316135	AC1-107 G2	94.0427	Adder	110.64
316136	AC1-107 G3	94.0603	Adder	110.66
926001	AC1-076 C	-4.5621	Adder	-5.37

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
926661	AC1-147 C	0.4172	80/20	0.4172
926754	AC1-161 C	35.7190	80/20	35.7190
926784	AC1-164 C	38.7897	Adder	45.63
932044	AC2-012 C	11.9620	80/20	11.9620
932581	AC2-078 C O1	4.0481	Adder	4.76
932591	AC2-079 C O1	5.6980	Adder	6.7
933294	AC2-141 C	35.7190	80/20	35.7190
934014	AD1-025 C	16.7659	Adder	19.72
934061	AD1-033 C	7.4742	Adder	8.79
934575	AD1-082 C	7.6845	Adder	9.04
935164	AD1-151 C	16.0229	Adder	18.85
936041	AD2-007 C	0.8009	Adder	0.94
936051	AD2-008 C	2.9189	Adder	3.43
936661	AD2-085 C	3.4088	Adder	4.01
936761	AD2-097 C	2.3769	80/20	2.3769
937221	AD2-160 C O1	5.8068	Adder	6.83
938494	AE1-068_C1	28.5661	Adder	33.61
938497	AE1-068_C2	28.5661	Adder	33.61
938504	AE1-069_C1	21.7705	Adder	25.61
938507	AE1-069_C2	23.4739	Adder	27.62
938535	AE1-072 C	17.4536	Adder	20.53
938551	AE1-074 C	0.4659	80/20	0.4659
938634	AE1-085 C	8.8804	Adder	10.45
939195	AE1-149 C	10.6753	Adder	12.56
939414	AE1-173_C1	36.2645	80/20	36.2645
939415	AE1-173_C2	31.0838	80/20	31.0838
939416	AE1-173_C3	36.2645	80/20	36.2645
939431	AE1-175 C	2.3499	Adder	2.76
940061	AE2-000BC O1	10.6412	Adder	12.52
940251	AE2-007 O1 (Withdrawn : 12/11/2020)	203.1476	80/20	203.1476
940431	AE2-027 C O1	12.8404	Adder	15.11
940471	AE2-031 C	36.6653	80/20	36.6653
940641	AE2-051 C O1	19.6218	80/20	19.6218
940651	AE2-052	3.5584	Adder	4.19
940891	AE2-078 C	2.3452	Adder	2.76
940901	AE2-079 C	2.3452	Adder	2.76
941031	AE2-094 C	43.9347	80/20	43.9347
941101	AE2-104 C O1	3.3145	Adder	3.9
941281	AE2-122 C O1	28.2988	Adder	33.29
941291	AE2-123 C O1	29.0824	Adder	34.21
941301	AE2-124 C O1	26.4416	Adder	31.11
941591	AE2-156 O1	20.9920	80/20	20.9920
942001	AE2-212 C	2.5255	80/20	2.5255
942131	AE2-225 C	2.1139	Adder	2.49
942151	AE2-227 C	2.5310	80/20	2.5310
942161	AE2-228 C	2.5266	80/20	2.5266
942171	AE2-229 C	1.5855	Adder	1.87
942341	AE2-247 C	1.4776	Adder	1.74
942371	AE2-250 C O1	11.3400	80/20	11.3400
942401	AE2-253 C	6.1078	Adder	7.19
942551	AE2-270	26.7010	Adder	31.41

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942931	AE2-313 C	39.6507	80/20	39.6507
943461	AF1-017 C	1.3368	Adder	1.57
943611	AF1-032 C	1.7264	Adder	2.03
943621	AF1-033 C	2.3452	Adder	2.76
944011	AF1-069 C	14.3551	80/20	14.3551
944581	AF1-123 C O1	56.2820	80/20	56.2820
944591	AF1-124 C O1	56.2820	80/20	56.2820
944601	AF1-125 C O1	56.2820	80/20	56.2820
944631	AF1-128 O1	54.5625	Adder	64.19
944641	AF1-129	119.8200	80/20	119.8200
946001	AF1-265	5.8287	Adder	6.86
946261	AF1-291 C	2.5265	80/20	2.5265
957431	AF2-037 C	13.8541	80/20	13.8541
957491	AF2-043 C	2.1139	Adder	2.49
957631	AF2-057	4.1972	80/20	4.1972
957691	AF2-063 C	22.1076	80/20	22.1076
957711	AF2-065 C	13.6175	Adder	16.02
957871	AF2-081 C	9.8937	Adder	11.64
957911	AF2-085	4.5978	80/20	4.5978
958141	AF2-108	2.1036	80/20	2.1036
958161	AF2-110 C	1.3664	Adder	1.61
959641	AF2-255 C	0.6328	80/20	0.6328
959651	AF2-256 C	0.6316	80/20	0.6316
959661	AF2-257 C	0.6316	80/20	0.6316
959671	AF2-258 C	0.6314	80/20	0.6314
959681	AF2-259 C	3.1554	80/20	3.1554
961711	AG1-011	15.0928	Adder	33.5
961811	AG1-023 C	3.9498	80/20	3.9498
962191	AG1-064 C	1.7002	80/20	1.7002
962201	AG1-065 C	1.7002	80/20	1.7002
962321	**AG1-081 C (Withdrawn : 01/15/2021)**	**1.1300**	**Adder**	**2.51**
962841	AG1-133 C O2	36.0396	80/20	36.0396
962961	AG1-145 C	1.1237	Adder	2.49
963111	AG1-160 C	2.7973	Adder	6.21
963221	AG1-171 C	1.1323	Adder	2.51
963231	AG1-172 C	1.1323	Adder	2.51
963241	AG1-173 C	1.1323	Adder	2.51
963251	AG1-174 C	1.1323	Adder	2.51
963261	AG1-175 C	1.1323	Adder	2.51
963291	AG1-178 C O2	70.8337	80/20	70.8337
963351	AG1-184 O2	38.1613	80/20	38.1613
963821	AG1-235 C O2	12.7261	Adder	28.25
964421	AG1-305 C O2	17.6504	80/20	17.6504
964951	AG1-359 O1	14.1462	Adder	31.4
965001	AG1-364 C O2	8.3940	80/20	8.3940
965181	AG1-383 C	1.4525	Adder	3.22
965811	AG1-449	25.7078	80/20	25.7078
966491	AG1-518 O2	4.6622	Adder	10.35
966611	AG1-531 C	3.3855	Adder	7.51
966731	AG1-544 C	3.6759	Adder	8.16
966741	AG1-545 C	1.2254	Adder	2.72

