



# **Generation Interconnection**

## **Feasibility Study Report**

**for**

**Queue Project AF1-128**

**CHESTERFIELD 230 KV**

**569 MW Capacity / 569 MW Energy**

January, 2020

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## 1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between, the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Virginia Electric and Power Company (VEPCO).

## 2 Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances, a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

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.

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

Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

### 3 General

The Interconnection Customer (IC), has proposed a Natural Gas generating facility located in Chesterfield County, Virginia. The installed facilities will have a total capability of 569 MW with 569 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is 06/01/2023. This study does not imply a TO commitment to this in-service date.

The AF1-128 project has claimed 242.1 MW of Capacity Interconnection Rights from the deactivated Chesterfield units 3 and 4.

<b>Queue Number</b>	<b>AF1-128</b>
<b>Project Name</b>	CHESTERFIELD 230 KV
<b>State</b>	Virginia
<b>County</b>	Chesterfield
<b>Transmission Owner</b>	Dominion
<b>MFO</b>	569
<b>MWE</b>	569
<b>MWC</b>	569
<b>Fuel</b>	Natural Gas
<b>Basecase Study Year</b>	2023

#### 3.1 Primary Point of Interconnection

The AF1-128 project will interconnect with the Dominion transmission system. The primary Point of Interconnection (POI) is a direct connection at an existing Chesterfield Power station 230 kV. The IC is responsible for securing right-of-way, permits and constructing the proposed attachment line from the solar facility site to the proposed new substation. Attachment 1 shows a one-line diagram of the proposed interconnection facilities. The IC may not install any facilities on Dominion’s right-of-way without first obtaining the necessary approval from Dominion Energy.

### 3.2 Secondary Point of Interconnection

The AF1-128 project selected a secondary POI as a direct connection into the existing Chesterfield Power station 115 kV.

This report does not provide costs for the physical interconnection of the secondary point of interconnection. It was just analyzed for network impacts. Results are shown in the Network Impacts – Secondary Point of Interconnection section of this report.

### 3.3 Cost Summary

The AF1-128 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	\$ 2,100,000
Direct Connection Network Upgrade	\$ 0
Non Direct Connection Network Upgrades	\$ 2,400,000
<b>Total Costs</b>	<b>\$ 4,500,000</b>

In addition, the AF1-128 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	\$ 743,256,214

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

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

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

## 4 Transmission Owner Scope of Work

Dominion assessed the impact of the proposed Queue Project AF1-128. The project was evaluated as a 569 MW Capacity (569 MW Energy) injection at the existing Chesterfield Power station 230 kV substation in the Dominion Transmission System, for compliance with NERC Reliability Criteria on Dominion Transmission System. The system was assessed using the summer 2023 AF1 case provided to Dominion by PJM. When performing a generation analysis, Dominion's main analysis will be load flow study results under single contingency (both normal and stressed system conditions). Dominion Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. A full listing of Dominion's Planning Criteria and interconnection requirements can be found in the Company's Facility Connection Requirements which are publicly available at: <http://www.dominionenergy.com>.

The results of these studies evaluate the system under a limited set of operating conditions and do not guarantee the full delivery of the capacity and associated energy of this proposed generation facility under all operating conditions. NERC Planning and Operating Reliability Criteria allow for the re-dispatch of generating units to resolve projected and actual deficiencies in real time and planning studies. Specifically, in Planning Studies, NERC Planning Event 3 and 6 Contingency Conditions (Loss of generator, transmission circuit, transformer, shunt device, or Single Pole of a DC line followed by the loss of a generator, transmission circuit, transformer, shunt device or single pole of a DC line) allow for re-dispatch of generating units to resolve potential reliability deficiencies. For Dominion Planning Criteria the re-dispatch of generating units for these contingency conditions is allowed as long as the projected loading does not exceed 100% of a facility Load Dump Rating.

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of the AF1-128 generation project to the Dominion Transmission System is detailed in the following sections. The associated one-line with the generation project attachment facilities and primary direct and non-direct connection are shown in Attachment 1.

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

## 5 Attachment Facilities

To accommodate the proposed AF1-128 Project, Dominion Energy will install one span of overhead 230 kV line to the point of interconnection ("POI") including 230 kV interconnection metering.

The total preliminary cost estimate for the Attachment work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
<b>Substation (Metering)</b>	\$600,000
<b>Transmission (One-Span)</b>	\$1,500,000
<b>Total Attachment Facility Costs</b>	<b>\$2,100,000</b>

It is estimated to take 18-24 months to complete this work upon execution of an Interconnection Construction Service Agreement (ICSA). These preliminary cost estimates are based on typical engineering costs. A more detailed engineering cost estimates are normally done when the IC provides an exact site plan location for the generation substation during the Facility Study phase. See Attachment 1.

## 6 Direct Connection Cost Estimate

None

## 7 Non-Direct Connection Cost Estimate

To accommodate the proposed AF1-128 Project, Dominion Energy will add two new 230 kV breakers to the existing Chesterfield 230 kV substation to allow for the proposed interconnection.

The total preliminary cost estimate for the Non-Direct Connection work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
<b>Additional Substation Breakers (2) and Associated Equipment</b>	2,400,000
<b>Total Direct Connection Facility Costs</b>	<b>\$2,400,000</b>

It is estimated to take 24-30 months to complete this work upon execution of an Interconnection Construction Service Agreement (ICSA). These preliminary cost estimates are based on typical engineering costs. A more detailed engineering cost estimates are normally done when the IC provides an exact site plan location for the generation substation during the Facility Study phase. See Attachment 1.

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.

## 8 Schedule

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

## 9 Transmission Owner Analysis

### 9.1 Power Flow Analysis

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

### 9.2 Short Circuit Analysis

PJM performed a short circuit analysis and the results were verified by Dominion. The connection of AF1-128 project to the system does result in newly overdutied circuit breakers and does have a significant fault current contribution to an existing overdutied circuit breaker at the Chesterfield and Chickahominy substation on the Dominion transmission system. Please see the 'Short Circuit' section of the report for additional information.

### 9.3 Stability Analysis

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

## 10 Interconnection Customer Requirements

### 10.1 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.

## 10.2 Compliance Issues and Interconnection Customer Requirements

The proposed Customer Facilities must be designed in accordance with Dominion's "Dominion's Facility Interconnection Requirements" document located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>. In particular, the IC is responsible for the following:

1. The purchase and installation of a fully rated protection device (circuit breaker, circuit switcher, fuse) to protect the IC's GSU transformer(s).
2. The purchase and installation of the minimum required Dominion generation interconnection relaying and control facilities as described in the System Protection noted above. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.
3. The purchase and installation of supervisory control and data acquisition ("SCADA") equipment to provide information in a compatible format to the Dominion Transmission System Control Center.
4. Compliance with the Dominion and PJM generator power factor and voltage control requirements.

The GSU(s) associated with the IC queue request shall meet the grounding requirements as noted in Dominion's "Dominion's Facility Interconnection Requirements" document located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>.

The IC will also be required to meet all PJM, SERC, and NERC reliability criteria and operating procedures for standards compliance. For example, the IC will need to properly locate and report the over and under voltage and over and under frequency system protection elements for its units as well as the submission of the generator model and protection data required to satisfy the PJM and SERC audits. Failure to comply with these requirements may result in a disconnection of service if the violation is found to compromise the reliability of the Dominion system.

## 10.3 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.

# 11 Revenue Metering and SCADA Requirements

## 11.1 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.

## 11.2 Dominion Requirements

See Section 3.4.6 “Metering and telecommunications” of Dominion’s “Dominion’s Facility Interconnection Requirements” document located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>.

## 12 Network Impacts – Primary Point of Interconnection

The Queue Project AF1-128 was evaluated as a 306.9 MW (Capacity 306.9 MW) injection at the Chesterfield 230 kV substation in the Dominion area. The AF1-128 project has claimed 242.1 MW of Capacity Interconnection Rights from the deactivated Chesterfield units 3 and 4. The installed facilities will have a total capability of 569 MW with 569 MW of this output being recognized by PJM as Capacity. Project AF1-128 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-128 was studied with a commercial probability of 53%. Potential network impacts were as follows:

# Summer Peak Load Flow

## 12.1 Generation Deliverability

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

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 LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
42883406	314908	8ELMONT	500.0	DVP	314911	8LADYSMIT H	500.0	DVP	1	DVP_P1-2: LN 534	single	4070.2	99.3	101.47	DC	108.22

## 12.2 Multiple Facility Contingency

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

None

## 12.3 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 LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
42883244	314903	8CHCKAHM	500.0	DVP	314908	8ELMONT	500.0	DVP	1	DVP_P1-2: LN 576	single	2442.12	162.6	162.73	DC	74.19
42883252	314903	8CHCKAHM	500.0	DVP	314908	8ELMONT	500.0	DVP	1	Base Case	single	2442.12	134.19	134.53	DC	60.6
46130895	314903	8CHCKAHM	500.0	DVP	314908	8ELMONT	500.0	DVP	1	DVP_P1-2: LN 208	single	2442.12	139.21	139.65	DC	72.17
42883148	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P4-2: H1T594	breaker	3351.0	105.99	106.01	DC	61.56
42883149	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P4-2: 573T594	breaker	3351.0	105.41	105.43	DC	61.44
42883298	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1-2: LN 594	single	2442.12	141.43	141.56	DC	61.46
42883300	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1-2: LN 573	single	2442.12	136.49	137.17	DC	60.39
42883403	314908	8ELMONT	500.0	DVP	314911	8LADYSMIT H	500.0	DVP	1	DVP_P1-2: LN 576	single	4070.2	115.35	115.86	DC	104.14
42883133	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P4-2: SPOTS H1T594	breaker	3351.0	110.48	110.5	DC	62.31
42883134	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P4-2: H1T594	breaker	3351.0	106.11	106.13	DC	60.61
42883168	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P4-2: 545T552	breaker	3637.0	101.91	101.93	DC	56.84
42883327	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1-2: LN 573	single	2442.12	130.31	130.91	DC	52.46

ID	FROM BUS#	FROM BUS	kV	FRO M BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
42883328	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1 -2: LN 594	single	2442.12	130.19	130.85	DC	52.35
42883340	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1 -2: LN 573	single	2738.22	127.66	127.77	DC	62.58
42883341	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1 -2: LN 594	single	2738.22	126.54	126.66	DC	60.53
42883263	314914	8MDLTHAN	500.0	DVP	314918	8NO ANNA	500.0	DVP	1	DVP_P1 -2: LN 574	single	2442.12	150.45	150.66	DC	73.9
42883442	314916	8MORRSVL	500.0	DVP	314913	8LOUDOUN	500.0	DVP	1	DVP_P1 -2: LN 580	single	2738.22	107.02	107.55	DC	38.86
42883420	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1 -2: LN 581	single	3218.56	115.36	115.41	DC	64.39
42883423	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1 -2: LN 552	single	3218.56	112.4	112.45	DC	63.1
42883458	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P1 -2: LN 569	single	2442.12	103.79	103.85	DC	37.39
42883354	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1 -2: LN 552	single	3218.56	120.09	120.13	DC	63.61
42883355	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1 -2: LN 581	single	3218.56	119.17	119.22	DC	62.62

## 12.4 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	FRO M BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
42883297	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1 -2: LN 594	operatio n	2442.12	144.6	144.62	DC	61.46
42883402	314908	8ELMONT	500.0	DVP	314911	8LADYSMIT H	500.0	DVP	1	DVP_P1 -2: LN 576	operatio n	4070.2	119.96	120.02	DC	104.14
42883321	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1 -2: LN 581	operatio n	2442.12	137.96	138.0	DC	54.75
42883331	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	Base Case	operatio n	2442.12	108.23	108.25	DC	41.8

