Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-412

LADYSMITH CT-MINE ROAD 230 KV

80 MW Capacity / 200 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.

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 Storage generating facility located in Caroline County, Virginia. The installed facilities will have a total capability of 200 MW with 80 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	**AG1-412**
Project Name	LADYSMITH CT-MINE ROAD 230 KV
State	Virginia
County	Caroline
Transmission Owner	Dominion
MFO	200
MWE	200
MWC	80
Fuel	Storage
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

AG1-412 "Ladysmith CT-Mine Road 230 kV" will interconnect with the Dominion transmission system. The primary POI will be a newly constructed 230 kV three breaker ring bus located on the line between the Ladysmith CT substation and Mine Road 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

There is no secondary point of interconnection specified for AG1-412.

5 Cost Summary

The AG1-412 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$10,400,000
Total System Network Upgrade Costs	$67,257,500[1]
Total Costs	$77,657,500

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.

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

[1] This project currently causes and/or 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.

6 Transmission Owner Scope of Work

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of AG1-412 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	$2,100,000
230 kV Three Breaker Ring-Bus Substation	$6,500,000
Re-arrange line and tie-in new substation	$1,800,000
Total Physical Interconnection Costs	$10,400,000

AG1-412 "Ladysmith CT-Mine Road 230 kV" will interconnect with the Dominion transmission system. The primary POI will be a newly constructed 230 kV three breaker ring bus located on the line between the Ladysmith CT substation and Mine Road 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.

The estiamted schedule for the required Network Impact Reinforcements is identified in the “System Reinforcements” section of this report.

These scheuldes will be more cleary idetnifed in future study phases.

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.

8 Transmission Owner Analysis

Dominion assessed the impact of the proposed AG1-412 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.

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).

1. 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.

2. 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.

3. 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 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

The Queue Project AG1-412 was evaluated as a 200.0 MW (Capacity 80.0 MW) injection tapping the Ladysmith to Summit 230 kV line in the Dominion area. Project AG1-412 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-412 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
163811346	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P7-1: LN 569-2030-A	tower	3144.0	99.92	100.37	DC	29.9

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
168814632	314105	6AQUIA	230.0	DVP	314186	6FULLER ROAD	230.0	DVP	1	DVP_P1-2: LN 2089	single	678.679992676	113.92	117.65	DC	30.25
168814634	314105	6AQUIA	230.0	DVP	314186	6FULLER ROAD	230.0	DVP	1	DVP_P1-2: LN 568	single	678.679992676	101.37	103.27	DC	16.12
168814490	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	DVP_P1-2: LN 2089	single	678.679992676	139.29	143.02	DC	30.25
168814492	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	DVP_P1-2: LN 568	single	678.679992676	126.74	128.64	DC	16.12
168814494	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	Base Case	single	678.679992676	102.78	104.53	DC	15.2
168814734	314137	6FREDBRG	230.0	DVP	314134	6CRANES	230.0	DVP	1	DVP_P1-2: LN 2089	single	984.179992676	102.13	104.7	DC	30.25
168814563	314142	6STAFORD	230.0	DVP	314145	6AQUI_HARB_B	230.0	DVP	1	DVP_P1-2: LN 2089	single	678.679992676	124.11	127.84	DC	30.25
168814565	314142	6STAFORD	230.0	DVP	314145	6AQUI_HARB_B	230.0	DVP	1	DVP_P1-2: LN 568	single	678.679992676	111.57	113.46	DC	16.12
168814615	314144	6AQUI_HARB_A	230.0	DVP	314105	6AQUIA	230.0	DVP	1	DVP_P1-2: LN 2089	single	678.679992676	118.0	121.73	DC	30.25
168814617	314144	6AQUI_HARB_A	230.0	DVP	314105	6AQUIA	230.0	DVP	1	DVP_P1-2: LN 568	single	678.679992676	105.45	107.35	DC	16.12
168814642	314186	6FULLER ROAD	230.0	DVP	314074	6POSSUM	230.0	DVP	1	DVP_P1-2: LN 2089	single	678.679992676	112.87	116.6	DC	30.25
168814644	314186	6FULLER ROAD	230.0	DVP	314074	6POSSUM	230.0	DVP	1	DVP_P1-2: LN 568	single	678.679992676	100.34	102.24	DC	16.12
168814559	314197	6LDYSMITH CT	230.0	DVP	314196	6LADYSMITH	230.0	DVP	1	3142226HANOVER 230 939750 AE1-206 TAP 230 1	single	1151.5	138.08	141.64	DC	53.29

168814561	314197	6LDYSMITH CT	230.0	DVP	314196	6LADYSMITH	230.0	DVP	1	3142126FOUR RIVERS 230 939750 AE1-206 TAP 230 1	single	1151.5	117.56	121.12	DC	53.29
168814475	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	Base Case	single	1123.30004883	100.55	101.7	DC	12.9
163810566	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P4-2: 541T569	breaker	3144.0	101.56	101.73	DC	38.3
168814460	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	Base Case	single	1103.56005859	108.21	109.38	DC	12.9

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
168509971	313810	6DAHLGREN	230.0	DVP	957190	AF2-013 TAP	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	559.299987793	95.41	101.58	DC	34.54
168509934	313837	6SUMMIT	230.0	DVP	314138	6MINE RD	230.0	DVP	1	DVP_P1-2: LN 2089	operation	1151.5	100.96	109.61	DC	112.9
168814631	314105	6AQUIA	230.0	DVP	314186	6FULLER ROAD	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	125.66	135.41	DC	75.62
168814769	314131	6ARNOLDS	230.0	DVP	314175	6COMORN	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	559.299987793	99.52	105.69	DC	34.55
168814576	314132	6BIRCHWD	230.0	DVP	314163	6FINES	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	548.020019531	137.11	143.42	DC	34.55
168814489	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	150.97	160.72	DC	75.62
168814493	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	Base Case	operation	678.679992676	109.7	115.14	DC	38.01
168814733	314137	6FREDBRG	230.0	DVP	314134	6CRANES	230.0	DVP	1	DVP_P1-2: LN 2089	operation	984.179992676	110.18	116.91	DC	75.62
168814787	314138	6MINE RD	230.0	DVP	314137	6FREDBRG	230.0	DVP	1	DVP_P1-2: LN 2089	operation	1123.30004883	95.27	104.14	DC	112.9
168814783	314140	6GARSVL	230.0	DVP	314144	6AQUI_HARB_A	230.0	DVP	1	DVP_P1-2: LN 2089	operation	898.640014648	97.98	105.35	DC	75.62
168814562	314142	6STAFORD	230.0	DVP	314145	6AQUI_HARB_B	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	135.86	145.61	DC	75.62

168814566	314142	6STAFORD	230.0	DVP	314145	6AQUI_HARB_B	230.0	DVP	1	Base Case	operation	678.679992676	94.58	100.02	DC	38.01
168814614	314144	6AQUI_HARB_A	230.0	DVP	314105	6AQUIA	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	129.74	139.5	DC	75.62
168814753	314145	6AQUI_HARB_B	230.0	DVP	314140	6GARSVL	230.0	DVP	1	DVP_P1-2: LN 2089	operation	898.640014648	102.6	109.97	DC	75.62
168814597	314163	6FINES	230.0	DVP	314137	6FREDBRG	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	548.020019531	133.34	139.64	DC	34.55
168814761	314175	6COMORN	230.0	DVP	314132	6BIRCHWD	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	548.020019531	100.38	106.68	DC	34.55
168814641	314186	6FULLER ROAD	230.0	DVP	314074	6POSSUM	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	124.61	134.37	DC	75.62
168814558	314197	6LDYSMITH CT	230.0	DVP	314196	6LADYSMITH	230.0	DVP	1	3142226HANOVER 230 939750 AE1-206 TAP 2301	operation	1151.5	141.03	144.26	DC	133.22
168814708	314197	6LDYSMITH CT	230.0	DVP	965440	AG1-412 TAP	230.0	DVP	1	3142226HANOVER 230 939750 AE1-206 TAP 2301	operation	1123.30004883	110.37	122.09	DC	135.16
168814679	314212	6FOUR RIVERS	230.0	DVP	314150	6STJOHN	230.0	DVP	1	DVP_P1-2: LN 574	operation	1123.30004883	124.34	127.6	DC	36.59
168814474	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	Base Case	operation	1123.30004883	110.28	111.51	DC	32.26
163810898	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1-2: LN 594	operation	4070.19995117	103.45	103.5	DC	41.16
163810702	314911	8LADYSMITH	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1-2: LN 581	operation	2442.12011719	158.61	158.66	DC	33.36
163810885	314911	8LADYSMITH	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1-2: LN 573	operation	4070.19995117	105.42	105.55	DC	42.42
163810873	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P1-2: LN 569	operation	2686.52001953	114.07	114.58	DC	29.33
168814459	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	Base Case	operation	1103.56005859	118.12	119.37	DC	32.26
169737262	944490	AF1-114 TAP	230.0	DVP	313810	6DAHLGREN	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	571.520019531	99.77	105.81	DC	34.54
170021329	957190	AF2-013 TAP	230.0	DVP	314131	6ARNOLDS	230.0	DVP	1	DVP_P1-2: LN 2090-B	operation	559.299987793	102.61	108.79	DC	34.54
170021310	965440	AG1-412 TAP	230.0	DVP	313837	6SUMMIT	230.0	DVP	1	DVP_P1-2: LN 2089	operation	1123.30004883	106.57	115.44	DC	112.9

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
168814460	10	AE1-206 TAP 230.0 kV - 6HANOVER 230.0 kV Ckt 1	DVP n6158 (1050) : Rebuild 3.37 miles of 230 kV Line 2032 from AE1-206 Tap to Hanover with 2-768.2 ACSS 200C. Project Type : FAC Cost : $5,055,000 Time Estimate : 30-36 Months	$5,055,000
168814490,168814492,168814494	3	6CRANES 230.0 kV - 6STAFORD 230.0 kV Ckt 1	DVP n6131 (1038) : Rebuild 7.62 miles of 230 kV Line 2104 from Cranes Corner to Stafford with 2-636 ACSR. Project Type : FAC Cost : $11,430,000 Time Estimate : 30-36 Months	$11,430,000
168814563,168814565	5	6STAFORD 230.0 kV - 6AQUI_HARB_B 230.0 kV Ckt 1	DVP n6382 (919) : Rebuild 0.32 miles of 230 kV Line2104 from Stafford to Aquia Harbor with 2-636 ACSR. Project Type : FAC Cost : $500,000 Time Estimate : 30-36 Months	$500,000
168814642,168814644	7	6FULLER ROAD 230.0 kV - 6POSSUM 230.0 kV Ckt 1	DVP dom-290 (1166) : Rebuild 3.41 mi miles of 230 kV Line 252 from Fuller Road to Possum Point with 2-636 ACSR (24/7) 150 C. Replace wave trap at Possum Point terminal. Project Type : FAC Cost : $8,725,000 Time Estimate : 30-36 Months	$8,725,000
163811346,163810566	1	8OX 500.0 kV - 8CLIFTON 500.0 kV Ckt 1	DVP n6161 (1053) : Replace Wave traps at Ox and Clifton 500 kV substations. Project Type : FAC Cost : $300,000 Time Estimate : 16-18 Months	$300,000
168814475	9	6HANOVER 230.0 kV - 6ELMONT 230.0 kV Ckt 1	DVP n6159 (1051) : Rebuild 3.19 miles of 230 kV Line 2032 from Hanover to Elmont with 2-768.2 ACSS 200C. Project Type : FAC Cost : $4,785,000 Time Estimate : 30-36 Months	$4,785,000