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
WEC	WEC	0.7314	Confirmed LTF	0.7314
LGEE	LGEE	1.5946	Confirmed LTF	1.5946
CPLE	CPLE	8.6009	Confirmed LTF	8.6009
CBM-W2	CBM-W2	35.7952	Confirmed LTF	35.7952
NY	NY	2.7628	Confirmed LTF	2.7628
TVA	TVA	7.0210	Confirmed LTF	7.0210
SIGE	SIGE	0.8629	Confirmed LTF	0.8629
CBM-S2	CBM-S2	104.6401	Confirmed LTF	104.6401
CBM-S1	CBM-S1	1.7347	Confirmed LTF	1.7347
MEC	MEC	4.6176	Confirmed LTF	4.6176
LAGN	LAGN	8.5978	Confirmed LTF	8.5978
AA2-074	AA2-074	5.6795	LTF	5.6795
CBM-W1	CBM-W1	29.2317	Confirmed LTF	29.2317

13.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
DVP_P1-2: LN 552	CONTINGENCY 'DVP_P1-2: LN 552' OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 1 /* 3CHANCE 115.00 - 8CHANCE 500.00 OPEN BRANCH FROM BUS 314900 TO BUS 314905 CKT 1 /* 8BRISTER 500.00 - 8CHANCE 500.00 END
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 580	CONTINGENCY 'DVP_P1-2: LN 580' OPEN BRANCH FROM BUS 235110 TO BUS 314929 CKT 1 /* 01MDWBRK 500.00 - 8FRONT ROYAL500.00 END
DVP_P1-2: LN 581	CONTINGENCY 'DVP_P1-2: LN 581' OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 2 /* 3CHANCE 115.00 - 8CHANCE 500.00 OPEN BRANCH FROM BUS 314905 TO BUS 314911 CKT 1 /* 8CHANCE 500.00 - 8LADYSMITH 500.00 END
DVP_P4-2: 515T573	CONTINGENCY 'DVP_P4-2: 515T573' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314934 TO BUS 926730 CKT 1 /* 8SPOTSYL 500.00 - AC1-158 MAIN500.00 OPEN BUS 926730 /* ISLAND: AC1-158 MAIN500.00 OPEN BUS 926731 /* ISLAND: AC1-158 COL134.500 OPEN BUS 926732 /* ISLAND: AC1-158 COL234.500 OPEN BUS 926733 /* ISLAND: AC1-158 COL334.500 OPEN BUS 926734 /* ISLAND: AC1-158 COL434.500 OPEN BUS 926735 /* ISLAND: AC1-158 TER113.800 OPEN BUS 926736 /* ISLAND: AC1-158 TER213.800 OPEN BUS 926737 /* ISLAND: AC1-158 C1 0.4400 OPEN BUS 926738 /* ISLAND: AC1-158 C2 0.4400 OPEN BUS 926739 /* ISLAND: AC1-158 E1 0.4400 OPEN BUS 926740 /* ISLAND: AC1-158 E2 0.4400 OPEN BRANCH FROM BUS 962840 TO BUS 314934 CKT 1 /* AG1-133 TAP 500.00 - 8SPOTSYL 500.00 END
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

Contingency Name	Contingency Definition
DVP_P1-2: LN 573-B	CONTINGENCY 'DVP_P1-2: LN 573-B' OPEN BRANCH FROM BUS 962840 TO BUS 314934 CKT 1 /* AG1-133 TAP 500.00 - 8SPOTSYL 500.00 END
Base Case	
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: 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
DVP_P4-2: H1T573	CONTINGENCY 'DVP_P4-2: H1T573' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 962840 TO BUS 314934 CKT 1 /* AG1-133 TAP 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1 /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00 END

14 Affected Systems

14.1 TVA

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

14.2 Duke Energy Progress

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

15 Attachment 1: One Line Diagram