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 LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
42883338	314911	8LADYSMITH	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1-2: LN 594	operation	2738.22	129.23	129.25	DC	60.53
42883441	314916	8MORRSL	500.0	DVP	314913	8LOUDOUN	500.0	DVP	1	DVP_P1-2: LN 580	operation	2738.22	110.98	110.99	DC	38.86
42883457	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P1-2: LN 569	operation	2442.12	108.13	108.35	DC	37.39

## 12.5 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
42883168,42883327,42883328	5	8LADYSMITH 500.0 kV - 8POSSUM 500.0 kV Ckt 1	<p><b>DVP</b>  n6063 : Replace wavetraps at Ladysmith and Possum Pt 500 kV substations.  Project Type : FAC  Cost : \$300,000  Time Estimate : 16-18 Months</p> <p>n6157 : Relay Change Outs (CT) at Ladysmith and Possum Pt 500 kV substations.  Project Type : FAC  Cost : \$120,000  Time Estimate : 6-12 Months</p>	\$420,000
42883458	9	8OX 500.0 kV - 8CLIFTON 500.0 kV Ckt 1	<p><b>DVP</b>  n6161 : Replace wavetraps at Ox and Clifton 500 kV substations.  Project Type : FAC  Cost : \$300,000  Time Estimate : 16-18 Months</p>	\$300,000
42883340,42883134,42883133,42883341	4	8LADYSMITH 500.0 kV - 8CHANCE 500.0 kV Ckt 1	<p><b>DVP</b>  b3021 : PJM baseline upgrade b3021: Rebuild 500kV Line #581 Ladysmith to Chancellor - 15.2 miles long. The baseline project has an projected in-service date of 12/31/2023.  Project Type : FAC  Cost : \$0  Time Estimate : N/A Months</p>	\$0
42883252,42883244,46130895	2	8CHCKAHM 500.0 kV - 8ELMONT 500.0 kV Ckt 1	<p><b>DVP</b>  n6207 : Rebuild 27.72 miles of 500 kV Line 557 from Chickahominy to Elmont with 3-1351.5 113C ACSR.  Project Type : FAC  Cost : \$85,932,000  Time Estimate : 48-60 Months</p>	\$85,932,000

ID	Index	Facility	Upgrade Description	Cost
42883263	6	8MDLTHAN 500.0 kV - 8NO ANNA 500.0 kV Ckt 1	<p><u>DVP</u> n6055 : Replace wavetraps at Milothian and North Anna 500kV substations Project Type : FAC Cost : \$300,000 Time Estimate : 16-18 Months</p> <p>n5609 : Rebuild 41.13 miles of 500 kV Line 576 from Midlothian to North Anna with 3-1351.5 125C ACSR.. Project Type : FAC Cost : \$ 127,503,000 Time Estimate : 48-60 Months</p>	\$127,803,000
42883355,42883354	10	8SPOTSYL 500.0 kV - 8MORRSVL 500.0 kV Ckt 1	<p><u>DVP</u> n6160 : Rebuild 18.75 miles of 500 kV Line 594 from Spotsylvania to Morrisville with 3-1351.5 113C ACSR. Project Type : FAC Cost : \$58,125,000 Time Estimate : 48-60 Months</p>	\$58,125,000
42883442	7	8MORRSVL 500.0 kV - 8LOUDOUN 500.0 kV Ckt 1	<p><u>DVP</u> dom-181 : Rebuild 8.1 miles of 500 kV Line 569 from Morrisville to Loudoun with 1351.5 ACSR. Replace Wave Trap, CT, and Relay at Loudoun. Replace wavetraps at Morrisville. Project Type : FAC Cost : \$25,830,000 Time Estimate : 42-48 Months</p>	\$25,830,000
42883406,42883403	1	8ELMONT 500.0 kV - 8LADYSMITH 500.0 kV Ckt 1	<p><u>DVP</u> b3020 : PJM baseline upgrade b3020: Rebuild 500kV Line #574 Ladysmith to Elmont - 26.2 miles long. The baseline project has a projected in-service date of 12/31/2022. Project Type : FAC Cost : \$0 Time Estimate : N/A Months</p> <p>dom-183 : Build new 500 kV Line from Rawlings to Morrisville Substation 110 miles Project Type : CON Cost : \$400,000,000 Time Estimate : 60-72 Months</p>	\$400,000,000
42883300,42883298, 42883148,42883149	3	8CHANCE 500.0 kV - 8BRISTER 500.0 kV Ckt 1	<p><u>DVP</u> b3019 : PJM baseline upgrade b3019: Rebuild 500kV Line #552 Bristers to Chancellor 21.6 miles long. The baseline project has an projected in-service date of 12/31/2023. Project Type : FAC Cost : \$0 Time Estimate : N/A Months</p>	\$0

ID	Index	Facility	Upgrade Description	Cost
42883420,42883423	8	8NO ANNA 500.0 kV - 8SPOTSYL 500.0 kV Ckt 1	<u>DVP</u> n6132 : Rebuild 14.02 miles of 500 kV Line 573 from North Anna to Spotsylvania with 3-1351.5 113C ACSR. Project Type : FAC Cost : \$43,462,000 Time Estimate : 48-60 Months	\$43,462,000
			TOTAL COST	<b>\$741,872,000</b>

## 12.6 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

### 12.6.1 Contingency Descriptions

Contingency Name	Contingency Definition
<b>DVP_P1-2: LN 552</b>	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
<b>DVP_P4-2: 573T594</b>	CONTINGENCY 'DVP_P4-2: 573T594' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 END
<b>DVP_P1-2: LN 594</b>	CONTINGENCY 'DVP_P1-2: LN 594' OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 END
<b>DVP_P1-2: LN 580</b>	CONTINGENCY 'DVP_P1-2: LN 580' OPEN BRANCH FROM BUS 235110 TO BUS 314929 CKT 1 /* 01MDWBRK 500.00 - 8FRONT ROYAL500.00 END
<b>DVP_P1-2: LN 581</b>	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
<b>DVP_P1-2: LN 573</b>	CONTINGENCY 'DVP_P1-2: LN 573' OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
<b>DVP_P1-2: LN 208</b>	CONTINGENCY 'DVP_P1-2: LN 208' OPEN BRANCH FROM BUS 314286 TO BUS 314309 CKT 1 /* 6CHESTF A 230.00 - 6IRON208 230.00 OPEN BRANCH FROM BUS 314309 TO BUS 314338 CKT 1 /* 6IRON208 230.00 - 6SOUWEST 230.00 OPEN BUS 314309 /* ISLAND: 6IRON208 230.00 END
<b>DVP_P1-2: LN 569</b>	CONTINGENCY 'DVP_P1-2: LN 569' OPEN BRANCH FROM BUS 314913 TO BUS 314916 CKT 1 /* 8LOUDOUN 500.00 - 8MORRSVL 500.00 END
<b>DVP_P1-2: LN 574</b>	CONTINGENCY 'DVP_P1-2: LN 574' OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH 500.00 END
<b>DVP_P1-2: LN 576</b>	CONTINGENCY 'DVP_P1-2: LN 576' OPEN BRANCH FROM BUS 314914 TO BUS 314918 CKT 1 /* 8MDLTHAN 500.00 - 8NO ANNA 500.00 END
<b>DVP_P1-2: LN 534</b>	CONTINGENCY 'DVP_P1-2: LN 534' OPEN BRANCH FROM BUS 314907 TO BUS 314910 CKT 1 /* 8DOOMS 500.00 - 8CUNINGHAM 500.00 END
<b>DVP_P4-2: H1T594</b>	CONTINGENCY 'DVP_P4-2: H1T594' /* MORRISVILLE 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314063 TO BUS 314916 CKT 1 /* 6MORRSVL 230.00 - 8MORRSVL 500.00 OPEN BUS 314897 /* 8MORRS_1 500.00 KV END
<b>Base Case</b>	
<b>DVP_P4-2: SPOTS H1T594</b>	CONTINGENCY 'DVP_P4-2: SPOTS H1T594' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1 /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
DVP_P4-2: 545T552	CONTINGENCY 'DVP_P4-2: 545T552' /* BRISTERS 500 KV OPEN BRANCH FROM BUS 314900 TO BUS 314916 CKT 1 /* 8BRISTER 500.00 - 8MORRSVL 500.00 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

## 12.6.2 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
42883403	314908	8ELMONT	DVP	314911	8LADYSMITH	DVP	1	DVP_P1-2: LN 576	single	4070.2	115.35	115.86	DC	104.14

Bus #	Bus	MW Impact
314229	6MT RD221	0.1930
314236	6NRTHEST	0.2940
314241	6OLDCHRC	1.2143
314309	6IRON208	0.7011
314421	6WINCHST	0.2096
315058	1CHESTF3 (Deativation : 12/13/18)	28.2727
315059	1CHESTF4 (Deativation : 12/13/18)	53.9177
315060	1CHESTF5	15.9520
315061	1CHESTG7	6.1904
315062	1CHESTS7	2.8418
315063	1CHESTG8	6.0909
315064	1CHESTS8	3.1354
315067	1DARBY 1	4.0713
315068	1DARBY 2	4.0760
315069	1DARBY 3	4.0903
315070	1DARBY 4	4.0951
315074	1HOPCGN1 (Deativation : 06/25/19)	13.0619
315075	1HOPCGN2 (Deativation : 06/25/19)	12.8927
315083	1SPRUNCA (Deativation : 01/12/19)	16.1058
315084	1SPRUNCB (Deativation : 01/12/19)	16.1058
315090	1YORKTN1 (Deativation : 09/09/18)	53.1012
315091	1YORKTN2 (Deativation : 09/09/18)	55.1051
315092	1YORKTN3	36.7912
315233	1SURRY 2	40.1029
923801	AB2-015 C OP	12.6565
923831	AB2-022 C	3.4963
924241	AB2-068 OP	429.9996
925051	AB2-160 C O1	8.3605
925061	AB2-161 C O1	5.1414
925331	AB2-190 C	31.4170
925861	AC1-065 C	5.0333
926291	AC1-107 O1	649.0560
926661	AC1-147 C	3.4729

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
926751	AC1-161 C O1	47.2230
926781	AC1-164 C	77.2469
927041	AC1-191 C O1	14.4508
927221	AC1-216 C O1	15.3630
932041	AC2-012 C	15.7109
932501	AC2-070 C	3.2142
932581	AC2-078 C O1	6.2002
932591	AC2-079 C O1	8.7208
932831	AC2-110 C	2.0133
933061	AC2-130	0.6252
933261	AC2-137 C	3.9506
933291	AC2-141 C	47.2230
933731	AC2-196 C	2.7450
934011	AD1-025 C	26.4087
934061	AD1-033 C	11.5315
934141	AD1-041 C	7.8400
934521	AD1-076 C	78.9163
934571	AD1-082 C	11.7169
935111	AD1-144 C	2.6524
935161	AD1-151 C O1	25.2458
935211	AD1-156 C	3.2067
936041	AD2-007 C	1.2616
936051	AD2-008 C	4.5977
936151	AD2-021	0.4505
936301	AD2-039 C	2.0133
936661	AD2-085 C	5.2330
936711	AD2-090 C O1	10.4323
936761	AD2-097 C	3.0546
937221	AD2-160 C O1	8.9531
937251	AD2-164	7.5393
937541	AD2-215 C	2.6798
938031	AE1-004 C	2.0133
938181	AE1-027 C	3.5887
938191	AE1-028 C	2.0820
938491	AE1-068 C O1	47.5194
938531	AE1-072 C O1	26.7890
938551	AE1-074 C	3.6104
938631	AE1-085 C O1	13.5873
938771	AE1-103 C O1	5.3602
939191	AE1-149 C O1	16.3307