168814559,168814561	8	**6LDYSMITH CT 230.0 kV - 6LADYSMITH 230.0 kV Ckt 1**	**DVP** **b3027.1 (814) : PJM baseline upgrade b3027.1: Add a 2nd 500/230 kV 840 MVA transformer at Dominions Ladysmith Substation. The baseline project has an projected in-service date of 06/01/2021.** **Project Type : CON** **Cost : $0** **Time Estimate : N/A Months** **b3027.2 (815) : PJM Baseline Upgrade b3027.2. Re-conductor Line #2089 between Ladysmith and Ladysmith CT Substations to increase the line rating from 1047 MVA to 1225 MVA. The baseline project has an projected in-service date of 06/01/2021.** **Project Type : FAC** **Cost : $0** **Time Estimate : N/A Months** **dom-249 (1125) : Install a second 230 kV circuit of 3.94 miles from Ladysmith to Ladysmith CT (Line 2089) with a 2000/2000/2300 MVA conductor. Add Breakers at both stations.** **Project Type : CON** **Cost : $8,310,000** **Time Estimate : 30-36 Months**	$8,310,000
168814634,168814632	2	**6AQUIA 230.0 kV - 6FULLER ROAD 230.0 kV Ckt 1**	**DVP** **dom-280 (1156) : Rebuild 4.7 miles of 230 kV Line 252 from Aquia to Fuller Road with 2-636 ACSR (24/7) 150 C. Replace Line lead at Aquia terminal.** **Project Type : FAC** **Cost : $11,750,000** **Time Estimate : 30-36 Months**	$11,750,000
168814617,168814615	6	**6AQUI_HARB_A 230.0 kV - 6AQUIA 230.0 kV Ckt 1**	**DVP** **dom-284 (1160) : Rebuild 3.745 miles of 230 kV Line 252 from Aquia to Aquia Harbor with 2-636 ACSR (24/7) 150 C. Replace Line lead at Aquia terminal and wave trap at Aquia Harbor terminal.** **Project Type : FAC** **Cost : $9,562,500** **Time Estimate : 30-36 Months**	$9,562,500
168814734	4	**6FREDBRG 230.0 kV - 6CRANES 230.0 kV Ckt 1**	**DVP** **dom-283 (1159) : Rebuild 4.56 miles of 230 kV Line 2157 from Fredericksburg to Cranes Corner with 2-795 ACSR 150 C.** **Project Type : FAC** **Cost : $6,840,000** **Time Estimate : 30-36 Months**	$6,840,000
			TOTAL COST	**$67,257,500**

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
163810566	314919	8OX	DVP	314904	8CLIFTON	DVP	1	DVP_P4-2: 541T569	breaker	3144.0	101.56	101.73	DC	38.3

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314134	6CRANES	0.0561	50/50	0.0561
314142	6STAFORD	0.1008	Adder	0.12
314177	3HAYES89	0.0414	Adder	0.05
314189	6PAPERMILL	5.0644	Adder	5.96
315007	**1POSSM 5 (Deactivation : 31/05/2021)**	**108.3021**	**Adder**	**127.41**
315033	1BIRCHWDA	35.9163	Adder	42.25
315037	1LDYSMT1	5.0986	50/50	5.0986
315038	1LDYSMT2	5.0986	50/50	5.0986
315039	1LDYSMT3	4.9082	50/50	4.9082
315040	1LDYSMT4	4.9174	50/50	4.9174
315041	1LDYSMT5	4.9328	50/50	4.9328
315058	**1CHESTF3 (Deactivation : 13/12/2018)**	**13.6425**	**Adder**	**16.05**
315059	**1CHESTF4 (Deactivation : 13/12/2018)**	**22.1145**	**Adder**	**26.02**
315060	**1CHESTF5 (Deactivation : 31/05/2023)**	**47.6863**	**Adder**	**56.1**
315065	**1CHESTF6 (Deactivation : 31/05/2023)**	**91.0573**	**Adder**	**107.13**
315073	1STONECA	5.1509	Adder	6.06
315074	**1HOPCGN1 (Deactivation : 25/06/2019)**	**0.0134**	**Adder**	**0.02**
315075	**1HOPCGN2 (Deactivation : 25/06/2019)**	**0.0134**	**Adder**	**0.02**
315083	**1SPRUNCA (Deactivation : 12/01/2021)**	**7.9319**	**Adder**	**9.33**
315084	**1SPRUNCB (Deactivation : 12/01/2021)**	**7.9319**	**Adder**	**9.33**
315225	1N ANNA1	30.8147	50/50	30.8147
315226	1N ANNA2	30.8277	50/50	30.8277
316076	AC2-137 E	1.0174	Adder	1.2
316078	AC2-138 E	0.7898	Adder	0.93
316108	**AB2-160 C (Suspended)**	**4.0303**	**Adder**	**4.74**
316109	**AB2-160 E (Suspended)**	**6.5757**	**Adder**	**7.74**
316112	**AB2-068 CT1 (Withdrawn : 01/11/2021)**	**39.1382**	**Adder**	**46.04**
316113	**AB2-068 CT2 (Withdrawn : 01/11/2021)**	**39.1382**	**Adder**	**46.04**
316114	**AB2-068 ST (Withdrawn : 01/11/2021)**	**67.8028**	**Adder**	**79.77**
316132	AB2-190 C	14.8712	Adder	17.5

316134	AC1-107 G1	73.4943	Adder	86.46
316135	AC1-107 G2	73.4943	Adder	86.46
316136	AC1-107 G3	73.5081	Adder	86.48
316157	AD2-030 E	0.9163	Adder	1.08
919952	AA2-079 E	3.9372	Adder	4.63
923842	AB2-024 E	0.8487	Adder	1.0
923892	AB2-029 E	1.6532	Adder	1.94
924814	AB2-134 E	9.3496	Adder	11.0
925022	AB2-158 E	3.9732	Adder	4.67
925332	AB2-190 E	6.3734	Adder	7.5
925671	**AC1-043 C (Suspended)**	**5.5789**	**Adder**	**6.56**
925672	**AC1-043 E (Suspended)**	**9.1023**	**Adder**	**10.71**
925863	AC1-065 C	5.7178	Adder	6.73
925865	AC1-065 E	4.2405	Adder	4.99
926001	AC1-076 C	4.5653	50/50	4.5653
926002	AC1-076 E	7.4234	50/50	7.4234
926412	AC1-112 E	0.8483	Adder	1.0
926472	AC1-118 E	0.9757	Adder	1.15
926481	AC1-120 C O1	7.0508	50/50	7.0508
926482	AC1-120 E O1	3.6322	50/50	3.6322
926501	AC1-121 C O1	2.4215	50/50	2.4215
926502	AC1-121 E O1	1.1395	50/50	1.1395
926611	AC1-143 C O1	5.6795	Adder	6.68
926612	AC1-143 E O1	2.5916	Adder	3.05
926737	AC1-158 C1	5.9019	50/50	5.9019
926738	AC1-158 C2	5.9019	50/50	5.9019
926739	AC1-158 E1	16.4166	50/50	16.4166
926740	AC1-158 E2	16.4166	50/50	16.4166
926784	AC1-164 C	30.2709	Adder	35.61
926785	AC1-164 E	13.6000	Adder	16.0
927044	AC1-191 C	7.5207	Adder	8.85
927045	AC1-191 E	3.7463	Adder	4.41
927226	AC1-216 E	5.7077	Adder	6.71
930122	AB1-027 E	0.8344	Adder	0.98
932502	AC2-070 E	0.5284	Adder	0.62
934014	AD1-025 C	12.4749	Adder	14.68
934015	AD1-025 E	7.3896	Adder	8.69
934141	AD1-041 C	4.1032	Adder	4.83
934142	AD1-041 E	2.7355	Adder	3.22
934392	AD1-063 E	0.8210	Adder	0.97
934781	AD1-105 C	6.5021	Adder	7.65
934782	AD1-105 E	4.5184	Adder	5.32
934861	AD1-115 C	2.7894	Adder	3.28
934862	AD1-115 E	4.5512	Adder	5.35
935164	AD1-151 C	11.9501	Adder	14.06
935165	AD1-151 E	7.9667	Adder	9.37
936041	AD2-007 C	0.5959	Adder	0.7
936042	AD2-007 E	0.4105	Adder	0.48
936051	AD2-008 C	2.1719	Adder	2.56
936052	AD2-008 E	4.7278	Adder	5.56
936581	AD2-073 C	1.8968	Adder	2.23
936582	AD2-073 E	0.9398	Adder	1.11
936591	AD2-074 C	4.5556	Adder	5.36

936592	AD2-074 E	7.4328	Adder	8.74
936761	AD2-097 C	1.5043	Adder	1.77
936762	AD2-097 E	7.5216	Adder	8.85
938291	AE1-044 C O1	20.2515	50/50	20.2515
938292	AE1-044 E O1	15.9765	50/50	15.9765
938295	AE1-044 C	20.2877	50/50	20.2877
938296	AE1-044 E	15.9403	50/50	15.9403
938552	AE1-074 E	0.9197	Adder	1.08
938962	AE1-124 E	0.9723	Adder	1.14
939231	AE1-154 C	1.4607	Adder	1.72
939232	AE1-154 E	1.0225	Adder	1.2
939245	AE1-155 C	10.6241	Adder	12.5
939246	AE1-155 E	7.1293	Adder	8.39
939261	AE1-157 C O1	14.6575	50/50	14.6575
939262	AE1-157 E O1	7.9505	50/50	7.9505
939271	AE1-158 C O1	14.9590	50/50	14.9590
939272	AE1-158 E O1	7.6490	50/50	7.6490
939431	AE1-175 C	1.7845	Adder	2.1
939432	AE1-175 E	0.8855	Adder	1.04
939611	AE1-191 C	8.2064	Adder	9.65
939612	AE1-191 E	5.4709	Adder	6.44
939755	AE1-206 C	24.8767	Adder	29.27
939756	AE1-206 E	16.5844	Adder	19.51
940231	AE2-005 C	1.0396	Adder	1.22
940232	AE2-005 E	1.6962	Adder	2.0
940431	AE2-027 C O1	9.6543	Adder	11.36
940432	AE2-027 E O1	6.4362	Adder	7.57
940551	AE2-041	5.4737	Adder	6.44
940901	AE2-079 C	1.3276	Adder	1.56
940902	AE2-079 E	0.6839	Adder	0.8
941381	**AE2-134 (Suspended)**	**3.1458**	**50/50**	**3.1458**
941582	AE2-155 E	0.2086	Adder	0.25
942001	AE2-212 C	1.5909	Adder	1.87
942002	AE2-212 E	1.0606	Adder	1.25
942151	AE2-227 C	1.6453	Adder	1.94
942152	AE2-227 E	1.0968	Adder	1.29
942161	AE2-228 C	1.6061	Adder	1.89
942162	AE2-228 E	1.0707	Adder	1.26
942191	AE2-231 C O1	4.8777	50/50	4.8777
942192	AE2-231 E O1	3.2518	50/50	3.2518
942371	AE2-250 C O1	7.1590	Adder	8.42
942372	AE2-250 E O1	3.7784	Adder	4.45
942551	AE2-270	19.8875	Adder	23.4
943431	AF1-014 C	0.9849	Adder	1.16
943432	AF1-014 E	1.7372	Adder	2.04
943471	AF1-018	5.4737	Adder	6.44
943601	AF1-031 C	8.6861	Adder	10.22
943602	AF1-031 E	4.6959	Adder	5.52
943621	AF1-033 C	1.7321	Adder	2.04
943622	AF1-033 E	0.8923	Adder	1.05
943741	AF1-042 C	2.3837	Adder	2.8
943742	AF1-042 E	3.8893	Adder	4.58
943991	AF1-067 C	4.2937	Adder	5.05