Bus #	Bus	MW Impact
939311	AE1-162 C	3.3330
939411	AE1-173 C	126.8635
939421	AE1-174 C	0.6815
939431	AE1-175 C	4.5317
939611	AE1-191 C	15.6800
940061	AE2-000BC O1	24.3538
940071	AE1-249 C (Withdrawn : 01/10/2020)	11.0282
940231	AE2-005 C	2.0133
940251	AE2-007 O1	266.7649
940431	AE2-027 C O1	20.0191
940471	AE2-031 C	43.0714
940481	AE2-033 C	22.5081
940491	AE2-034 C	6.5332
940541	AE2-040 O1	2.3807
940551	AE2-041 O1	10.7600
940641	AE2-051 C O1	23.4809
940651	AE2-052	2.8851
940891	AE2-078 C	3.6910
940901	AE2-079 C	3.6910
940911	AE2-080 C	3.6910
941031	AE2-094 C	51.5873
941101	AE2-104 C O1	5.3033
941281	AE2-122 C O1	23.1526
941291	AE2-123 C O1	23.7937
941301	AE2-124 C O1	21.6312
941501	AE2-147 C	23.9338
941581	AE2-155 C	1.2228
941591	AE2-156 O1	27.5697
941601	AE2-157 C	16.2680
942001	AE2-212 C	3.2993
942131	AE2-225 C	3.2554
942151	AE2-227 C	4.0452
942161	AE2-228 C	3.3363
942171	AE2-229 C	3.2554
942341	AE2-247 C	1.2022
942371	AE2-250 C O1	14.8509
942401	AE2-253 C	9.4171
942551	AE2-270	42.0763
942851	AE2-304 C	0.9481
942931	AE2-313 C	46.6360

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
943431	AF1-014 C	1.0109
943451	AF1-016 C O1	1.1015
943461	AF1-017 C	1.0877
943471	AF1-018	5.7028
943611	AF1-032 C	1.4091
943621	AF1-033 C	1.9563
944011	AF1-069 C	8.9334
944051	AF1-073 C O1	15.6504
944061	AF1-074 C O1	5.8676
944501	AF1-115 C O1	5.9577
944581	AF1-123 C O1	35.5900
944591	AF1-124 C O1	35.5900
944601	AF1-125 C O1	35.5900
944631	AF1-128 O1	104.1373
944641	AF1-129 O1	193.0731
944871	AF1-152 C	4.2283
945361	AF1-201 C O1	13.1354
945711	AF1-236 C O1	61.3051
946011	AF1-266	9.9858
946261	AF1-291 C	1.7687
LGEE	LGEE	3.3055
CPL	CPL	12.7173
WEC	WEC	1.7029
CBM-W2	CBM-W2	62.5552
NY	NY	3.9197
CBM-W1	CBM-W1	63.0504
TVA	TVA	12.8758
CBM-S2	CBM-S2	91.7228
CBM-S1	CBM-S1	72.9653
MADISON	MADISON	2.8022
MEC	MEC	9.9249
AA2-074	AA2-074	8.6769

### 12.6.3 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
42883244	314903	8CHCKAHM	DVP	314908	8ELMONT	DVP	1	DVP_P1-2: LN 576	single	2442.12	162.6	162.73	DC	74.19

Bus #	Bus	MW Impact
314295	6BIRDNECK	0.0656
314421	6WINCHST	0.2047
314491	3PENDLTN	0.4897
314507	3THOMPSN	0.4927
315090	1YORKTN1 (Deativation : 09/09/18)	52.4144
315091	1YORKTN2 (Deativation : 09/09/18)	54.3923
315092	1YORKTN3	36.4168
315098	1CHESPKA	0.6516
315099	1CHESPKB (Deativation : 05/31/19)	4.9651
315108	1ELIZAR1	4.7969
315109	1ELIZAR2	4.7136
315110	1ELIZAR3	4.8583
315233	1SURRY 2	43.5314
315260	1GOSPORTA	0.5201
315261	1GOSPORTB	0.6644
315262	1GOSPORTC	0.5638
315294	1DOMTR10	13.7166
315603	6AA1-139SOLA	3.6259
923801	AB2-015 C OP	11.2336
923831	AB2-022 C	3.3409
924241	AB2-068 OP	620.1848
925061	AB2-161 C O1	4.2772
925331	AB2-190 C	24.6682
925861	AC1-065 C	4.5645
926291	AC1-107 O1	936.1280
926661	AC1-147 C	3.9476
926751	AC1-161 C O1	57.1342
926781	AC1-164 C	68.8476
927221	AC1-216 C O1	12.2082
932041	AC2-012 C	17.8581
932591	AC2-079 C O1	7.6130
932831	AC2-110 C	1.8258

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
933261	AC2-137 C	2.5139
933291	AC2-141 C	57.1342
933731	AC2-196 C	3.1363
933991	AD1-023 C	16.8692
934011	AD1-025 C	20.9855
934061	AD1-033 C	13.1704
934141	AD1-041 C	7.2045
934521	AD1-076 C	70.6566
934571	AD1-082 C	9.7474
935111	AD1-144 C	2.5090
935161	AD1-151 C O1	19.8227
936041	AD2-007 C	1.0025
936051	AD2-008 C	3.6535
936151	AD2-021	0.2867
936301	AD2-039 C	1.8258
936401	AD2-051 C O1	10.8660
936661	AD2-085 C	4.5584
936711	AD2-090 C O1	9.1281
937221	AD2-160 C O1	10.1847
937251	AD2-164	8.6775
937541	AD2-215 C	2.5349
938031	AE1-004 C	1.8258
938171	AE1-026 C O1	40.8767
938181	AE1-027 C	4.0939
938191	AE1-028 C	2.3751
938221	AE1-035 C	2.7874
938491	AE1-068 C O1	67.2170
938501	AE1-069 C O1	52.5735
938531	AE1-072 C O1	30.3629
938771	AE1-103 C O1	4.7870
939311	AE1-162 C	3.0398
939411	AE1-173 C	116.2392
939421	AE1-174 C	0.6590
939431	AE1-175 C	4.3825
939611	AE1-191 C	14.4090
940061	AE2-000BC O1	20.2603
940231	AE2-005 C	1.8258
940251	AE2-007 O1	303.8458
940471	AE2-031 C	36.6452
940491	AE2-034 C	5.9469

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940551	AE2-041 O1	9.9307
940641	AE2-051 C O1	21.0375
940891	AE2-078 C	3.2976
940901	AE2-079 C	3.2976
940911	AE2-080 C	3.2976
941031	AE2-094 C	44.0564
941101	AE2-104 C O1	4.9162
941281	AE2-122 C O1	49.7850
941291	AE2-123 C O1	51.1635
941301	AE2-124 C O1	46.5251
941501	AE2-147 C	22.6356
941591	AE2-156 O1	31.3660
941601	AE2-157 C	12.9443
942131	AE2-225 C	3.1060
942171	AE2-229 C	3.1060
942341	AE2-247 C	1.0463
942401	AE2-253 C	10.7126
942551	AE2-270	33.0378
942851	AE2-304 C	0.8915
942931	AE2-313 C	39.6779
943431	AF1-014 C	0.9167
943451	AF1-016 C O1	1.0211
943461	AF1-017 C	0.9466
943471	AF1-018	5.2633
943611	AF1-032 C	1.3444
943621	AF1-033 C	1.7477
944011	AF1-069 C	7.6293
944051	AF1-073 C O1	14.0124
944061	AF1-074 C O1	4.5837
944501	AF1-115 C O1	5.3226
944581	AF1-123 C O1	77.5986
944591	AF1-124 C O1	77.5986
944601	AF1-125 C O1	77.5986
944631	AF1-128 O1	12.3771
944641	AF1-129 O1	61.9637
944871	AF1-152 C	3.9990
945361	AF1-201 C O1	28.3914
945711	AF1-236 C O1	55.8035
LGEE	LGEE	1.0577
CPL	CPL	9.1843

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>WEC</b>	<b>WEC</b>	<b>0.5450</b>
<b>CBM-W2</b>	<b>CBM-W2</b>	<b>27.6249</b>
<b>NY</b>	<b>NY</b>	<b>1.8874</b>
<b>CBM-W1</b>	<b>CBM-W1</b>	<b>19.3279</b>
<b>TVA</b>	<b>TVA</b>	<b>6.2608</b>
<b>CBM-S2</b>	<b>CBM-S2</b>	<b>60.4588</b>
<b>CBM-S1</b>	<b>CBM-S1</b>	<b>33.9522</b>
<b>MADISON</b>	<b>MADISON</b>	<b>2.2539</b>
<b>MEC</b>	<b>MEC</b>	<b>3.7198</b>
<b>AA2-074</b>	<b>AA2-074</b>	<b>6.2541</b>

### 12.6.4 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
42883298	314905	8CHANCE	DVP	314900	8BRISTER	DVP	1	DVP_P1-2: LN 594	single	2442.12	141.43	141.56	DC	61.46

Bus #	Bus	MW Impact
314229	6MT RD221	0.1155
314236	6NRTHEST	0.1759
314241	6OLDCHRC	0.7115
314250	6ROCKVILLE	0.3134
315037	1LDYSMT1	4.5502
315038	1LDYSMT2	4.5472
315039	1LDYSMT3	4.8122
315040	1LDYSMT4	4.8212
315041	1LDYSMT5	4.8362
315043	1FOUR RIVERA	2.8433
315044	1FOUR RIVERB	2.8433
315045	1FOUR RIVERC	3.4882
315046	1FOUR RIVERD	2.8433
315047	1FOUR RIVERE	2.8433
315048	1FOUR RIVERF	3.4882
315058	1CHESTF3 (Deactivation : 12/13/18)	16.9907
315059	1CHESTF4 (Deactivation : 12/13/18)	27.5418
315067	1DARBY 1	2.4228
315068	1DARBY 2	2.4256
315069	1DARBY 3	2.4341
315070	1DARBY 4	2.4370
315074	1HOPCGN1 (Deactivation : 06/25/19)	7.7801
315075	1HOPCGN2 (Deactivation : 06/25/19)	7.6793
315083	1SPRUNCA (Deactivation : 01/12/19)	9.8906
315084	1SPRUNCB (Deactivation : 01/12/19)	9.8906
315090	1YORKTN1 (Deactivation : 09/09/18)	26.3583
315091	1YORKTN2 (Deactivation : 09/09/18)	27.3530
315225	1N ANNA1	33.4800
315226	1N ANNA2	33.4940
315610	6AA1-145GAS	9.9662
923831	AB2-022 C	2.0652
924061	AB2-050	0.5862
924241	AB2-068 OP	220.6920