943992	AF1-067 E	2.8625	Adder	3.37
944111	AF1-079 C	2.7754	Adder	3.27
944112	AF1-079 E	3.7687	Adder	4.43
944491	AF1-114 C	6.1340	Adder	7.22
944492	AF1-114 E	8.4707	Adder	9.97
944631	AF1-128 O1	41.8141	Adder	49.19
944641	AF1-129	76.4070	Adder	89.89
945361	AF1-201 C O1	12.0449	Adder	14.17
945362	AF1-201 E O1	8.0300	Adder	9.45
946001	AF1-265	21.8216	Adder	25.67
946261	AF1-291 C	1.6062	Adder	1.89
946262	AF1-291 E	1.0708	Adder	1.26
946371	AF1-301 C	11.1661	Adder	13.14
946372	AF1-301 E	7.4930	Adder	8.82
957191	AF2-013	14.8673	Adder	17.49
957411	AF2-035 C	8.8685	50/50	8.8685
957412	AF2-035 E	5.9123	50/50	5.9123
957431	AF2-037 C	10.2789	50/50	10.2789
957432	AF2-037 E	6.8526	50/50	6.8526
957551	AF2-049 C	6.4998	50/50	6.4998
957552	AF2-049 E	4.8042	50/50	4.8042
957601	AF2-054 C	1.6330	Adder	1.92
957602	AF2-054 E	1.0886	Adder	1.28
957691	AF2-063 C	16.4025	50/50	16.4025
957692	AF2-063 E	10.9350	50/50	10.9350
957711	AF2-065 C	10.1426	Adder	11.93
957712	AF2-065 E	9.7449	Adder	11.46
957831	AF2-077 C	1.6143	Adder	1.9
957832	AF2-077 E	1.0762	Adder	1.27
957911	AF2-085	2.7345	Adder	3.22
957971	AF2-091 C	2.0856	Adder	2.45
957972	AF2-091 E	2.8800	Adder	3.39
958261	AF2-120 C	5.1996	Adder	6.12
958262	AF2-120 E	3.4664	Adder	4.08
959641	AF2-255 C	0.4113	Adder	0.48
959642	AF2-255 E	0.2742	Adder	0.32
959651	AF2-256 C	0.4015	Adder	0.47
959652	AF2-256 E	0.2677	Adder	0.31
959661	AF2-257 C	0.4015	Adder	0.47
959662	AF2-257 E	0.2677	Adder	0.31
959671	AF2-258 C	0.3977	Adder	0.47
959672	AF2-258 E	0.2651	Adder	0.31
960091	AF2-300 C	2.2171	50/50	2.2171
960092	AF2-300 E	1.4781	50/50	1.4781
961101	AF2-401 C	0.5036	Adder	0.59
961102	AF2-401 E	0.8345	Adder	0.98
961611	AG1-000B C	6.1954	Adder	13.75
961711	AG1-011	11.2301	Adder	24.93
961781	AG1-019	7.8797	Adder	17.49
961811	AG1-023 C	2.7830	50/50	2.7830
961812	AG1-023 E	11.1318	50/50	11.1318
961951	AG1-038 C	1.3964	Adder	3.1
961952	AG1-038 E	1.9283	Adder	4.28

962131	AG1-057	1.4505	Adder	3.22
962191	AG1-064 C	0.5845	Adder	1.3
962192	AG1-064 E	0.8110	Adder	1.8
962201	AG1-065 C	0.5845	Adder	1.3
962202	AG1-065 E	0.8110	Adder	1.8
962271	AG1-075 C O1	6.5486	Adder	14.54
962272	AG1-075 E O1	3.9910	Adder	8.86
962321	**AG1-081 C (Withdrawn : 01/15/2021)**	**0.8346**	**Adder**	**1.85**
962322	**AG1-081 E (Withdrawn : 01/15/2021)**	**0.5564**	**Adder**	**1.24**
962531	AG1-102 C	0.4392	Adder	0.97
962532	AG1-102 E	0.9154	Adder	2.03
962533	AG1-102 BAT	0.0071	Adder	0.02
962841	AG1-133 C O1	18.7542	50/50	18.7542
962842	AG1-133 E O1	12.5028	50/50	12.5028
962851	AG1-134 C	4.5513	Adder	10.1
962852	AG1-134 E	3.0342	Adder	6.74
962861	AG1-135 C	2.6640	Adder	5.91
962862	AG1-135 E	1.7760	Adder	3.94
962961	AG1-145 C	0.8533	Adder	1.89
962962	AG1-145 E	0.5689	Adder	1.26
962971	AG1-146 C	1.3227	Adder	2.94
962972	AG1-146 E	0.8818	Adder	1.96
962981	AG1-147 C	3.0864	Adder	6.85
962982	AG1-147 E	2.0576	Adder	4.57
963031	AG1-152 C	2.7899	Adder	6.19
963032	AG1-152 E	4.1848	Adder	9.29
963051	AG1-154 C	3.8936	50/50	3.8936
963052	AG1-154 E	5.8404	50/50	5.8404
963221	AG1-171 C	0.8445	Adder	1.87
963222	AG1-171 E	0.5630	Adder	1.25
963231	AG1-172 C	0.8445	Adder	1.87
963232	AG1-172 E	0.5630	Adder	1.25
963241	AG1-173 C	0.8445	Adder	1.87
963242	AG1-173 E	0.5630	Adder	1.25
963251	AG1-174 C	0.8445	Adder	1.87
963252	AG1-174 E	0.5630	Adder	1.25
963261	AG1-175 C	0.8445	Adder	1.87
963262	AG1-175 E	0.5630	Adder	1.25
963341	AG1-183 C	6.5627	50/50	6.5627
963381	AG1-187	2.6753	50/50	2.6753
963611	AG1-210 C	0.2990	Adder	0.66
963612	AG1-210 E	0.4485	Adder	1.0
963621	AG1-213 C	0.7390	50/50	0.7390
963622	AG1-213 E	1.1086	50/50	1.1086
964021	AG1-256 C	0.6009	Adder	1.33
964022	AG1-256 E	0.9014	Adder	2.0
964211	AG1-282 C	0.8942	Adder	1.98
964212	AG1-282 E	0.5961	Adder	1.32
964271	AG1-288 C	19.7623	50/50	19.7623
964281	AG1-289	10.9277	50/50	10.9277
964421	AG1-305 C O1	12.9033	50/50	12.9033
964422	AG1-305 E O1	8.6022	50/50	8.6022

964591	AG1-322 O1	5.5987	Adder	12.43
964811	AG1-344 C	0.9151	Adder	2.03
964812	AG1-344 E	0.6100	Adder	1.35
965231	AG1-388 C	0.8942	Adder	1.98
965232	AG1-388 E	0.5961	Adder	1.32
965441	AG1-412 C	15.3208	50/50	15.3208
965442	AG1-412 E	22.9812	50/50	22.9812
965971	AG1-466 C	0.5985	Adder	1.33
965972	AG1-466 E	0.3990	Adder	0.89
965981	AG1-467 C	0.6669	Adder	1.48
965982	AG1-467 E	0.4446	Adder	0.99
966001	AG1-469 C	0.6533	Adder	1.45
966002	AG1-469 E	0.4355	Adder	0.97
966331	AG1-502 C	8.5685	50/50	8.5685
966332	AG1-502 E	5.7123	50/50	5.7123
966341	AG1-503 C	2.1421	50/50	2.1421
966342	AG1-503 E	1.4281	50/50	1.4281
966611	AG1-531 C	2.5128	Adder	5.58
966612	AG1-531 E	1.6752	Adder	3.72
966661	AG1-536 C	2.3709	Adder	5.26
966662	AG1-536 E	3.1858	Adder	7.07
966711	AG1-541 C	5.9123	50/50	5.9123
966712	AG1-541 E	7.9447	50/50	7.9447
966871	AG1-558 C	0.8957	Adder	1.99
966872	AG1-558 E	0.5971	Adder	1.33
966881	AG1-559 C	2.2171	50/50	2.2171
966882	AG1-559 E	1.4781	50/50	1.4781
WEC	WEC	0.0422	Confirmed LTF	0.0422
LGEE	LGEE	0.1979	Confirmed LTF	0.1979
CPLE	CPLE	5.6026	Confirmed LTF	5.6026
CBM-W2	CBM-W2	13.1712	Confirmed LTF	13.1712
NY	NY	2.0422	Confirmed LTF	2.0422
TVA	TVA	3.2060	Confirmed LTF	3.2060
O-066	O-066	24.5241	Confirmed LTF	24.5241
SIGE	SIGE	0.4303	Confirmed LTF	0.4303
CBM-S2	CBM-S2	64.8637	Confirmed LTF	64.8637
CBM-S1	CBM-S1	0.7338	Confirmed LTF	0.7338
G-007	G-007	3.8168	Confirmed LTF	3.8168
MEC	MEC	0.9550	Confirmed LTF	0.9550
LAGN	LAGN	3.8518	Confirmed LTF	3.8518
AA2-074	AA2-074	3.6950	LTF	3.6950

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
168814632	314105	6AQUIA	DVP	314186	6FULLER ROAD	DVP	1	DVP_P1-2: LN 2089	single	678.68	113.92	117.65	DC	30.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5419	80/20	0.5419
314134	6CRANES	0.1739	80/20	0.1739
314190	6WESTMOR	0.5171	80/20	0.5171
315033	1BIRCHWDA	100.9501	80/20	100.9501
315034	1NORNECKC1	0.7558	80/20	0.7558
315035	1NORNECKC2	0.7284	80/20	0.7284
315037	1LDYSMT1	9.1596	80/20	9.1596
315038	1LDYSMT2	9.1596	80/20	9.1596
315039	1LDYSMT3	8.8175	80/20	8.8175
315040	1LDYSMT4	8.8340	80/20	8.8340
315041	1LDYSMT5	8.8616	80/20	8.8616
315043	1FOUR RIVERA	2.4950	80/20	2.4950
315044	1FOUR RIVERB	2.4950	80/20	2.4950
315045	1FOUR RIVERC	3.0495	80/20	3.0495
315046	1FOUR RIVERD	2.4950	80/20	2.4950
315047	1FOUR RIVERE	2.4950	80/20	2.4950
315048	1FOUR RIVERF	3.0495	80/20	3.0495
315050	1FOURRIVERG	3.9569	80/20	3.9569
315051	1AA1-145 CT1	3.9274	80/20	3.9274
315052	1AA1-145 CT2	3.9274	80/20	3.9274
316077	AC2-138 C	0.1912	80/20	0.1912
316156	AD2-030 C	0.2139	80/20	0.2139
925863	AC1-065 C	3.4588	Adder	4.07
927044	AC1-191 C	4.3397	Adder	5.11
934141	AD1-041 C	3.0009	80/20	3.0009
934781	AD1-105 C	7.2320	80/20	7.2320
936581	AD2-073 C	2.9660	80/20	2.9660
936591	AD2-074 C	5.1755	80/20	5.1755
938961	AE1-124 C	0.6019	80/20	0.6019
939245	AE1-155 C	12.6418	80/20	12.6418
939261	AE1-157 C O1	22.6227	80/20	22.6227
939271	AE1-158 C O1	23.0879	80/20	23.0879
939611	AE1-191 C	6.0018	80/20	6.0018
939755	AE1-206 C	22.0351	80/20	22.0351
940231	AE2-005 C	0.6289	Adder	0.74
940551	AE2-041	3.2514	Adder	3.83
942191	AE2-231 C O1	6.7729	80/20	6.7729
943431	AF1-014 C	0.5958	Adder	0.7
943471	AF1-018	3.2514	Adder	3.83
943601	AF1-031 C	9.6612	80/20	9.6612
943741	AF1-042 C	2.7081	80/20	2.7081

943991	AF1-067 C	4.7757	80/20	4.7757
944491	AF1-114 C	12.9805	80/20	12.9805
945831	AF1-248	0.0637	80/20	0.0637
946001	AF1-265	19.3290	80/20	19.3290
957191	AF2-013	37.1160	80/20	37.1160
957411	AF2-035 C	12.3144	80/20	12.3144
957551	AF2-049 C	10.0319	80/20	10.0319
957601	AF2-054 C	1.2358	80/20	1.2358
957971	AF2-091 C	4.4134	80/20	4.4134
958261	AF2-120 C	6.1782	80/20	6.1782
960091	AF2-300 C	3.0786	80/20	3.0786
961781	AG1-019	37.1160	80/20	37.1160
961951	AG1-038 C	2.9932	80/20	2.9932
962131	AG1-057	0.8616	Adder	1.91
962851	AG1-134 C	9.5514	80/20	9.5514
962861	AG1-135 C	5.8626	80/20	5.8626
962971	AG1-146 C	2.5699	80/20	2.5699
962981	AG1-147 C	5.9963	80/20	5.9963
963051	AG1-154 C	6.9948	80/20	6.9948
963341	AG1-183 C	9.1127	80/20	9.1127
963381	AG1-187	3.7148	80/20	3.7148
963611	AG1-210 C	0.7695	80/20	0.7695
963621	AG1-213 C	1.0262	80/20	1.0262
964021	AG1-256 C	1.6539	80/20	1.6539
964211	AG1-282 C	2.1487	80/20	2.1487
964591	AG1-322 O1	29.6912	80/20	29.6912
965231	AG1-388 C	2.1487	80/20	2.1487
965441	AG1-412 C	30.2480	80/20	30.2480
966661	AG1-536 C	5.3229	80/20	5.3229
966711	AG1-541 C	8.2096	80/20	8.2096
966871	AG1-558 C	0.5169	Adder	1.15
966881	AG1-559 C	3.0786	80/20	3.0786
WEC	WEC	0.1673	Confirmed LTF	0.1673
LGEE	LGEE	0.3619	Confirmed LTF	0.3619
CPLE	CPLE	1.7861	Confirmed LTF	1.7861
CBM-W2	CBM-W2	7.7862	Confirmed LTF	7.7862
NY	NY	0.7891	Confirmed LTF	0.7891
TVA	TVA	1.5036	Confirmed LTF	1.5036
SIGE	SIGE	0.2340	Confirmed LTF	0.2340
CBM-S2	CBM-S2	21.7674	Confirmed LTF	21.7674
CBM-S1	CBM-S1	0.3735	Confirmed LTF	0.3735
MEC	MEC	1.0313	Confirmed LTF	1.0313
LAGN	LAGN	1.8427	Confirmed LTF	1.8427
CBM-W1	CBM-W1	6.7436	Confirmed LTF	6.7436

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
168814490	314134	6CRANES	DVP	314142	6STAFORD	DVP	1	DVP_P1-2: LN 2089	single	678.68	139.29	143.02	DC	30.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5419	80/20	0.5419
314134	6CRANES	0.1739	80/20	0.1739
314190	6WESTMOR	0.5171	80/20	0.5171
315033	1BIRCHWDA	100.9501	80/20	100.9501
315034	1NORNECKC1	0.7558	80/20	0.7558
315035	1NORNECKC2	0.7284	80/20	0.7284
315037	1LDYSMT1	9.1596	80/20	9.1596
315038	1LDYSMT2	9.1596	80/20	9.1596
315039	1LDYSMT3	8.8175	80/20	8.8175
315040	1LDYSMT4	8.8340	80/20	8.8340
315041	1LDYSMT5	8.8616	80/20	8.8616
315043	1FOUR RIVERA	2.4950	80/20	2.4950
315044	1FOUR RIVERB	2.4950	80/20	2.4950
315045	1FOUR RIVERC	3.0495	80/20	3.0495
315046	1FOUR RIVERD	2.4950	80/20	2.4950
315047	1FOUR RIVERE	2.4950	80/20	2.4950
315048	1FOUR RIVERF	3.0495	80/20	3.0495
315050	1FOURRIVERG	3.9569	80/20	3.9569
315051	1AA1-145 CT1	3.9274	80/20	3.9274
315052	1AA1-145 CT2	3.9274	80/20	3.9274
316077	AC2-138 C	0.1912	80/20	0.1912
316156	AD2-030 C	0.2139	80/20	0.2139
925863	AC1-065 C	3.4588	Adder	4.07
927044	AC1-191 C	4.3397	Adder	5.11
934141	AD1-041 C	3.0009	80/20	3.0009
934781	AD1-105 C	7.2320	80/20	7.2320
936581	AD2-073 C	2.9660	80/20	2.9660
936591	AD2-074 C	5.1755	80/20	5.1755
938961	AE1-124 C	0.6019	80/20	0.6019
939245	AE1-155 C	12.6418	80/20	12.6418
939261	AE1-157 C O1	22.6227	80/20	22.6227
939271	AE1-158 C O1	23.0879	80/20	23.0879
939611	AE1-191 C	6.0018	80/20	6.0018
939755	AE1-206 C	22.0351	80/20	22.0351
940231	AE2-005 C	0.6289	Adder	0.74
940551	AE2-041	3.2514	Adder	3.83
942191	AE2-231 C O1	6.7729	80/20	6.7729
943431	AF1-014 C	0.5958	Adder	0.7
943471	AF1-018	3.2514	Adder	3.83
943601	AF1-031 C	9.6612	80/20	9.6612
943741	AF1-042 C	2.7081	80/20	2.7081

943991	AF1-067 C	4.7757	80/20	4.7757
944491	AF1-114 C	12.9805	80/20	12.9805
945831	AF1-248	0.0637	80/20	0.0637
946001	AF1-265	19.3290	80/20	19.3290
957191	AF2-013	37.1160	80/20	37.1160
957411	AF2-035 C	12.3144	80/20	12.3144
957551	AF2-049 C	10.0319	80/20	10.0319
957601	AF2-054 C	1.2358	80/20	1.2358
957971	AF2-091 C	4.4134	80/20	4.4134
958261	AF2-120 C	6.1782	80/20	6.1782
960091	AF2-300 C	3.0786	80/20	3.0786
961781	AG1-019	37.1160	80/20	37.1160
961951	AG1-038 C	2.9932	80/20	2.9932
962131	AG1-057	0.8616	Adder	1.91
962851	AG1-134 C	9.5514	80/20	9.5514
962861	AG1-135 C	5.8626	80/20	5.8626
962971	AG1-146 C	2.5699	80/20	2.5699
962981	AG1-147 C	5.9963	80/20	5.9963
963051	AG1-154 C	6.9948	80/20	6.9948
963341	AG1-183 C	9.1127	80/20	9.1127
963381	AG1-187	3.7148	80/20	3.7148
963611	AG1-210 C	0.7695	80/20	0.7695
963621	AG1-213 C	1.0262	80/20	1.0262
964021	AG1-256 C	1.6539	80/20	1.6539
964211	AG1-282 C	2.1487	80/20	2.1487
964591	AG1-322 O1	29.6912	80/20	29.6912
965231	AG1-388 C	2.1487	80/20	2.1487
965441	AG1-412 C	30.2480	80/20	30.2480
966661	AG1-536 C	5.3229	80/20	5.3229
966711	AG1-541 C	8.2096	80/20	8.2096
966871	AG1-558 C	0.5169	Adder	1.15
966881	AG1-559 C	3.0786	80/20	3.0786
WEC	WEC	0.1673	Confirmed LTF	0.1673
LGEE	LGEE	0.3619	Confirmed LTF	0.3619
CPLE	CPLE	1.7861	Confirmed LTF	1.7861
CBM-W2	CBM-W2	7.7862	Confirmed LTF	7.7862
NY	NY	0.7891	Confirmed LTF	0.7891
TVA	TVA	1.5036	Confirmed LTF	1.5036
SIGE	SIGE	0.2340	Confirmed LTF	0.2340
CBM-S2	CBM-S2	21.7674	Confirmed LTF	21.7674
CBM-S1	CBM-S1	0.3735	Confirmed LTF	0.3735
MEC	MEC	1.0313	Confirmed LTF	1.0313
LAGN	LAGN	1.8427	Confirmed LTF	1.8427
CBM-W1	CBM-W1	6.7436	Confirmed LTF	6.7436