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925051	AB2-160 C O1	5.0504
925061	AB2-161 C O1	3.0683
925331	AB2-190 C	18.6354
925861	AC1-065 C	3.1213
926001	AC1-076 C	3.8518
926291	AC1-107 O1	333.1200
926551	AC1-134	1.4656
926661	AC1-147 C	2.0487
926731	AC1-158 C	87.8897
926751	AC1-161 C O1	27.6533
926781	AC1-164 C	37.7875
927041	AC1-191 C O1	9.0494
927221	AC1-216 C O1	9.1092
932041	AC2-012 C	9.2680
932501	AC2-070 C	1.8832
932581	AC2-078 C O1	3.7266
932591	AC2-079 C O1	5.1879
932831	AC2-110 C	1.2485
933011	AC2-125	3.2145
933021	AC2-126	3.2361
933261	AC2-137 C	2.3025
933291	AC2-141 C	27.6533
933731	AC2-196 C	1.6195
934011	AD1-025 C	15.6585
934061	AD1-033 C	6.8033
934141	AD1-041 C	4.9044
934571	AD1-082 C	6.9926
935111	AD1-144 C	1.5659
935161	AD1-151 C O1	14.9749
935211	AD1-156 C	1.9463
936041	AD2-007 C	0.7480
936051	AD2-008 C	2.7261
936151	AD2-021	0.2626
936301	AD2-039 C	1.2485
936661	AD2-085 C	3.1136
936761	AD2-097 C	1.8758
937221	AD2-160 C O1	5.2838
937251	AD2-164	4.4117
937541	AD2-215 C	1.5820
938031	AE1-004 C	1.2485

Bus #	Bus	MW Impact
938181	AE1-027 C	2.1175
938191	AE1-028 C	1.2285
938491	AE1-068 C O1	40.3589
938531	AE1-072 C O1	15.8149
938551	AE1-074 C	2.2693
938631	AE1-085 C O1	8.1583
939191	AE1-149 C O1	9.8282
939261	AE1-157 C O1	16.6554
939271	AE1-158 C O1	16.9980
939311	AE1-162 C	1.9677
939411	AE1-173 C	77.3976
939421	AE1-174 C	0.3358
939431	AE1-175 C	2.2331
939611	AE1-191 C	9.8088
939751	AE1-206 C O1	35.8245
940061	AE2-000BC O1	14.5342
940071	AE1-249 C (Withdrawn : 01/10/2020)	6.6619
940231	AE2-005 C	1.2485
940251	AE2-007 O1	157.3613
940431	AE2-027 C O1	12.0680
940471	AE2-031 C	26.8498
940481	AE2-033 C	13.7032
940541	AE2-040 O1	1.4506
940551	AE2-041 O1	6.6008
940641	AE2-051 C O1	14.4914
940651	AE2-052	1.7363
940891	AE2-078 C	2.1768
940901	AE2-079 C	2.1768
940911	AE2-080 C	2.1768
941031	AE2-094 C	32.1525
941101	AE2-104 C O1	3.1415
941281	AE2-122 C O1	13.6597
941291	AE2-123 C O1	14.0380
941301	AE2-124 C O1	12.7624
941381	AE2-134	2.6542
941501	AE2-147 C	14.1494
941581	AE2-155 C	0.7164
941591	AE2-156 O1	16.2631
941601	AE2-157 C	9.7364
942001	AE2-212 C	1.9956

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942131	AE2-225 C	1.9240
942151	AE2-227 C	2.0543
942161	AE2-228 C	2.0129
942171	AE2-229 C	1.9240
942191	AE2-231 C O1	6.3933
942341	AE2-247 C	0.7153
942371	AE2-250 C O1	8.9712
942401	AE2-253 C	5.5577
942551	AE2-270	24.9581
942851	AE2-304 C	0.5607
942931	AE2-313 C	29.0718
943431	AF1-014 C	0.6269
943451	AF1-016 C O1	0.6525
943461	AF1-017 C	0.6472
943471	AF1-018	3.4984
943611	AF1-032 C	0.8328
943621	AF1-033 C	1.1537
944011	AF1-069 C	5.5679
944061	AF1-074 C O1	3.5158
944501	AF1-115 C O1	3.5135
944581	AF1-123 C O1	20.9861
944591	AF1-124 C O1	20.9861
944601	AF1-125 C O1	20.9861
944631	AF1-128 O1	27.6876
944641	AF1-129 O1	51.3335
944871	AF1-152 C	2.4997
945361	AF1-201 C O1	7.8605
946001	AF1-265	31.4250
946011	AF1-266	6.0795
946261	AF1-291 C	1.0669
LGEE	LGEE	1.2933
CPL	CPL	7.4293
WEC	WEC	0.6398
CBM-W2	CBM-W2	28.5913
NY	NY	2.5703
CBM-W1	CBM-W1	22.5931
TVA	TVA	6.3112
CBM-S2	CBM-S2	51.8235
CBM-S1	CBM-S1	34.8553
MADISON	MADISON	1.8588

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>MEC</b>	MEC	4.0996
<b>AA2-074</b>	AA2-074	5.0625

## 12.6.5 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
42883340	314911	8LADYSMITH	DVP	314905	8CHANCE	DVP	1	DVP_P1-2: LN 573	single	2738.22	127.66	127.77	DC	62.58

Bus #	Bus	MW Impact
314229	6MT RD221	0.1177
314236	6NRTHEST	0.1792
314241	6OLDCHRC	0.7252
314250	6ROCKVILLE	0.3187
315037	1LDYSMT1	4.6717
315038	1LDYSMT2	4.6686
315039	1LDYSMT3	4.9407
315040	1LDYSMT4	4.9499
315041	1LDYSMT5	4.9654
315043	1FOUR RIVERA	2.9044
315044	1FOUR RIVERB	2.9044
315045	1FOUR RIVERC	3.5631
315046	1FOUR RIVERD	2.9044
315047	1FOUR RIVERE	2.9044
315048	1FOUR RIVERF	3.5631
315058	1CHESTF3 (Deativation : 12/13/18)	17.2992
315059	1CHESTF4 (Deativation : 12/13/18)	28.0420
315067	1DARBY 1	2.4679
315068	1DARBY 2	2.4708
315069	1DARBY 3	2.4795
315070	1DARBY 4	2.4823
315074	1HOPCGN1 (Deativation : 06/25/19)	7.9182
315075	1HOPCGN2 (Deativation : 06/25/19)	7.8156
315083	1SPRUNCA (Deativation : 01/12/19)	10.0577
315084	1SPRUNCB (Deativation : 01/12/19)	10.0577
315090	1YORKTN1 (Deativation : 09/09/18)	26.8273
315091	1YORKTN2 (Deativation : 09/09/18)	27.8396
315225	1N ANNA1	34.0122
315226	1N ANNA2	34.0265
315610	6AA1-145GAS	10.1803
923831	AB2-022 C	2.0995
924061	AB2-050	0.5988
924241	AB2-068 OP	225.0274

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925051	AB2-160 C O1	5.1383
925061	AB2-161 C O1	3.1199
925331	AB2-190 C	18.9629
925861	AC1-065 C	3.1812
926291	AC1-107 O1	339.6640
926551	AC1-134	1.4971
926661	AC1-147 C	2.0833
926731	AC1-158 C	-58.9775
926751	AC1-161 C O1	28.1222
926781	AC1-164 C	45.2971
927041	AC1-191 C O1	9.2305
927221	AC1-216 C O1	9.2690
932041	AC2-012 C	9.4245
932501	AC2-070 C	1.9197
932581	AC2-078 C O1	3.7900
932591	AC2-079 C O1	5.2744
932831	AC2-110 C	1.2725
933011	AC2-125	3.3003
933021	AC2-126	3.3225
933261	AC2-137 C	2.3458
933291	AC2-141 C	28.1222
933731	AC2-196 C	1.6466
934011	AD1-025 C	15.9331
934061	AD1-033 C	6.9176
934141	AD1-041 C	4.9990
934571	AD1-082 C	7.1100
935111	AD1-144 C	1.5924
935161	AD1-151 C O1	15.2380
935211	AD1-156 C	1.9791
936041	AD2-007 C	0.7611
936051	AD2-008 C	2.7739
936151	AD2-021	0.2675
936301	AD2-039 C	1.2725
936661	AD2-085 C	3.1655
936761	AD2-097 C	1.9075
937221	AD2-160 C O1	5.3722
937251	AD2-164	4.4898
937541	AD2-215 C	1.6088
938031	AE1-004 C	1.2725
938181	AE1-027 C	2.1530

Bus #	Bus	MW Impact
938191	AE1-028 C	1.2490
938491	AE1-068 C O1	49.9658
938531	AE1-072 C O1	16.0781
938551	AE1-074 C	2.3046
938631	AE1-085 C O1	8.2964
939191	AE1-149 C O1	9.9950
939261	AE1-157 C O1	17.0748
939271	AE1-158 C O1	17.4259
939311	AE1-162 C	2.0014
939411	AE1-173 C	78.6338
939421	AE1-174 C	0.3419
939431	AE1-175 C	2.2738
939611	AE1-191 C	9.9980
939751	AE1-206 C O1	36.5786
940061	AE2-000BC O1	14.7783
940071	AE1-249 C (Withdrawn : 01/10/2020)	6.7778
940231	AE2-005 C	1.2725
940251	AE2-007 O1	160.0096
940431	AE2-027 C O1	12.2816
940471	AE2-031 C	27.2447
940481	AE2-033 C	13.9173
940541	AE2-040 O1	1.4734
940551	AE2-041 O1	6.7276
940641	AE2-051 C O1	14.7194
940651	AE2-052	1.7658
940891	AE2-078 C	2.2146
940901	AE2-079 C	2.2146
940911	AE2-080 C	2.2146
941031	AE2-094 C	32.6350
941101	AE2-104 C O1	3.1936
941281	AE2-122 C O1	13.8888
941291	AE2-123 C O1	14.2734
941301	AE2-124 C O1	12.9764
941501	AE2-147 C	14.3812
941581	AE2-155 C	0.7303
941591	AE2-156 O1	16.5376
941601	AE2-157 C	9.9006
942001	AE2-212 C	2.0301
942131	AE2-225 C	1.9561
942151	AE2-227 C	2.0914

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942161	AE2-228 C	2.0482
942171	AE2-229 C	1.9561
942191	AE2-231 C O1	6.5490
942341	AE2-247 C	0.7272
942371	AE2-250 C O1	9.1272
942401	AE2-253 C	5.6506
942551	AE2-270	25.3967
942851	AE2-304 C	0.5699
942931	AE2-313 C	29.4994
943431	AF1-014 C	0.6389
943451	AF1-016 C O1	0.6633
943461	AF1-017 C	0.6580
943471	AF1-018	3.5656
943611	AF1-032 C	0.8466
943621	AF1-033 C	1.1737
943741	AF1-042 C	0.6906
944011	AF1-069 C	5.6514
944061	AF1-074 C O1	3.5752
944501	AF1-115 C O1	3.5746
944581	AF1-123 C O1	21.3393
944591	AF1-124 C O1	21.3393
944601	AF1-125 C O1	21.3393
944631	AF1-128 O1	28.1937
944641	AF1-129 O1	52.2717
944871	AF1-152 C	2.5407
945361	AF1-201 C O1	8.0044
946001	AF1-265	32.0865
946011	AF1-266	6.1744
946261	AF1-291 C	1.0857
LGEE	LGEE	1.2853
CPL	CPL	7.5074
WEC	WEC	0.6357
CBM-W2	CBM-W2	28.6077
NY	NY	2.5692
CBM-W1	CBM-W1	22.4179
TVA	TVA	6.3266
CBM-S2	CBM-S2	52.2685
CBM-S1	CBM-S1	34.9150
MADISON	MADISON	1.8809
MEC	MEC	4.0869