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
168814734	314137	6FREDBRG	DVP	314134	6CRANES	DVP	1	DVP_P1-2: LN 2089	single	984.18	102.13	104.7	DC	30.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5419	80/20	0.5419
314190	6WESTMOR	0.5171	80/20	0.5171
315033	1BIRCHWDA	100.9525	80/20	100.9525
315034	1NORNECKC1	0.7558	80/20	0.7558
315035	1NORNECKC2	0.7285	80/20	0.7285
315037	1LDYSMT1	9.1599	80/20	9.1599
315038	1LDYSMT2	9.1599	80/20	9.1599
315039	1LDYSMT3	8.8177	80/20	8.8177
315040	1LDYSMT4	8.8343	80/20	8.8343
315041	1LDYSMT5	8.8619	80/20	8.8619
315043	1FOUR RIVERA	2.4952	80/20	2.4952
315044	1FOUR RIVERB	2.4952	80/20	2.4952
315045	1FOUR RIVERC	3.0497	80/20	3.0497
315046	1FOUR RIVERD	2.4952	80/20	2.4952
315047	1FOUR RIVERE	2.4952	80/20	2.4952
315048	1FOUR RIVERF	3.0497	80/20	3.0497
315050	1FOURRIVERG	3.9571	80/20	3.9571
315051	1AA1-145 CT1	3.9276	80/20	3.9276
315052	1AA1-145 CT2	3.9276	80/20	3.9276
316077	AC2-138 C	0.1912	80/20	0.1912
316156	AD2-030 C	0.2139	80/20	0.2139
925863	AC1-065 C	3.4592	Adder	4.07
927044	AC1-191 C	4.3402	Adder	5.11
934141	AD1-041 C	3.0012	80/20	3.0012
934781	AD1-105 C	7.2325	80/20	7.2325
936581	AD2-073 C	2.9661	80/20	2.9661
936591	AD2-074 C	5.1759	80/20	5.1759
938961	AE1-124 C	0.6019	80/20	0.6019
939245	AE1-155 C	12.6426	80/20	12.6426
939261	AE1-157 C O1	22.6235	80/20	22.6235
939271	AE1-158 C O1	23.0887	80/20	23.0887
939611	AE1-191 C	6.0024	80/20	6.0024
939755	AE1-206 C	22.0368	80/20	22.0368
940231	AE2-005 C	0.6289	Adder	0.74
940551	AE2-041	3.2518	Adder	3.83
942191	AE2-231 C O1	6.7732	80/20	6.7732
943431	AF1-014 C	0.5958	Adder	0.7
943471	AF1-018	3.2518	Adder	3.83
943601	AF1-031 C	9.6618	80/20	9.6618
943741	AF1-042 C	2.7083	80/20	2.7083
943991	AF1-067 C	4.7760	80/20	4.7760

944491	AF1-114 C	12.9809	80/20	12.9809
945831	AF1-248	0.0637	80/20	0.0637
946001	AF1-265	19.3305	80/20	19.3305
957191	AF2-013	37.1170	80/20	37.1170
957411	AF2-035 C	12.3149	80/20	12.3149
957551	AF2-049 C	10.0323	80/20	10.0323
957601	AF2-054 C	1.2359	80/20	1.2359
957971	AF2-091 C	4.4135	80/20	4.4135
958261	AF2-120 C	6.1785	80/20	6.1785
960091	AF2-300 C	3.0787	80/20	3.0787
961781	AG1-019	37.1170	80/20	37.1170
961951	AG1-038 C	2.9934	80/20	2.9934
962131	AG1-057	0.8617	Adder	1.91
962851	AG1-134 C	9.5520	80/20	9.5520
962861	AG1-135 C	5.8630	80/20	5.8630
962971	AG1-146 C	2.5702	80/20	2.5702
962981	AG1-147 C	5.9972	80/20	5.9972
963051	AG1-154 C	6.9950	80/20	6.9950
963341	AG1-183 C	9.1130	80/20	9.1130
963381	AG1-187	3.7150	80/20	3.7150
963611	AG1-210 C	0.7696	80/20	0.7696
963621	AG1-213 C	1.0262	80/20	1.0262
964021	AG1-256 C	1.6540	80/20	1.6540
964211	AG1-282 C	2.1488	80/20	2.1488
964591	AG1-322 O1	29.6919	80/20	29.6919
965231	AG1-388 C	2.1488	80/20	2.1488
965441	AG1-412 C	30.2488	80/20	30.2488
966661	AG1-536 C	5.3232	80/20	5.3232
966711	AG1-541 C	8.2099	80/20	8.2099
966871	AG1-558 C	0.5169	Adder	1.15
966881	AG1-559 C	3.0787	80/20	3.0787
WEC	WEC	0.1679	Confirmed LTF	0.1679
LGEE	LGEE	0.3632	Confirmed LTF	0.3632
CPLE	CPLE	1.7875	Confirmed LTF	1.7875
CBM-W2	CBM-W2	7.8042	Confirmed LTF	7.8042
NY	NY	0.7880	Confirmed LTF	0.7880
TVA	TVA	1.5064	Confirmed LTF	1.5064
SIGE	SIGE	0.2340	Confirmed LTF	0.2340
CBM-S2	CBM-S2	21.7883	Confirmed LTF	21.7883
CBM-S1	CBM-S1	0.3743	Confirmed LTF	0.3743
MEC	MEC	1.0344	Confirmed LTF	1.0344
LAGN	LAGN	1.8462	Confirmed LTF	1.8462
CBM-W1	CBM-W1	6.7717	Confirmed LTF	6.7717

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
168814563	314142	6STAFORD	DVP	314145	6AQUI_HARB_B	DVP	1	DVP_P1-2: LN 2089	single	678.68	124.11	127.84	DC	30.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5419	80/20	0.5419
314134	6CRANES	0.1739	80/20	0.1739
314190	6WESTMOR	0.5171	80/20	0.5171
315033	1BIRCHWDA	100.9501	80/20	100.9501
315034	1NORNECKC1	0.7558	80/20	0.7558
315035	1NORNECKC2	0.7284	80/20	0.7284
315037	1LDYSMT1	9.1596	80/20	9.1596
315038	1LDYSMT2	9.1596	80/20	9.1596
315039	1LDYSMT3	8.8175	80/20	8.8175
315040	1LDYSMT4	8.8340	80/20	8.8340
315041	1LDYSMT5	8.8616	80/20	8.8616
315043	1FOUR RIVERA	2.4950	80/20	2.4950
315044	1FOUR RIVERB	2.4950	80/20	2.4950
315045	1FOUR RIVERC	3.0495	80/20	3.0495
315046	1FOUR RIVERD	2.4950	80/20	2.4950
315047	1FOUR RIVERE	2.4950	80/20	2.4950
315048	1FOUR RIVERF	3.0495	80/20	3.0495
315050	1FOURRIVERG	3.9569	80/20	3.9569
315051	1AA1-145 CT1	3.9274	80/20	3.9274
315052	1AA1-145 CT2	3.9274	80/20	3.9274
316077	AC2-138 C	0.1912	80/20	0.1912
316156	AD2-030 C	0.2139	80/20	0.2139
925863	AC1-065 C	3.4588	Adder	4.07
927044	AC1-191 C	4.3397	Adder	5.11
934141	AD1-041 C	3.0009	80/20	3.0009
934781	AD1-105 C	7.2320	80/20	7.2320
936581	AD2-073 C	2.9660	80/20	2.9660
936591	AD2-074 C	5.1755	80/20	5.1755
938961	AE1-124 C	0.6019	80/20	0.6019
939245	AE1-155 C	12.6418	80/20	12.6418
939261	AE1-157 C O1	22.6227	80/20	22.6227
939271	AE1-158 C O1	23.0879	80/20	23.0879
939611	AE1-191 C	6.0018	80/20	6.0018
939755	AE1-206 C	22.0351	80/20	22.0351
940231	AE2-005 C	0.6289	Adder	0.74
940551	AE2-041	3.2514	Adder	3.83
942191	AE2-231 C O1	6.7729	80/20	6.7729
943431	AF1-014 C	0.5958	Adder	0.7
943471	AF1-018	3.2514	Adder	3.83
943601	AF1-031 C	9.6612	80/20	9.6612
943741	AF1-042 C	2.7081	80/20	2.7081

943991	AF1-067 C	4.7757	80/20	4.7757
944491	AF1-114 C	12.9805	80/20	12.9805
945831	AF1-248	0.0637	80/20	0.0637
946001	AF1-265	19.3290	80/20	19.3290
957191	AF2-013	37.1160	80/20	37.1160
957411	AF2-035 C	12.3144	80/20	12.3144
957551	AF2-049 C	10.0319	80/20	10.0319
957601	AF2-054 C	1.2358	80/20	1.2358
957971	AF2-091 C	4.4134	80/20	4.4134
958261	AF2-120 C	6.1782	80/20	6.1782
960091	AF2-300 C	3.0786	80/20	3.0786
961781	AG1-019	37.1160	80/20	37.1160
961951	AG1-038 C	2.9932	80/20	2.9932
962131	AG1-057	0.8616	Adder	1.91
962851	AG1-134 C	9.5514	80/20	9.5514
962861	AG1-135 C	5.8626	80/20	5.8626
962971	AG1-146 C	2.5699	80/20	2.5699
962981	AG1-147 C	5.9963	80/20	5.9963
963051	AG1-154 C	6.9948	80/20	6.9948
963341	AG1-183 C	9.1127	80/20	9.1127
963381	AG1-187	3.7148	80/20	3.7148
963611	AG1-210 C	0.7695	80/20	0.7695
963621	AG1-213 C	1.0262	80/20	1.0262
964021	AG1-256 C	1.6539	80/20	1.6539
964211	AG1-282 C	2.1487	80/20	2.1487
964591	AG1-322 O1	29.6912	80/20	29.6912
965231	AG1-388 C	2.1487	80/20	2.1487
965441	AG1-412 C	30.2480	80/20	30.2480
966661	AG1-536 C	5.3229	80/20	5.3229
966711	AG1-541 C	8.2096	80/20	8.2096
966871	AG1-558 C	0.5169	Adder	1.15
966881	AG1-559 C	3.0786	80/20	3.0786
WEC	WEC	0.1673	Confirmed LTF	0.1673
LGEE	LGEE	0.3619	Confirmed LTF	0.3619
CPLE	CPLE	1.7861	Confirmed LTF	1.7861
CBM-W2	CBM-W2	7.7862	Confirmed LTF	7.7862
NY	NY	0.7891	Confirmed LTF	0.7891
TVA	TVA	1.5036	Confirmed LTF	1.5036
SIGE	SIGE	0.2340	Confirmed LTF	0.2340
CBM-S2	CBM-S2	21.7674	Confirmed LTF	21.7674
CBM-S1	CBM-S1	0.3735	Confirmed LTF	0.3735
MEC	MEC	1.0313	Confirmed LTF	1.0313
LAGN	LAGN	1.8427	Confirmed LTF	1.8427
CBM-W1	CBM-W1	6.7436	Confirmed LTF	6.7436