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>AA2-074</b>	AA2-074	5.1156

## 12.6.6 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
42883328	314911	8LADYSMITH	DVP	314922	8POSSUM	DVP	1	DVP_P1-2: LN 594	single	2442.12	130.19	130.85	DC	52.35

Bus #	Bus	MW Impact
314229	6MT RD221	0.0980
314236	6NRTHEST	0.1497
314241	6OLDCHRC	0.6040
314250	6ROCKVILLE	0.2677
314309	6IRON208	0.3569
315043	1FOUR RIVERA	2.3650
315044	1FOUR RIVERB	2.3650
315045	1FOUR RIVERC	2.9013
315046	1FOUR RIVERD	2.3650
315047	1FOUR RIVERE	2.3650
315048	1FOUR RIVERF	2.9013
315058	1CHESTF3 (Deactivation : 12/13/18)	14.4610
315059	1CHESTF4 (Deactivation : 12/13/18)	23.4414
315060	1CHESTF5	8.0197
315067	1DARBY 1	2.0608
315068	1DARBY 2	2.0632
315069	1DARBY 3	2.0705
315070	1DARBY 4	2.0729
315074	1HOPCGN1 (Deactivation : 06/25/19)	6.6486
315075	1HOPCGN2 (Deactivation : 06/25/19)	6.5625
315083	1SPRUNCA (Deactivation : 01/12/19)	9.9482
315084	1SPRUNCB (Deactivation : 01/12/19)	9.9482
315090	1YORKTN1 (Deactivation : 09/09/18)	22.5417
315091	1YORKTN2 (Deactivation : 09/09/18)	23.3923
315225	1N ANNA1	28.3828
315226	1N ANNA2	28.3947
315610	6AA1-145GAS	8.2895
923831	AB2-022 C	1.7836
924061	AB2-050	0.4876
924241	AB2-068 OP	189.1040
925051	AB2-160 C O1	4.3241
925061	AB2-161 C O1	2.6420
925331	AB2-190 C	15.9565

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925861	AC1-065 C	2.6082
926291	AC1-107 O1	285.4400
926551	AC1-134	1.2190
926661	AC1-147 C	1.7645
926731	AC1-158 C	73.4024
926751	AC1-161 C O1	23.8059
926781	AC1-164 C	37.7700
927041	AC1-191 C O1	7.5420
927221	AC1-216 C O1	7.8012
932041	AC2-012 C	7.9821
932501	AC2-070 C	1.5987
932581	AC2-078 C O1	3.2018
932591	AC2-079 C O1	4.4713
932831	AC2-110 C	1.0433
933011	AC2-125	2.1405
933021	AC2-126	2.1549
933261	AC2-137 C	1.9572
933291	AC2-141 C	23.8059
933731	AC2-196 C	1.3956
934011	AD1-025 C	13.4101
934061	AD1-033 C	5.8627
934141	AD1-041 C	4.0887
934571	AD1-082 C	6.0209
935111	AD1-144 C	1.3486
935161	AD1-151 C O1	12.8222
935211	AD1-156 C	1.6720
936041	AD2-007 C	0.6406
936051	AD2-008 C	2.3347
936151	AD2-021	0.2232
936301	AD2-039 C	1.0433
936661	AD2-085 C	2.6833
936761	AD2-097 C	1.8867
937221	AD2-160 C O1	4.5561
937251	AD2-164	3.7758
937541	AD2-215 C	1.3625
938031	AE1-004 C	1.0433
938181	AE1-027 C	1.8252
938191	AE1-028 C	1.0589
938491	AE1-068 C O1	42.8446
938501	AE1-069 C O1	2.8138

Bus #	Bus	MW Impact
938531	AE1-072 C O1	13.6434
938551	AE1-074 C	2.2884
938631	AE1-085 C O1	7.0116
939191	AE1-149 C O1	8.4410
939261	AE1-157 C O1	13.2766
939271	AE1-158 C O1	13.5496
939311	AE1-162 C	1.6905
939411	AE1-173 C	66.8549
939421	AE1-174 C	0.2865
939431	AE1-175 C	1.9051
939611	AE1-191 C	8.1773
939751	AE1-206 C O1	29.9524
940061	AE2-000BC O1	12.5146
940071	AE1-249 C (Withdrawn : 01/10/2020)	5.7038
940231	AE2-005 C	1.0433
940251	AE2-007 O1	135.5250
940431	AE2-027 C O1	10.3079
940471	AE2-031 C	23.3431
940481	AE2-033 C	11.8793
940541	AE2-040 O1	1.2562
940551	AE2-041 O1	5.5264
940641	AE2-051 C O1	12.5276
940651	AE2-052	1.4912
940891	AE2-078 C	1.8667
940901	AE2-079 C	1.8667
940911	AE2-080 C	1.8667
941031	AE2-094 C	27.9273
941101	AE2-104 C O1	2.7110
941281	AE2-122 C O1	11.7685
941291	AE2-123 C O1	12.0944
941301	AE2-124 C O1	10.9956
941501	AE2-147 C	12.2339
941581	AE2-155 C	0.6082
941591	AE2-156 O1	14.0063
941601	AE2-157 C	8.3762
942001	AE2-212 C	1.7096
942131	AE2-225 C	1.6595
942151	AE2-227 C	2.0591
942161	AE2-228 C	1.7219
942171	AE2-229 C	1.6595

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942191	AE2-231 C O1	5.1480
942341	AE2-247 C	0.6165
942371	AE2-250 C O1	7.6809
942401	AE2-253 C	4.7923
942551	AE2-270	21.3703
942851	AE2-304 C	0.4853
942931	AE2-313 C	25.2749
943431	AF1-014 C	0.5238
943451	AF1-016 C O1	0.5631
943461	AF1-017 C	0.5578
943471	AF1-018	2.9290
943611	AF1-032 C	0.7183
943621	AF1-033 C	0.9893
944011	AF1-069 C	4.8362
944061	AF1-074 C O1	3.0236
944501	AF1-115 C O1	3.0130
944581	AF1-123 C O1	18.0802
944591	AF1-124 C O1	18.0802
944601	AF1-125 C O1	18.0802
944631	AF1-128 O1	23.5855
944641	AF1-129 O1	43.7281
944871	AF1-152 C	2.1613
945361	AF1-201 C O1	6.6615
946001	AF1-265	26.2740
946011	AF1-266	5.2703
946261	AF1-291 C	0.9127
LGEE	LGEE	1.8878
CPL	CPL	6.8961
WEC	WEC	0.9759
CBM-W2	CBM-W2	35.1105
NY	NY	2.7130
CBM-W1	CBM-W1	36.2039
TVA	TVA	7.1638
CBM-S2	CBM-S2	50.0317
CBM-S1	CBM-S1	40.7341
MADISON	MADISON	1.4818
MEC	MEC	5.6330
AA2-074	AA2-074	4.7061

## 12.6.7 Index 6

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
42883263	314914	8MDLTHAN	DVP	314918	8NO ANNA	DVP	1	DVP_P1-2: LN 574	single	2442.12	150.45	150.66	DC	73.9

Bus #	Bus	MW Impact
314295	6BIRDNECK	0.0584
314491	3PENDLTN	0.4363
314507	3THOMPSN	0.4390
314947	8GREENSVILLE	70.1242
315058	1CHESTF3 (Deativation : 12/13/18)	20.5130
315059	1CHESTF4 (Deativation : 12/13/18)	33.2517
315074	1HOPCGN1 (Deativation : 06/25/19)	9.9214
315075	1HOPCGN2 (Deativation : 06/25/19)	9.7928
315083	1SPRUNCA (Deativation : 01/12/19)	13.1478
315084	1SPRUNCB (Deativation : 01/12/19)	13.1478
315090	1YORKTN1 (Deativation : 09/09/18)	34.8809
315091	1YORKTN2 (Deativation : 09/09/18)	36.1971
315098	1CHESPKA	0.5801
315099	1CHESPKB (Deativation : 05/31/19)	4.4206
315102	1BRUNSWICKG1	11.5172
315103	1BRUNSWICKG2	11.5172
315104	1BRUNSWICKG3	11.5172
315105	1BRUNSWICKS1	23.9269
315108	1ELIZAR1	4.2653
315109	1ELIZAR2	4.1912
315110	1ELIZAR3	4.3199
315131	1EDGECEMA (Deativation : 04/22/19)	11.1364
315132	1EDGECEMB (Deativation : 04/22/19)	11.1364
315260	1GOSPORTA	0.4632
315261	1GOSPORTB	0.5917
315262	1GOSPORTC	0.5022
315294	1DOMTR10	13.9077
315603	6AA1-139SOLA	3.2559
923262	AB1-132 C OP	17.8043
923263	AB1-132 E OP	7.6304
923572	AB1-173 C OP	2.8651
923582	AB1-173AC OP	2.8651
923801	AB2-015 C OP	11.1749
923831	AB2-022 C	3.0388

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
923911	AB2-031 C O1	2.8439
923991	AB2-040 C O1	9.3380
924151	AB2-059 C OP	11.3377
924501	AB2-099 C	0.7489
924511	AB2-100 C	14.8913
925051	AB2-160 C O1	6.7303
925061	AB2-161 C O1	4.3797
925121	AB2-169 C	8.1887
925171	AB2-174 C O1	8.9475
925331	AB2-190 C	24.6359
925591	AC1-034 C	8.2036
925781	AC1-054 C O1	8.6290
926071	AC1-086 C	26.2190
926201	AC1-098 C	7.6634
926211	AC1-099 C	2.5680
926661	AC1-147 C	3.5146
926751	AC1-161 C O1	47.7284
926781	AC1-164 C	42.8999
927021	AC1-189 C	10.5359
927141	AC1-208 C	11.1971
927221	AC1-216 C O1	12.0856
932041	AC2-012 C	15.8996
932581	AC2-078 C O1	5.2024
932591	AC2-079 C O1	7.4798
932631	AC2-084 C	10.9244
933261	AC2-137 C	2.2246
933291	AC2-141 C	47.7284
933501	AC2-165 C	12.0190
933731	AC2-196 C	2.7940
933991	AD1-023 C	16.9247
934011	AD1-025 C	20.7750
934061	AD1-033 C	11.7331
934201	AD1-047 C	10.1869
934331	AD1-057 C O1	12.3025
934521	AD1-076 C	70.1959
934571	AD1-082 C	9.9811
934611	AD1-087 C O1	10.0737
935111	AD1-144 C	2.2527
935161	AD1-151 C O1	19.7967
935171	AD1-152 C O1	10.0111

Bus #	Bus	MW Impact
935211	AD1-156 C	2.7434
936041	AD2-007 C	0.9924
936051	AD2-008 C	3.6169
936151	AD2-021	0.2537
936401	AD2-051 C O1	11.2517
936661	AD2-085 C	4.4869
936701	AD2-089 C (Withdrawn : 12/09/2019)	8.7730
936711	AD2-090 C O1	9.2699
936761	AD2-097 C	2.4936
937221	AD2-160 C O1	9.1243
937251	AD2-164	5.8975
937481	AD2-202 C O1	2.6696
937541	AD2-215 C	2.2759
937571	AD2-169 C	12.6812
938171	AE1-026 C O1	41.2480
938181	AE1-027 C	3.6544
938191	AE1-028 C	2.1201
938221	AE1-035 C	2.8784
938491	AE1-068 C O1	100.1892
938501	AE1-069 C O1	78.4394
938531	AE1-072 C O1	27.3299
938551	AE1-074 C	3.8759
938561	AE1-075 C	2.7287
938631	AE1-085 C O1	11.4253
938661	AE1-088	4.1993
938771	AE1-103 C O1	4.7195
939191	AE1-149 C O1	13.6649
939311	AE1-162 C	2.7609
939411	AE1-173 C	148.7136
939421	AE1-174 C	0.4212
939431	AE1-175 C	2.8008
940061	AE2-000BC O1	20.7460
940071	AE1-249 C (Withdrawn : 01/10/2020)	8.8778
940251	AE2-007 O1	270.2313
940431	AE2-027 C O1	15.4805
940471	AE2-031 C	54.6395
940481	AE2-033 C	20.7349
940491	AE2-034 C	5.7765
940521	AE2-037 C	10.2716
940541	AE2-040 O1	2.1934