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
168814615	314144	6AQUI_HARB_A	DVP	314105	6AQUIA	DVP	1	DVP_P1-2: LN 2089	single	678.68	118.0	121.73	DC	30.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5419	80/20	0.5419
314134	6CRANES	0.1739	80/20	0.1739
314190	6WESTMOR	0.5171	80/20	0.5171
315033	1BIRCHWDA	100.9501	80/20	100.9501
315034	1NORNECKC1	0.7558	80/20	0.7558
315035	1NORNECKC2	0.7284	80/20	0.7284
315037	1LDYSMT1	9.1596	80/20	9.1596
315038	1LDYSMT2	9.1596	80/20	9.1596
315039	1LDYSMT3	8.8175	80/20	8.8175
315040	1LDYSMT4	8.8340	80/20	8.8340
315041	1LDYSMT5	8.8616	80/20	8.8616
315043	1FOUR RIVERA	2.4950	80/20	2.4950
315044	1FOUR RIVERB	2.4950	80/20	2.4950
315045	1FOUR RIVERC	3.0495	80/20	3.0495
315046	1FOUR RIVERD	2.4950	80/20	2.4950
315047	1FOUR RIVERE	2.4950	80/20	2.4950
315048	1FOUR RIVERF	3.0495	80/20	3.0495
315050	1FOURRIVERG	3.9569	80/20	3.9569
315051	1AA1-145 CT1	3.9274	80/20	3.9274
315052	1AA1-145 CT2	3.9274	80/20	3.9274
316077	AC2-138 C	0.1912	80/20	0.1912
316156	AD2-030 C	0.2139	80/20	0.2139
925863	AC1-065 C	3.4588	Adder	4.07
927044	AC1-191 C	4.3397	Adder	5.11
934141	AD1-041 C	3.0009	80/20	3.0009
934781	AD1-105 C	7.2320	80/20	7.2320
936581	AD2-073 C	2.9660	80/20	2.9660
936591	AD2-074 C	5.1755	80/20	5.1755
938961	AE1-124 C	0.6019	80/20	0.6019
939245	AE1-155 C	12.6418	80/20	12.6418
939261	AE1-157 C O1	22.6227	80/20	22.6227
939271	AE1-158 C O1	23.0879	80/20	23.0879
939611	AE1-191 C	6.0018	80/20	6.0018
939755	AE1-206 C	22.0351	80/20	22.0351
940231	AE2-005 C	0.6289	Adder	0.74
940551	AE2-041	3.2514	Adder	3.83
942191	AE2-231 C O1	6.7729	80/20	6.7729
943431	AF1-014 C	0.5958	Adder	0.7
943471	AF1-018	3.2514	Adder	3.83
943601	AF1-031 C	9.6612	80/20	9.6612
943741	AF1-042 C	2.7081	80/20	2.7081

943991	AF1-067 C	4.7757	80/20	4.7757
944491	AF1-114 C	12.9805	80/20	12.9805
945831	AF1-248	0.0637	80/20	0.0637
946001	AF1-265	19.3290	80/20	19.3290
957191	AF2-013	37.1160	80/20	37.1160
957411	AF2-035 C	12.3144	80/20	12.3144
957551	AF2-049 C	10.0319	80/20	10.0319
957601	AF2-054 C	1.2358	80/20	1.2358
957971	AF2-091 C	4.4134	80/20	4.4134
958261	AF2-120 C	6.1782	80/20	6.1782
960091	AF2-300 C	3.0786	80/20	3.0786
961781	AG1-019	37.1160	80/20	37.1160
961951	AG1-038 C	2.9932	80/20	2.9932
962131	AG1-057	0.8616	Adder	1.91
962851	AG1-134 C	9.5514	80/20	9.5514
962861	AG1-135 C	5.8626	80/20	5.8626
962971	AG1-146 C	2.5699	80/20	2.5699
962981	AG1-147 C	5.9963	80/20	5.9963
963051	AG1-154 C	6.9948	80/20	6.9948
963341	AG1-183 C	9.1127	80/20	9.1127
963381	AG1-187	3.7148	80/20	3.7148
963611	AG1-210 C	0.7695	80/20	0.7695
963621	AG1-213 C	1.0262	80/20	1.0262
964021	AG1-256 C	1.6539	80/20	1.6539
964211	AG1-282 C	2.1487	80/20	2.1487
964591	AG1-322 O1	29.6912	80/20	29.6912
965231	AG1-388 C	2.1487	80/20	2.1487
965441	AG1-412 C	30.2480	80/20	30.2480
966661	AG1-536 C	5.3229	80/20	5.3229
966711	AG1-541 C	8.2096	80/20	8.2096
966871	AG1-558 C	0.5169	Adder	1.15
966881	AG1-559 C	3.0786	80/20	3.0786
WEC	WEC	0.1673	Confirmed LTF	0.1673
LGEE	LGEE	0.3619	Confirmed LTF	0.3619
CPLE	CPLE	1.7861	Confirmed LTF	1.7861
CBM-W2	CBM-W2	7.7862	Confirmed LTF	7.7862
NY	NY	0.7891	Confirmed LTF	0.7891
TVA	TVA	1.5036	Confirmed LTF	1.5036
SIGE	SIGE	0.2340	Confirmed LTF	0.2340
CBM-S2	CBM-S2	21.7674	Confirmed LTF	21.7674
CBM-S1	CBM-S1	0.3735	Confirmed LTF	0.3735
MEC	MEC	1.0313	Confirmed LTF	1.0313
LAGN	LAGN	1.8427	Confirmed LTF	1.8427
CBM-W1	CBM-W1	6.7436	Confirmed LTF	6.7436

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
168814642	314186	6FULLER ROAD	DVP	314074	6POSSUM	DVP	1	DVP_P1-2: LN 2089	single	678.68	112.87	116.6	DC	30.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5419	80/20	0.5419
314134	6CRANES	0.1739	80/20	0.1739
314190	6WESTMOR	0.5171	80/20	0.5171
315033	1BIRCHWDA	100.9501	80/20	100.9501
315034	1NORNECKC1	0.7558	80/20	0.7558
315035	1NORNECKC2	0.7284	80/20	0.7284
315037	1LDYSMT1	9.1596	80/20	9.1596
315038	1LDYSMT2	9.1596	80/20	9.1596
315039	1LDYSMT3	8.8175	80/20	8.8175
315040	1LDYSMT4	8.8340	80/20	8.8340
315041	1LDYSMT5	8.8616	80/20	8.8616
315043	1FOUR RIVERA	2.4950	80/20	2.4950
315044	1FOUR RIVERB	2.4950	80/20	2.4950
315045	1FOUR RIVERC	3.0495	80/20	3.0495
315046	1FOUR RIVERD	2.4950	80/20	2.4950
315047	1FOUR RIVERE	2.4950	80/20	2.4950
315048	1FOUR RIVERF	3.0495	80/20	3.0495
315050	1FOURRIVERG	3.9569	80/20	3.9569
315051	1AA1-145 CT1	3.9274	80/20	3.9274
315052	1AA1-145 CT2	3.9274	80/20	3.9274
316077	AC2-138 C	0.1912	80/20	0.1912
316156	AD2-030 C	0.2139	80/20	0.2139
925863	AC1-065 C	3.4588	Adder	4.07
927044	AC1-191 C	4.3397	Adder	5.11
934141	AD1-041 C	3.0009	80/20	3.0009
934781	AD1-105 C	7.2320	80/20	7.2320
936581	AD2-073 C	2.9660	80/20	2.9660
936591	AD2-074 C	5.1755	80/20	5.1755
938961	AE1-124 C	0.6019	80/20	0.6019
939245	AE1-155 C	12.6418	80/20	12.6418
939261	AE1-157 C O1	22.6227	80/20	22.6227
939271	AE1-158 C O1	23.0879	80/20	23.0879
939611	AE1-191 C	6.0018	80/20	6.0018
939755	AE1-206 C	22.0351	80/20	22.0351
940231	AE2-005 C	0.6289	Adder	0.74
940551	AE2-041	3.2514	Adder	3.83
942191	AE2-231 C O1	6.7729	80/20	6.7729
943431	AF1-014 C	0.5958	Adder	0.7
943471	AF1-018	3.2514	Adder	3.83
943601	AF1-031 C	9.6612	80/20	9.6612
943741	AF1-042 C	2.7081	80/20	2.7081

943991	AF1-067 C	4.7757	80/20	4.7757
944491	AF1-114 C	12.9805	80/20	12.9805
945831	AF1-248	0.0637	80/20	0.0637
946001	AF1-265	19.3290	80/20	19.3290
957191	AF2-013	37.1160	80/20	37.1160
957411	AF2-035 C	12.3144	80/20	12.3144
957551	AF2-049 C	10.0319	80/20	10.0319
957601	AF2-054 C	1.2358	80/20	1.2358
957971	AF2-091 C	4.4134	80/20	4.4134
958261	AF2-120 C	6.1782	80/20	6.1782
960091	AF2-300 C	3.0786	80/20	3.0786
961781	AG1-019	37.1160	80/20	37.1160
961951	AG1-038 C	2.9932	80/20	2.9932
962131	AG1-057	0.8616	Adder	1.91
962851	AG1-134 C	9.5514	80/20	9.5514
962861	AG1-135 C	5.8626	80/20	5.8626
962971	AG1-146 C	2.5699	80/20	2.5699
962981	AG1-147 C	5.9963	80/20	5.9963
963051	AG1-154 C	6.9948	80/20	6.9948
963341	AG1-183 C	9.1127	80/20	9.1127
963381	AG1-187	3.7148	80/20	3.7148
963611	AG1-210 C	0.7695	80/20	0.7695
963621	AG1-213 C	1.0262	80/20	1.0262
964021	AG1-256 C	1.6539	80/20	1.6539
964211	AG1-282 C	2.1487	80/20	2.1487
964591	AG1-322 O1	29.6912	80/20	29.6912
965231	AG1-388 C	2.1487	80/20	2.1487
965441	AG1-412 C	30.2480	80/20	30.2480
966661	AG1-536 C	5.3229	80/20	5.3229
966711	AG1-541 C	8.2096	80/20	8.2096
966871	AG1-558 C	0.5169	Adder	1.15
966881	AG1-559 C	3.0786	80/20	3.0786
WEC	WEC	0.1673	Confirmed LTF	0.1673
LGEE	LGEE	0.3619	Confirmed LTF	0.3619
CPLE	CPLE	1.7861	Confirmed LTF	1.7861
CBM-W2	CBM-W2	7.7862	Confirmed LTF	7.7862
NY	NY	0.7891	Confirmed LTF	0.7891
TVA	TVA	1.5036	Confirmed LTF	1.5036
SIGE	SIGE	0.2340	Confirmed LTF	0.2340
CBM-S2	CBM-S2	21.7674	Confirmed LTF	21.7674
CBM-S1	CBM-S1	0.3735	Confirmed LTF	0.3735
MEC	MEC	1.0313	Confirmed LTF	1.0313
LAGN	LAGN	1.8427	Confirmed LTF	1.8427
CBM-W1	CBM-W1	6.7436	Confirmed LTF	6.7436

11.6.8 Index 8

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
168814559	314197	6LDYSMITH CT	DVP	314196	6LADYSMITH	DVP	1	314222 6HANOVER 230 939750 AE1-206 TAP 230 1	single	1151.5	138.08	141.64	DC	53.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.4441	80/20	0.4441
314134	6CRANES	0.1111	80/20	0.1111
314190	6WESTMOR	0.3655	80/20	0.3655
315008	1POSSM6A	1.6185	80/20	1.6185
315009	1POSSM6B	1.6185	80/20	1.6185
315010	1POSSM6S	2.5233	80/20	2.5233
315033	1BIRCHWDA	84.0568	80/20	84.0568
315034	1NORNECKC1	0.4682	80/20	0.4682
315035	1NORNECKC2	0.4513	80/20	0.4513
315037	1LDYSMT1	19.3442	80/20	19.3442
315038	1LDYSMT2	19.3442	80/20	19.3442
315039	1LDYSMT3	18.6217	80/20	18.6217
315040	1LDYSMT4	18.6567	80/20	18.6567
315041	1LDYSMT5	18.7150	80/20	18.7150
315043	1FOUR RIVERA	12.5849	80/20	12.5849
315044	1FOUR RIVERB	12.5849	80/20	12.5849
315045	1FOUR RIVERC	15.3816	80/20	15.3816
315046	1FOUR RIVERD	12.5849	80/20	12.5849
315047	1FOUR RIVERE	12.5849	80/20	12.5849
315048	1FOUR RIVERF	15.3816	80/20	15.3816
315050	1FOURRIVERG	1.8758	80/20	1.8758
315051	1AA1-145 CT1	19.8096	80/20	19.8096
315052	1AA1-145 CT2	19.8096	80/20	19.8096
316077	AC2-138 C	0.1185	80/20	0.1185
934781	AD1-105 C	3.8175	80/20	3.8175
936581	AD2-073 C	1.9931	80/20	1.9931
936591	AD2-074 C	2.7840	80/20	2.7840
938961	AE1-124 C	0.4500	80/20	0.4500
939245	AE1-155 C	7.0802	80/20	7.0802
939261	AE1-157 C O1	57.4639	80/20	57.4639
939271	AE1-158 C O1	58.6456	80/20	58.6456
939755	AE1-206 C	126.2989	80/20	126.2989
942191	AE2-231 C O1	19.4993	80/20	19.4993
943601	AF1-031 C	5.0998	80/20	5.0998
943741	AF1-042 C	1.4567	80/20	1.4567
943991	AF1-067 C	2.5209	80/20	2.5209
944491	AF1-114 C	9.9498	80/20	9.9498
945831	AF1-248	0.0395	80/20	0.0395
946001	AF1-265	110.7885	80/20	110.7885

957191	AF2-013	29.9640	80/20	29.9640
957411	AF2-035 C	35.4533	80/20	35.4533
957551	AF2-049 C	25.4820	80/20	25.4820
957971	AF2-091 C	3.3829	80/20	3.3829
958261	AF2-120 C	3.4559	80/20	3.4559
960091	AF2-300 C	8.8633	80/20	8.8633
961781	AG1-019	29.9640	80/20	29.9640
961951	AG1-038 C	1.6101	80/20	1.6101
962851	AG1-134 C	5.0418	80/20	5.0418
962861	AG1-135 C	3.2281	80/20	3.2281
962971	AG1-146 C	1.2528	80/20	1.2528
962981	AG1-147 C	2.9232	80/20	2.9232
963051	AG1-154 C	14.7724	80/20	14.7724
963341	AG1-183 C	26.2354	80/20	26.2354
963381	AG1-187	10.6951	80/20	10.6951
963611	AG1-210 C	0.4768	80/20	0.4768
963621	AG1-213 C	2.9544	80/20	2.9544
964021	AG1-256 C	1.0683	80/20	1.0683
964211	AG1-282 C	1.2662	80/20	1.2662
964591	AG1-322 O1	24.7226	80/20	24.7226
965231	AG1-388 C	1.2662	80/20	1.2662
965441	AG1-412 C	53.2864	80/20	53.2864
966661	AG1-536 C	2.9811	80/20	2.9811
966711	AG1-541 C	23.6355	80/20	23.6355
966881	AG1-559 C	8.8633	80/20	8.8633
CALDERWOOD	CALDERWOOD	0.6093	Confirmed LTF	0.6093
NY	NY	0.1853	Confirmed LTF	0.1853
PRAIRIE	PRAIRIE	2.8775	Confirmed LTF	2.8775
CHEOAH	CHEOAH	0.6151	Confirmed LTF	0.6151
COTTONWOOD	COTTONWOOD	2.4717	Confirmed LTF	2.4717
HAMLET	HAMLET	0.8079	Confirmed LTF	0.8079
GIBSON	GIBSON	0.5908	Confirmed LTF	0.5908
BLUEG	BLUEG	1.8784	Confirmed LTF	1.8784
TRIMBLE	TRIMBLE	0.6010	Confirmed LTF	0.6010
CATAWBA	CATAWBA	0.4704	Confirmed LTF	0.4704

11.6.9 Index 9

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
168814475	314222	6HANOVER	DVP	314218	6ELMONT	DVP	1	Base Case	single	1123.3	100.55	101.7	DC	12.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.0870	80/20	0.0870
314134	6CRANES	0.0270	80/20	0.0270
315033	1BIRCHWDA	17.8619	80/20	17.8619
315037	1LDYSMT1	4.7000	80/20	4.7000
315038	1LDYSMT2	4.7000	80/20	4.7000
315039	1LDYSMT3	4.5245	80/20	4.5245
315040	1LDYSMT4	4.5330	80/20	4.5330
315041	1LDYSMT5	4.5471	80/20	4.5471
315043	1FOUR RIVERA	12.0649	80/20	12.0649
315044	1FOUR RIVERB	12.0649	80/20	12.0649
315045	1FOUR RIVERC	14.7460	80/20	14.7460
315046	1FOUR RIVERD	12.0649	80/20	12.0649
315047	1FOUR RIVERE	12.0649	80/20	12.0649
315048	1FOUR RIVERF	14.7460	80/20	14.7460
315051	1AA1-145 CT1	18.9910	80/20	18.9910
315052	1AA1-145 CT2	18.9910	80/20	18.9910
939261	AE1-157 C O1	25.8887	80/20	25.8887
939271	AE1-158 C O1	26.4211	80/20	26.4211
939755	AE1-206 C	128.8913	80/20	128.8913
942191	AE2-231 C O1	11.1345	80/20	11.1345
946001	AF1-265	113.0625	80/20	113.0625
957191	AF2-013	5.3940	80/20	5.3940
957411	AF2-035 C	20.2445	80/20	20.2445
957551	AF2-049 C	11.4802	80/20	11.4802
960091	AF2-300 C	5.0611	80/20	5.0611
961781	AG1-019	5.3940	80/20	5.3940
963051	AG1-154 C	3.5892	80/20	3.5892
963341	AG1-183 C	14.9809	80/20	14.9809
963381	AG1-187	6.1071	80/20	6.1071
963621	AG1-213 C	1.6870	80/20	1.6870
964591	AG1-322 O1	5.2535	80/20	5.2535
965441	AG1-412 C	12.9048	80/20	12.9048
966711	AG1-541 C	13.4963	80/20	13.4963
966881	AG1-559 C	5.0611	80/20	5.0611
G-007A	G-007A	1.5608	Confirmed LTF	1.5608
VFT	VFT	4.1603	Confirmed LTF	4.1603
CALDERWOOD	CALDERWOOD	0.8717	Confirmed LTF	0.8717
PRAIRIE	PRAIRIE	3.3347	Confirmed LTF	3.3347
CHEOAH	CHEOAH	0.8879	Confirmed LTF	0.8879
CBM-N	CBM-N	0.7572	Confirmed LTF	0.7572
COTTONWOOD	COTTONWOOD	3.2928	Confirmed LTF	3.2928
HAMLET	HAMLET	1.5696	Confirmed LTF	1.5696

GIBSON	GIBSON	0.6279	Confirmed LTF	0.6279
BLUEG	BLUEG	1.9738	Confirmed LTF	1.9738
TRIMBLE	TRIMBLE	0.6288	Confirmed LTF	0.6288
CATAWBA	CATAWBA	0.8263	Confirmed LTF	0.8263

11.6.10 Index 10

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
168814460	939750	AE1-206 TAP	DVP	314222	6HANOVER	DVP	1	Base Case	single	1103.56	108.21	109.38	DC	12.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.0870	80/20	0.0870
314134	6CRANES	0.0270	80/20	0.0270
315033	1BIRCHWDA	17.8619	80/20	17.8619
315037	1LDYSMT1	4.7000	80/20	4.7000
315038	1LDYSMT2	4.7000	80/20	4.7000
315039	1LDYSMT3	4.5245	80/20	4.5245
315040	1LDYSMT4	4.5330	80/20	4.5330
315041	1LDYSMT5	4.5471	80/20	4.5471
315043	1FOUR RIVERA	12.0649	80/20	12.0649
315044	1FOUR RIVERB	12.0649	80/20	12.0649
315045	1FOUR RIVERC	14.7460	80/20	14.7460
315046	1FOUR RIVERD	12.0649	80/20	12.0649
315047	1FOUR RIVERE	12.0649	80/20	12.0649
315048	1FOUR RIVERF	14.7460	80/20	14.7460
315051	1AA1-145 CT1	18.9910	80/20	18.9910
315052	1AA1-145 CT2	18.9910	80/20	18.9910
939261	AE1-157 C O1	25.8887	80/20	25.8887
939271	AE1-158 C O1	26.4211	80/20	26.4211
939755	AE1-206 C	128.8913	80/20	128.8913
942191	AE2-231 C O1	11.1345	80/20	11.1345
946001	AF1-265	113.0625	80/20	113.0625
957191	AF2-013	5.3940	80/20	5.3940
957411	AF2-035 C	20.2445	80/20	20.2445
957551	AF2-049 C	11.4802	80/20	11.4802
960091	AF2-300 C	5.0611	80/20	5.0611
961781	AG1-019	5.3940	80/20	5.3940
963051	AG1-154 C	3.5892	80/20	3.5892
963341	AG1-183 C	14.9809	80/20	14.9809
963381	AG1-187	6.1071	80/20	6.1071
963621	AG1-213 C	1.6870	80/20	1.6870
964591	AG1-322 O1	5.2535	80/20	5.2535
965441	AG1-412 C	12.9048	80/20	12.9048
966711	AG1-541 C	13.4963	80/20	13.4963
966881	AG1-559 C	5.0611	80/20	5.0611
G-007A	G-007A	1.5608	Confirmed LTF	1.5608
VFT	VFT	4.1603	Confirmed LTF	4.1603
CALDERWOOD	CALDERWOOD	0.8717	Confirmed LTF	0.8717
PRAIRIE	PRAIRIE	3.3347	Confirmed LTF	3.3347
CHEOAH	CHEOAH	0.8879	Confirmed LTF	0.8879
CBM-N	CBM-N	0.7572	Confirmed LTF	0.7572
COTTONWOOD	COTTONWOOD	3.2928	Confirmed LTF	3.2928
HAMLET	HAMLET	1.5696	Confirmed LTF	1.5696

GIBSON	GIBSON	0.6279	Confirmed LTF	0.6279
BLUEG	BLUEG	1.9738	Confirmed LTF	1.9738
TRIMBLE	TRIMBLE	0.6288	Confirmed LTF	0.6288
CATAWBA	CATAWBA	0.8263	Confirmed LTF	0.8263