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940571	AE2-044 C	2.8477
940641	AE2-051 C O1	28.7901
940651	AE2-052	2.4141
940891	AE2-078 C	2.9668
940901	AE2-079 C	2.9668
940911	AE2-080 C	2.9668
941031	AE2-094 C	65.5498
941101	AE2-104 C O1	4.5891
941281	AE2-122 C O1	44.3569
941291	AE2-123 C O1	45.5852
941301	AE2-124 C O1	41.4567
941501	AE2-147 C	20.8501
941541	AE2-151 C	1.3864
941591	AE2-156 O1	27.9100
941601	AE2-157 C	13.7751
942001	AE2-212 C	2.6685
942131	AE2-225 C	2.8190
942151	AE2-227 C	2.4775
942161	AE2-228 C	2.6082
942171	AE2-229 C	2.8190
942341	AE2-247 C	1.0306
942371	AE2-250 C O1	11.9551
942401	AE2-253 C	9.5972
942471	AE2-260 C O1	18.4876
942551	AE2-270	32.9945
942851	AE2-304 C	0.8282
942931	AE2-313 C	59.1614
943171	AE2-346 C	0.9526
943451	AF1-016 C O1	0.9531
943461	AF1-017 C	0.9325
943611	AF1-032 C	1.2201
943621	AF1-033 C	1.5724
943911	AF1-059	10.6093
944011	AF1-069 C	21.4176
944051	AF1-073 C O1	13.9210
944061	AF1-074 C O1	4.9563
944141	AF1-082	1.8307
944501	AF1-115 C O1	4.7887
944581	AF1-123 C O1	68.5550
944591	AF1-124 C O1	68.5550

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
944601	AF1-125 C O1	68.5550
944631	AF1-128 O1	33.2912
944641	AF1-129 O1	61.7228
944871	AF1-152 C	3.6835
945361	AF1-201 C O1	9.8585
945711	AF1-236 C O1	54.2044
945811	AF1-246 C O1	11.6432
946011	AF1-266	9.1991
946261	AF1-291 C	1.3819
946281	AF1-292 C	1.0149
946461	AF1-310 C O1 (Withdrawn : 11/05/2019)	13.4668
LGEE	LGEE	2.5741
CPL	CPL	12.1544
WEC	WEC	1.3312
CBM-W2	CBM-W2	52.1048
NY	NY	3.0255
CBM-W1	CBM-W1	49.0517
TVA	TVA	10.9606
CBM-S2	CBM-S2	85.2839
CBM-S1	CBM-S1	61.4462
MADISON	MADISON	2.7821
MEC	MEC	7.9863
AA2-074	AA2-074	8.2876

## 12.6.8 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
42883442	314916	8MORRSVL	DVP	314913	8LOUDOUN	DVP	1	DVP_P1-2: LN 580	single	2738.22	107.02	107.55	DC	38.86

Bus #	Bus	MW Impact
314078	3REMNGTN	0.2348
314250	6ROCKVILLE	0.2012
315021	1REMNGT1	4.7208
315022	1REMNGT2	4.7270
315023	1REMNGT3	4.7458
315024	1REMNGT4	4.7270
315028	1M RUN A	5.2437
315029	1M RUN B	5.2015
315030	1M RUN C	5.2437
315058	1CHESTF3 (Deativation : 12/13/18)	10.7755
315059	1CHESTF4 (Deativation : 12/13/18)	17.4670
315074	1HOPCGN1 (Deativation : 06/25/19)	4.9587
315075	1HOPCGN2 (Deativation : 06/25/19)	4.8945
315083	1SPRUNCA (Deativation : 01/12/19)	6.3814
315084	1SPRUNCB (Deativation : 01/12/19)	7.5075
315090	1YORKTN1 (Deativation : 09/09/18)	16.8451
315091	1YORKTN2 (Deativation : 09/09/18)	17.4808
315172	1LOISA A	1.8114
315173	1LOISA B	1.8208
315174	1LOISA C	1.8208
315175	1LOISA D	1.8208
315176	1LOISA E	3.7122
315177	1S ANNAG1	1.2511
315178	1S ANNAS1	0.6429
315179	1S ANNAG2	1.2511
315180	1S ANNAS2	0.6429
315225	1N ANNA1	25.2463
315226	1N ANNA2	25.2570
315270	1WARREN G1	11.9895
315271	1WARREN G2	11.9895
315272	1WARREN G3	11.9895
315273	1WARREN S1	22.4640
923831	AB2-022 C	1.3396

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
924241	AB2-068 OP	114.5712
925021	AB2-158 C	10.8013
925051	AB2-160 C O1	3.2427
925061	AB2-161 C O1	1.9850
925331	AB2-190 C	11.9248
925671	AC1-043 C	7.9386
925861	AC1-065 C	1.9831
926001	AC1-076 C	4.9633
926291	AC1-107 O1	172.9376
926481	AC1-120 C O1	8.1592
926501	AC1-121 C O1	2.8021
926611	AC1-143 C O1	9.0137
926661	AC1-147 C	1.3269
926731	AC1-158 C	83.7093
926751	AC1-161 C O1	17.9027
926781	AC1-164 C	23.6589
927041	AC1-191 C O1	5.6533
927221	AC1-216 C O1	5.8314
932041	AC2-012 C	6.0025
932501	AC2-070 C	0.9935
932581	AC2-078 C O1	2.4056
932591	AC2-079 C O1	3.3594
932781	AC2-102 C	6.2861
932831	AC2-110 C	0.7932
933011	AC2-125	1.6149
933021	AC2-126	1.6258
933151	AC2-133 1	0.1776
933161	AC2-133 2	0.1776
933171	AC2-133 3	0.1776
933181	AC2-133 4	0.3328
933261	AC2-137 C	1.2269
933291	AC2-141 C	17.9027
933731	AC2-196 C	1.0497
934011	AD1-025 C	10.0240
934061	AD1-033 C	4.4093
934141	AD1-041 C	3.1199
934571	AD1-082 C	4.5237
934861	AD1-115 C	3.9693
935111	AD1-144 C	1.0126
935161	AD1-151 C O1	9.5824

Bus #	Bus	MW Impact
935211	AD1-156 C	1.2594
936041	AD2-007 C	0.4789
936051	AD2-008 C	1.7451
936151	AD2-021	0.1399
936301	AD2-039 C	0.7932
936661	AD2-085 C	2.0160
936761	AD2-097 C	1.2103
937221	AD2-160 C O1	3.4256
937251	AD2-164	2.8235
937541	AD2-215 C	1.0230
938031	AE1-004 C	0.7932
938181	AE1-027 C	1.3726
938191	AE1-028 C	0.7963
938291	AE1-044 C O1	28.3972
938491	AE1-068 C O1	14.9070
938531	AE1-072 C O1	10.2542
938551	AE1-074 C	1.7544
938561	AE1-075 C	1.2531
938631	AE1-085 C O1	5.2679
939191	AE1-149 C O1	6.3419
939221	AE1-153 C O1	17.0352
939231	AE1-154 C	1.7707
939261	AE1-157 C O1	8.4402
939271	AE1-158 C O1	8.6137
939311	AE1-162 C	1.2681
939411	AE1-173 C	51.1469
939421	AE1-174 C	0.2129
939431	AE1-175 C	1.4161
939611	AE1-191 C	6.2399
939751	AE1-206 C O1	18.5975
940061	AE2-000BC O1	9.4026
940071	AE1-249 C (Withdrawn : 01/10/2020)	4.2773
940231	AE2-005 C	0.7932
940251	AE2-007 O1	101.9275
940431	AE2-027 C O1	7.7112
940471	AE2-031 C	17.9832
940551	AE2-041 O1	4.1851
940641	AE2-051 C O1	9.6382
940651	AE2-052	1.1204
940891	AE2-078 C	1.3975

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940901	AE2-079 C	1.3975
940911	AE2-080 C	1.3975
941031	AE2-094 C	21.5131
941101	AE2-104 C O1	2.0369
941281	AE2-122 C O1	8.8507
941291	AE2-123 C O1	9.0958
941301	AE2-124 C O1	8.2694
941361	AE2-132	3.9513
941381	AE2-134	3.4201
941581	AE2-155 C	0.3780
941591	AE2-156 O1	10.5332
941601	AE2-157 C	6.2929
941831	AE2-188	8.2712
941851	AE2-190 C	5.0044
942001	AE2-212 C	1.2817
942131	AE2-225 C	1.2474
942151	AE2-227 C	1.3017
942161	AE2-228 C	1.2871
942171	AE2-229 C	1.2474
942191	AE2-231 C O1	3.2564
942341	AE2-247 C	0.4632
942371	AE2-250 C O1	5.7600
942401	AE2-253 C	3.6032
942551	AE2-270	15.9706
942931	AE2-313 C	19.4714
943431	AF1-014 C	0.3983
943451	AF1-016 C O1	0.4230
943461	AF1-017 C	0.4191
943471	AF1-018	2.2181
943611	AF1-032 C	0.5399
943621	AF1-033 C	0.7406
944011	AF1-069 C	3.7254
944061	AF1-074 C O1	2.2716
944111	AF1-079 C	3.3643
944501	AF1-115 C O1	2.2556
944581	AF1-123 C O1	13.6068
944591	AF1-124 C O1	13.6068
944601	AF1-125 C O1	13.6068
944631	AF1-128 O1	17.5077
944641	AF1-129 O1	32.4596

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
945361	AF1-201 C O1	5.0174
946001	AF1-265	8.6462
946261	AF1-291 C	0.6822
946371	AF1-301 C	15.7859
LGEE	LGEE	0.5756
CPLE	CPLE	4.8534
WEC	WEC	0.2621
CBM-W2	CBM-W2	15.3890
NY	NY	2.1949
CBM-W1	CBM-W1	8.3442
TVA	TVA	3.6554
CBM-S2	CBM-S2	33.2870
CBM-S1	CBM-S1	19.7068
MADISON	MADISON	1.3245
MEC	MEC	1.9481
AA2-074	AA2-074	3.3048

## 12.6.9 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
42883420	314918	8NO ANNA	DVP	314934	8SPOTSYL	DVP	1	DVP_P1-2: LN 581	single	3218.56	115.36	115.41	DC	64.39

Bus #	Bus	MW Impact
314236	6NRTHEST	0.1824
314250	6ROCKVILLE	0.3351
314309	6IRON208	0.4399
314314	3LOCKS	0.2938
315058	1CHESTF3 (Deativation : 12/13/18)	17.8602
315059	1CHESTF4 (Deativation : 12/13/18)	28.9514
315065	1CHESTF6	19.9781
315067	1DARBY 1	2.5098
315068	1DARBY 2	2.5127
315069	1DARBY 3	2.5215
315070	1DARBY 4	2.5245
315074	1HOPCGN1 (Deativation : 06/25/19)	8.2748
315075	1HOPCGN2 (Deativation : 06/25/19)	8.1675
315083	1SPRUNCA (Deativation : 01/12/19)	12.5553
315084	1SPRUNCB (Deativation : 01/12/19)	12.5553
315090	1YORKTN1 (Deativation : 09/09/18)	28.2247
315091	1YORKTN2 (Deativation : 09/09/18)	29.2898
315108	1ELIZAR1	3.2126
315109	1ELIZAR2	3.1568
315110	1ELIZAR3	3.2537
315225	1N ANNA1	49.1912
315226	1N ANNA2	49.2119
315233	1SURRY 2	24.8852
923831	AB2-022 C	2.2754
924241	AB2-068 OP	187.7414
925051	AB2-160 C O1	6.3995
925061	AB2-161 C O1	3.3581
925331	AB2-190 C	19.9863
926291	AC1-107 O1	283.3832
926661	AC1-147 C	2.2520
926731	AC1-158 C	-133.4652
926751	AC1-161 C O1	35.7913
926781	AC1-164 C	38.9511

Bus #	Bus	MW Impact
927221	AC1-216 C O1	9.7776
932041	AC2-012 C	10.1876
932501	AC2-070 C	1.6271
932581	AC2-078 C O1	4.0586
932591	AC2-079 C O1	5.6900
933261	AC2-137 C	2.0212
933291	AC2-141 C	35.7913
933731	AC2-196 C	1.7828
934011	AD1-025 C	16.8075
934061	AD1-033 C	7.4888
934571	AD1-082 C	7.6529
935111	AD1-144 C	1.7150
935161	AD1-151 C O1	16.0604
935211	AD1-156 C	2.5029
936041	AD2-007 C	0.8029
936051	AD2-008 C	2.9261
936151	AD2-021	0.2305
936661	AD2-085 C	3.4147
936761	AD2-097 C	2.3812
937221	AD2-160 C O1	5.8183
937251	AD2-164	4.7369
937541	AD2-215 C	1.7327
938181	AE1-027 C	2.3312
938191	AE1-028 C	1.3525
938491	AE1-068 C O1	57.1526
938501	AE1-069 C O1	44.7728
938531	AE1-072 C O1	17.4166
938551	AE1-074 C	2.9559
938631	AE1-085 C O1	8.8910
939191	AE1-149 C O1	10.6942
939311	AE1-162 C	2.1413
939411	AE1-173 C	103.7328
939421	AE1-174 C	0.3546
939431	AE1-175 C	2.3578
939751	AE1-206 C O1	29.9392
940061	AE2-000BC O1	15.9066
940071	AE1-249 C (Withdrawn : 01/10/2020)	8.4415
940251	AE2-007 O1	203.5540
940431	AE2-027 C O1	15.1452
940471	AE2-031 C	36.6775

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940641	AE2-051 C O1	19.6398
940651	AE2-052	1.8893
940891	AE2-078 C	2.3508
940901	AE2-079 C	2.3508
940911	AE2-080 C	2.3508
941031	AE2-094 C	43.9471
941101	AE2-104 C O1	3.4558
941281	AE2-122 C O1	15.0277
941291	AE2-123 C O1	15.4438
941301	AE2-124 C O1	14.0415
941501	AE2-147 C	15.2353
941581	AE2-155 C	0.6190
941591	AE2-156 O1	21.0340
941601	AE2-157 C	10.6345
942001	AE2-212 C	2.5310
942131	AE2-225 C	2.1178
942151	AE2-227 C	2.5379
942161	AE2-228 C	2.5324
942171	AE2-229 C	2.1178
942341	AE2-247 C	0.7845
942371	AE2-250 C O1	11.3675
942401	AE2-253 C	6.1198
942551	AE2-270	26.7674
942931	AE2-313 C	39.7128
943451	AF1-016 C O1	0.7178
943461	AF1-017 C	0.7098
943611	AF1-032 C	0.9167
943621	AF1-033 C	1.2459
944011	AF1-069 C	14.3592
944061	AF1-074 C O1	3.8371
944501	AF1-115 C O1	3.7944
944581	AF1-123 C O1	51.3298
944591	AF1-124 C O1	51.3298
944601	AF1-125 C O1	51.3298
944631	AF1-128 O1	29.0094
944641	AF1-129 O1	53.7841
944871	AF1-152 C	2.7552
945361	AF1-201 C O1	8.3348
946001	AF1-265	13.9191
946261	AF1-291 C	2.5324

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>LGEE</b>	LGEE	1.3236
<b>CPL</b>	CPL	8.3495
<b>WEC</b>	WEC	0.6514
<b>CBM-W2</b>	CBM-W2	30.4422
<b>NY</b>	NY	2.7711
<b>CBM-W1</b>	CBM-W1	22.7932
<b>TVA</b>	TVA	6.8054
<b>CBM-S2</b>	CBM-S2	57.7538
<b>CBM-S1</b>	CBM-S1	37.3943
<b>MADISON</b>	MADISON	2.1188
<b>MEC</b>	MEC	4.2696
<b>AA2-074</b>	AA2-074	5.6884

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
42883458	314919	80X	DVP	314904	8CLIFTON	DVP	1	DVP_P1-2: LN 569	single	2442.12	103.79	103.85	DC	37.39

Bus #	Bus	MW Impact
<b>314131</b>	6ARNOLDS	0.1721
<b>314134</b>	6CRANES	0.0383
315005	1POSSM 3 (Deativation : 12/13/18)	12.7837
315006	1POSSM 4 (Deativation : 12/13/18)	24.5689
315007	1POSSM 5 (Deativation : 05/31/21)	87.0584
<b>315008</b>	1POSSM6A	2.9757
<b>315009</b>	1POSSM6B	2.9757
<b>315010</b>	1POSSM6S	4.6370
<b>315033</b>	1BIRCHWDA	4.5390
<b>315037</b>	1LDYSMT1	3.1029
<b>315038</b>	1LDYSMT2	3.1009
<b>315039</b>	1LDYSMT3	3.2816
<b>315040</b>	1LDYSMT4	3.2877
<b>315041</b>	1LDYSMT5	3.2980
<b>315043</b>	1FOUR RIVERA	1.7818
<b>315044</b>	1FOUR RIVERB	1.7818
<b>315045</b>	1FOUR RIVERC	2.1859
<b>315046</b>	1FOUR RIVERD	1.7818
<b>315047</b>	1FOUR RIVERE	1.7818
<b>315048</b>	1FOUR RIVERF	2.1859
315058	1CHESTF3 (Deativation : 12/13/18)	10.3649
315059	1CHESTF4 (Deativation : 12/13/18)	16.8015
315074	1HOPCGN1 (Deativation : 06/25/19)	4.7155
315075	1HOPCGN2 (Deativation : 06/25/19)	4.6544
315083	1SPRUNCA (Deativation : 01/12/19)	6.0018
315084	1SPRUNCB (Deativation : 01/12/19)	6.0018
315090	1YORKTN1 (Deativation : 09/09/18)	15.9734
315091	1YORKTN2 (Deativation : 09/09/18)	16.5761
<b>315225</b>	1N ANNA1	19.4117
<b>315226</b>	1N ANNA2	19.4199
<b>315610</b>	6AA1-145GAS	6.2455
<b>924061</b>	AB2-050	0.3674
<b>924241</b>	AB2-068 OP	111.6699
<b>925021</b>	AB2-158 C	6.1727

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925051	AB2-160 C O1	3.0579
925061	AB2-161 C O1	1.8458
925331	AB2-190 C	11.2698
925861	AC1-065 C	1.9795
926001	AC1-076 C	2.6236
926291	AC1-107 O1	168.5584
926481	AC1-120 C O1	3.8571
926501	AC1-121 C O1	1.3247
926551	AC1-134	0.9185
926661	AC1-147 C	1.2293
926731	AC1-158 C	50.4813
926751	AC1-161 C O1	16.5659
926781	AC1-164 C	23.0546
927041	AC1-191 C O1	5.7346
927221	AC1-216 C O1	5.5072
932041	AC2-012 C	5.5611
932501	AC2-070 C	0.9748
932581	AC2-078 C O1	2.2467
932591	AC2-079 C O1	3.1172
932781	AC2-102 C	2.9331
932831	AC2-110 C	0.7918
933011	AC2-125	2.1921
933021	AC2-126	2.2068
933261	AC2-137 C	1.1929
933271	AC2-138 C	0.5204
933291	AC2-141 C	16.5659
933731	AC2-196 C	0.9712
934011	AD1-025 C	9.4667
934061	AD1-033 C	4.0802
934141	AD1-041 C	3.1263
934191	AD1-046 C	4.0337
934571	AD1-082 C	4.2064
934781	AD1-105 C	4.9741
935111	AD1-144 C	0.9410
935161	AD1-151 C O1	9.0561
935211	AD1-156 C	1.1736
936041	AD2-007 C	0.4522
936051	AD2-008 C	1.6481
936151	AD2-021	0.1360
936301	AD2-039 C	0.7918

Bus #	Bus	MW Impact
936341	AD2-044 C	0.1626
936581	AD2-073 C	1.4600
936591	AD2-074 C	3.4909
936661	AD2-085 C	1.8710
936761	AD2-097 C	1.1383
937221	AD2-160 C O1	3.1683
937251	AD2-164	2.6712
937541	AD2-215 C	0.9507
938031	AE1-004 C	0.7918
938181	AE1-027 C	1.2698
938191	AE1-028 C	0.7367
938531	AE1-072 C O1	2.3785
938551	AE1-074 C	1.3760
938631	AE1-085 C O1	4.9172
938961	AE1-124 C	1.7475
939191	AE1-149 C O1	5.9277
939231	AE1-154 C	1.0119
939241	AE1-155 C	9.5816
939261	AE1-157 C O1	11.0958
939271	AE1-158 C O1	11.3240
939281	AE1-159 C O1 (Withdrawn : 12/20/2019)	10.0237
939311	AE1-162 C	1.1847
939411	AE1-173 C	46.2550
939421	AE1-174 C	0.2040
939431	AE1-175 C	1.3564
939611	AE1-191 C	6.2526
939751	AE1-206 C O1	18.9333
940061	AE2-000BC O1	8.7432
940071	AE1-249 C (Withdrawn : 01/10/2020)	4.0336
940231	AE2-005 C	0.7918
940251	AE2-007 O1	94.4102
940431	AE2-027 C O1	7.3287
940551	AE2-041 O1	4.1681
940651	AE2-052	1.0472
940891	AE2-078 C	1.3141
940901	AE2-079 C	1.3141
940911	AE2-080 C	1.3141
941141	AE2-108 C	0.4874
941151	AE2-109 C	0.1706
941281	AE2-122 C O1	8.1936