11.7 Queue Dependencies

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

Queue Number	Project Name	Status
AA1-145	Four Rivers 230kV	In Service
AA2-074	CPLE-PJM	Confirmed
AA2-079	Possum Point 230kV	In Service
AB1-027	Old Church 34.5 KV	Partially in Service - Under Construction
AB2-024	Correctional 34.5kV	In Service
AB2-029	Remington 34.5kV	In Service
AB2-068	Chickahominy 500kV	Withdrawn
AB2-134	Hopewell-Surry 230kV	In Service
AB2-158	Louisa-South Anna 230kV	Under Construction
AB2-160	Reams 115kV	Suspended
AB2-190	Hopewell-Surry 230kV	Engineering and Procurement
AC1-043	Mountain Run-Mitchell 115 kV	Suspended
AC1-065	Harmony Village-Shackleford 115kV	Engineering and Procurement
AC1-076	Locust Grove-Paytes 115kV	Engineering and Procurement
AC1-107	Chickahominy 500kV	Engineering and Procurement
AC1-112	Old Church 34.5kV	In Service
AC1-118	Westmoreland 34.5kV	In Service
AC1-120	Mitchell-Mountain Run 115kV	Engineering and Procurement
AC1-121	Mitchell-Mountain Run 115kV	Engineering and Procurement
AC1-143	Brandy-Remington 115kV	Engineering and Procurement
AC1-158	Spotsylvania 500kV	Partially in Service - Under Construction
AC1-164	Chickahominy 230kV	Engineering and Procurement
AC1-191	Elmont 115kV	Active
AC1-216	Hopewell-Surry 230kV	Partially in Service - Under Construction
AC2-070	Old Church 34.5kV	Engineering and Procurement
AC2-137	Elko 34.5kV	Partially in Service - Under Construction
AC2-138	Northern Neck 34.5kV	Partially in Service - Under Construction
AD1-025	Hopewell-Surry 230 kV	Active
AD1-041	Harmony Village-Shackleford 115 kV	Engineering and Procurement
AD1-063	Harmony Village 34.5 kV	In Service
AD1-105	Kings Dominion DP 115 kV	Active
AD1-115	Mountain Run-Mitchell 115 kV	Active
AD1-151	Hopewell-Surry 230 kV	Active
AD2-007	Hopewell-Surry 230 kV	Active
AD2-008	Hopewell-Surry 230 kV	Active
AD2-030	Wan 34.5 kV	In Service
AD2-073	Sanders DP 230 kV	Active
AD2-074	Garner DP-Lancaster 115 kV	Active
AD2-097	Spruance NUG 230kV	In Service

AE1-044	Morrisville 230 kV	Active
AE1-074	Winterpock 34.5 kV	Engineering and Procurement
AE1-124	Oak Grove 34.5 kV	Engineering and Procurement
AE1-154	Louisa-South Anna 230 kV	Engineering and Procurement
AE1-155	Garner-Northern Neck 115 kV	Active
AE1-157	Ladysmith CT-St. Johns 230 kV	Active
AE1-158	Ladysmith CT-St. Johns 230 kV	Active
AE1-175	Light Foot 34.5 kV	Engineering and Procurement
AE1-191	Harmony Village-Shackleford 115 kV	Active
AE1-206	Four Rivers-Hanover 230 kV	Active
AE2-005	Harmony Village-Shackleford 115 kV	Engineering and Procurement
AE2-027	Harrowgate-Locks 115kV	Active
AE2-041	Harmony Village 230 kV	Active
AE2-079	Poolesville 34.5 kV	Engineering and Procurement
AE2-134	Locust Grove-Paytes 115 kV	Suspended
AE2-155	Old Church 34.5 kV	Partially in Service - Under Construction
AE2-212	Harrowgate 34 kV	Active
AE2-227	Iron Bridge 34 kV	Engineering and Procurement
AE2-228	Tyler 34 kv	Engineering and Procurement
AE2-231	St. Johns 115 kV	Active
AE2-250	Purdy Sw.-Reams 115 kV	Active
AE2-270	Hopewell-Surry 230 kV	Active
AF1-014	Harmony Village-Shackleford 115 kV	Active
AF1-018	Harmony Village 230 kV	Active
AF1-031	Kings Dominion DP 115 kV	Active
AF1-033	Poolesville 34 kV	Engineering and Procurement
AF1-042	Garner DP-Lancaster 115 kV	Active
AF1-067	Kings Dominion DP 115 kV	Active
AF1-079	Louisa-South Anna 230 kV	Active
AF1-114	Oak Grove-Dahlgren 230 kV	Active
AF1-128	Chesterfield 230 kV	Active
AF1-129	Chesterfield 230 kV	Active
AF1-201	Hayes-White Marsh 115 kV	Active
AF1-248	Northern Neck 34.5 kV	Partially in Service - Under Construction
AF1-265	Four Rivers-Hanover 230 kV	Active
AF1-291	Tyler 34.5 kV	Engineering and Procurement
AF1-301	Louisa-South Anna 230 kV	Active
AF2-013	Arnold's Corner-Dahlgren 230 kV	Active
AF2-035	St. Johns 115 kV	Active
AF2-037	Louisa-North Anna 230 kV	Active
AF2-049	Ladysmith CT-St. Johns 230 kV	Active
AF2-054	Wan 34.5 kV	Active
AF2-063	Louisa-North Anna 230 kV	Active
AF2-065	Surry-Hopewell 230 kV	Active
AF2-077	White Marsh 34.5 kV	Active
AF2-085	Midlothian 34.5 kV	Engineering and Procurement
AF2-091	Oak Grove-Dahlgren 230 kV	Active
AF2-120	Garner-Northern Neck 115 kV	Active
AF2-255	Iron Bridge 34.5 kV	Engineering and Procurement
AF2-256	Tyler 34.5 kV	Engineering and Procurement
AF2-257	Tyler 34.5 kV	Active
AF2-258	Harrowgate 34.5 kV	Active
AF2-300	St. Johns 115 kV	Active

AF2-401	Culpeper 34.5 kV	Engineering and Procurement
AG1-000B	N/A	N/A
AG1-011	Colonial Trial 230 kV	Active
AG1-019	Arnold's Corner-Dahlgren 230 kV	Active
AG1-023	North Anna-Louisa 230 kV	Active
AG1-038	Garner DP-Lancaster 115 kV	Active
AG1-057	Harmony Village 230 kV	Active
AG1-064	Plaza 34.5 kV	Active
AG1-065	Plaza 34.5 kV	Active
AG1-075	Purdy-Sapony 115 kV	Active
AG1-081	Poolesville 34.5 kV	Withdrawn
AG1-102	White Marsh 34.5 kV	Active
AG1-133	North Anna-Ladysmith 500 kV	Active
AG1-134	Kings Dominion DP 115 kV	Active
AG1-135	Garner-Lancaster 115 kV	Active
AG1-145	Lightfoot 34.5 kV	Active
AG1-146	Garner DP-Lancaster 115 kV	Active
AG1-147	Garner DP-Lancaster 115 kV	Active
AG1-152	Remington CT 230 kV	Active
AG1-154	Ladysmith CT 230 kV	Active
AG1-171	Hopewell-Surry 230kV	Active
AG1-172	Hopewell-Surry 230 kV	Active
AG1-173	Hopewell-Surry 230 kV	Active
AG1-174	Hopewell-Surry 230 kV	Active
AG1-175	Hopewell-Surry 230 kV	Active
AG1-183	St. Johns DP-REC 115 kV	Active
AG1-187	St. Johns DP-REC 115 kV	Active
AG1-210	Northern Neck 34.5 kV	Active
AG1-213	St Johns 13.2 kV	Active
AG1-256	Northern Neck 230 kV	Active
AG1-282	Dunnsville 34.5 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
AG1-322	Birchwood 230 kV	Active
AG1-344	Culpeper 34.5 kV	Active
AG1-388	Dunnsville 34.5 kV	Active
AG1-412	Ladysmith CT-Mine Road 230 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
AG1-531	Poolesville-Winchester 230 kV	Active
AG1-536	Garner-Northern Neck 115 kV	Active
AG1-541	St. Johns 115 kV	Active
AG1-558	Buckner 34.5 kV	Active
AG1-559	Caroline Pines 22 kV	Active

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 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
DVP_P1-2: LN 574	CONTINGENCY 'DVP_P1-2: LN 574' OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH 500.00 END
DVP_P1-2: LN 568	CONTINGENCY 'DVP_P1-2: LN 568' OPEN BRANCH FROM BUS 314911 TO BUS 314922 CKT 1 /* 8LADYSMITH 500.00 - 8POSSUM 500.00 END
DVP_P4-2: 541T569	CONTINGENCY 'DVP_P4-2: 541T569' /* MORRISVILLE 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314929 CKT 1 /* 8MORRSVL 500.00 - 8FRONT ROYAL500.00 OPEN BRANCH FROM BUS 314913 TO BUS 314916 CKT 1 /* 8LOUDOUN 500.00 - 8MORRSVL 500.00 END
DVP_P1-2: LN 2090-B	CONTINGENCY 'DVP_P1-2: LN 2090-B' OPEN BRANCH FROM BUS 965440 TO BUS 314197 CKT 1 /* AG1-412 TAP 230.00 - 6LDYSMITH CT230.00 END
314212 6FOUR RIVERS 230 939750 AE1-206 TAP 230 1	CONTINGENCY '314212 6FOUR RIVERS 230 939750 AE1-206 TAP 230 1' OPEN BRANCH FROM BUS 314212 TO BUS 939750 CKT 1 END

Base Case	
DVP_P1-2: LN 2089	CONTINGENCY 'DVP_P1-2: LN 2089' OPEN BRANCH FROM BUS 314196 TO BUS 314197 CKT 1 /* 6LADYSMITH 230.00 - 6LDYSMITH CT230.00 END
DVP_P1-2: LN 569	CONTINGENCY 'DVP_P1-2: LN 569' OPEN BRANCH FROM BUS 314913 TO BUS 314916 CKT 1 /* 8LOUDOUN 500.00 - 8MORRSVL 500.00 END
DVP_P7-1: LN 569-2030-A	CONTINGENCY 'DVP_P7-1: LN 569-2030-A' /* . OPEN BRANCH FROM BUS 314913 TO BUS 314916 CKT 1 /* 8LOUDOUN 500.00 - 8MORRSVL 500.00 OPEN BRANCH FROM BUS 314037 TO BUS 962940 CKT 1 /* 6GAINSVL 230.00 - AG1-143 TAP 230.00 END
314222 6HANOVER 230 939750 AE1-206 TAP 230 1	CONTINGENCY '314222 6HANOVER 230 939750 AE1-206 TAP 230 1' OPEN BRANCH FROM BUS 314222 TO BUS 939750 CKT 1 END

12 Short Circuit Analysis

The following Breakers are overdutied:

None.

12.1 System Reinforcements - Short Circuit

None.

13 Affected Systems

13.1 TVA

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

13.2 Duke Energy Progress

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

14 Attachment 1: One Line Diagram