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
941291	AE2-123 C O1	8.4204
941301	AE2-124 C O1	7.6553
941381	AE2-134	1.8079
941581	AE2-155 C	0.3709
941591	AE2-156 O1	9.7580
941601	AE2-157 C	5.8619
941831	AE2-188	3.8593
942001	AE2-212 C	1.2066
942131	AE2-225 C	1.1541
942151	AE2-227 C	1.2495
942161	AE2-228 C	1.2187
942171	AE2-229 C	1.1541
942191	AE2-231 C O1	4.2003
942341	AE2-247 C	0.4298
942371	AE2-250 C O1	5.4318
942401	AE2-253 C	3.3325
942551	AE2-270	15.0935
943431	AF1-014 C	0.3976
943461	AF1-017 C	0.3889
943471	AF1-018	2.2091
943601	AF1-031 C	4.1433
943611	AF1-032 C	0.4995
943621	AF1-033 C	0.6965
943741	AF1-042 C	0.9681
943991	AF1-067 C	1.7409
944061	AF1-074 C O1	2.1176
944111	AF1-079 C	1.0190
944491	AF1-114 C	5.5541
944501	AF1-115 C O1	2.1211
944581	AF1-123 C O1	12.5822
944591	AF1-124 C O1	12.5822
944601	AF1-125 C O1	12.5822
944631	AF1-128 O1	16.8454
944641	AF1-129 O1	31.2318
945361	AF1-201 C O1	4.8532
945831	AF1-248	0.1207
946001	AF1-265	8.8023
946261	AF1-291 C	0.6460
946371	AF1-301 C	4.7977
LGEE	LGEE	0.3994

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>CPLE</b>	CPLE	4.3044
<b>WEC</b>	WEC	0.1685
<b>CBM-W2</b>	CBM-W2	12.2850
<b>NY</b>	NY	1.9571
<b>CBM-W1</b>	CBM-W1	4.7788
<b>TVA</b>	TVA	3.0436
<b>CBM-S2</b>	CBM-S2	29.2526
<b>CBM-S1</b>	CBM-S1	16.1880
<b>MADISON</b>	MADISON	1.2156
<b>MEC</b>	MEC	1.4269
<b>AA2-074</b>	AA2-074	2.9299

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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
42883354	314934	8SPOTSYL	DVP	314916	8MORRSVL	DVP	1	DVP_P1-2: LN 552	single	3218.56	120.09	120.13	DC	63.61

Bus #	Bus	MW Impact
314236	6NRTHEST	0.1802
314250	6ROCKVILLE	0.3313
314309	6IRON208	0.4346
314314	3LOCKS	0.2902
315058	1CHESTF3 (Deactivation : 12/13/18)	17.6443
315059	1CHESTF4 (Deactivation : 12/13/18)	28.6014
315065	1CHESTF6	19.7367
315067	1DARBY 1	2.4797
315068	1DARBY 2	2.4826
315069	1DARBY 3	2.4913
315070	1DARBY 4	2.4942
315074	1HOPCGN1 (Deactivation : 06/25/19)	8.1744
315075	1HOPCGN2 (Deactivation : 06/25/19)	8.0685
315077	1HOPHCF1	2.4064
315078	1HOPHCF2	2.4064
315079	1HOPHCF3	2.4064
315080	1HOPHCF4	3.6531
315083	1SPRUNCA (Deactivation : 01/12/19)	12.4079
315084	1SPRUNCB (Deactivation : 01/12/19)	12.4079
315090	1YORKTN1 (Deactivation : 09/09/18)	27.8733
315091	1YORKTN2 (Deactivation : 09/09/18)	28.9252
315108	1ELIZAR1	3.1724
315109	1ELIZAR2	3.1173
315110	1ELIZAR3	3.2130
315225	1N ANNA1	48.1559
315226	1N ANNA2	48.1762
315233	1SURRY 2	24.5743
923831	AB2-022 C	2.2475
924241	AB2-068 OP	185.4979
925021	AB2-158 C	12.8204
925051	AB2-160 C O1	6.3214
925061	AB2-161 C O1	3.3169
925331	AB2-190 C	19.7416

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
926001	AC1-076 C	6.1102
926291	AC1-107 O1	279.9968
926661	AC1-147 C	2.2238
926731	AC1-158 C	184.7658
926751	AC1-161 C O1	35.3388
926781	AC1-164 C	38.4782
927221	AC1-216 C O1	9.6579
932041	AC2-012 C	10.0602
932501	AC2-070 C	1.6074
932581	AC2-078 C O1	4.0088
932591	AC2-079 C O1	5.6206
933261	AC2-137 C	1.9967
933291	AC2-141 C	35.3388
933731	AC2-196 C	1.7605
934011	AD1-025 C	16.6017
934061	AD1-033 C	7.3953
934571	AD1-082 C	7.5590
935111	AD1-144 C	1.6939
935161	AD1-151 C O1	15.8638
935211	AD1-156 C	2.4722
936041	AD2-007 C	0.7931
936051	AD2-008 C	2.8903
936151	AD2-021	0.2277
936661	AD2-085 C	3.3728
936761	AD2-097 C	2.3532
937221	AD2-160 C O1	5.7458
937251	AD2-164	4.6781
937541	AD2-215 C	1.7113
938181	AE1-027 C	2.3022
938191	AE1-028 C	1.3356
938491	AE1-068 C O1	56.4380
938501	AE1-069 C O1	44.2190
938531	AE1-072 C O1	17.2012
938551	AE1-074 C	2.9223
938631	AE1-085 C O1	8.7822
939191	AE1-149 C O1	10.5631
939231	AE1-154 C	2.1017
939311	AE1-162 C	2.1148
939411	AE1-173 C	102.3888
939421	AE1-174 C	0.3502

Bus #	Bus	MW Impact
939431	AE1-175 C	2.3287
940061	AE2-000BC O1	15.7116
940071	AE1-249 C (Withdrawn : 01/10/2020)	8.3384
940251	AE2-007 O1	201.0092
940431	AE2-027 C O1	14.9616
940471	AE2-031 C	36.2216
940641	AE2-051 C O1	19.3833
940651	AE2-052	1.8662
940891	AE2-078 C	2.3218
940901	AE2-079 C	2.3218
940911	AE2-080 C	2.3218
941031	AE2-094 C	43.3877
941101	AE2-104 C O1	3.4135
941281	AE2-122 C O1	14.8402
941291	AE2-123 C O1	15.2511
941301	AE2-124 C O1	13.8662
941381	AE2-134	4.2104
941581	AE2-155 C	0.6115
941591	AE2-156 O1	17.6553
941601	AE2-157 C	10.5045
942001	AE2-212 C	2.5002
942131	AE2-225 C	2.0916
942151	AE2-227 C	2.5075
942161	AE2-228 C	2.5016
942171	AE2-229 C	2.0916
942341	AE2-247 C	0.7749
942371	AE2-250 C O1	11.2288
942401	AE2-253 C	6.0436
942551	AE2-270	26.4397
942931	AE2-313 C	39.2192
943451	AF1-016 C O1	0.7090
943461	AF1-017 C	0.7011
943611	AF1-032 C	0.9053
943621	AF1-033 C	1.2305
944011	AF1-069 C	14.1764
944061	AF1-074 C O1	3.7900
944111	AF1-079 C	3.9932
944501	AF1-115 C O1	3.7475
944581	AF1-123 C O1	50.6870
944591	AF1-124 C O1	50.6870

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
944601	AF1-125 C O1	50.6870
944631	AF1-128 O1	28.6582
944641	AF1-129 O1	53.1330
946001	AF1-265	2.3582
946261	AF1-291 C	2.5016
946371	AF1-301 C	19.0060
LGEE	LGEE	1.3327
CPL	CPL	8.2859
WEC	WEC	0.6558
CBM-W2	CBM-W2	30.4750
NY	NY	2.7805
CBM-W1	CBM-W1	22.9684
TVA	TVA	6.8026
CBM-S2	CBM-S2	57.4185
CBM-S1	CBM-S1	37.4028
MADISON	MADISON	2.0987
MEC	MEC	4.2871
AA2-074	AA2-074	5.6453

# Short Circuit

## 12.7 Short Circuit

The following Breakers are overdutied:

Bus Number	Bus Name	Breaker	Type	Capacity (Amps)	Duty Percentage Post Queue	Duty Percentage Pre Queue	Cost	Schedule (weeks)
314286	CHESTERF 5&6 230.kV	H912	S	40000	115.34%	100.76%	\$458,693	28
314286	CHESTERF 5&6 230.kV	G8TH9	S	40000	112.23%	97.16%	\$458,693	28
314214	CHICKAHOMINY 230.kV	L122	S	50000	100.13%	98.02%	\$466,828	28
<b>Total Cost</b>							<b>\$1,384,214</b>	

### **13 Network Impacts – Secondary Point of Interconnection**

The Queue Project AF1-128 was evaluated as a 306.9 MW (Capacity 306.9 MW) injection at the Chesterfield 115 kV substation in the Dominion area. The AF1-128 project has claimed 242.1 MW of Capacity Interconnection Rights from the deactivated Chesterfield units 3 and 4. The installed facilities will have a total capability of 569 MW with 569 MW of this output being recognized by PJM as Capacity. Project AF1-128 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-128 was studied with a commercial probability of 53%. Potential network impacts were as follows:

# Summer Peak Load Flow

### 13.1 Generation Deliverability

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

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
53339343	314284	3CHESTFLD	115.0	DVP	314300	3KEVLAR	115.0	DVP	1	DVP_P1-2: LN 72	single	165.44	65.85	100.91	DC	58.0

### 13.2 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
53338739	314279	3BBOVERI	115.0	DVP	314277	3BELLW72	115.0	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	72.6	108.86	DC	73.25
53338688	314284	3CHESTFLD	115.0	DVP	314234	3NRTHST	115.0	DVP	1	DVP_P4-5: L92-3	breaker	165.0	66.5	120.23	DC	88.65
53338714	314284	3CHESTFLD	115.0	DVP	314336	3REYMT72	115.0	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	75.12	111.39	DC	73.25
53338779	314284	3CHESTFLD	115.0	DVP	314300	3KEVLAR	115.0	DVP	1	DVP_P4-5: L92-4	breaker	202.0	58.63	100.29	DC	84.16
53339590	314284	3CHESTFLD	115.0	DVP	314234	3NRTHST	115.0	DVP	1	DVP_P7-1: LN 53-72	tower	165.0	63.85	100.56	DC	60.57
53338737	314313	3KNGSLAND	115.0	DVP	314279	3BBOVERI	115.0	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	72.89	109.16	DC	73.25
53338777	314323	3NC GAS	115.0	DVP	314327	3PLAZA	115.0	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	64.53	100.79	DC	73.25
53338730	314336	3REYMT72	115.0	DVP	314313	3KNGSLAND	115.0	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	73.54	109.8	DC	73.25
53338692	940430	AE2-027 TAP	115.0	DVP	314314	3LOCKS	115.0	DVP	1	DVP_P4-6: CHESTER T132	breaker	169.0	68.82	117.43	DC	82.16
53338693	940430	AE2-027 TAP	115.0	DVP	314314	3LOCKS	115.0	DVP	1	DVP_P4-5: L92-3	breaker	169.0	45.87	100.02	DC	91.53

### 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
42883148	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P4-2: H1T594	breaker	3351.0	105.88	105.9	DC	61.45

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 LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
42883149	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P4-2: 573T594	breaker	3351.0	105.31	105.32	DC	61.33
42883298	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1-2: LN 594	single	2442.12	141.39	141.5	DC	61.35
42883300	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1-2: LN 573	single	2442.12	136.19	136.77	DC	60.28
42883403	314908	8ELMONT	500.0	DVP	314911	8LADYSMIT H	500.0	DVP	1	DVP_P1-2: LN 576	single	4070.2	115.35	115.9	DC	102.08
42883406	314908	8ELMONT	500.0	DVP	314911	8LADYSMIT H	500.0	DVP	1	DVP_P1-2: LN 534	single	4070.2	100.01	101.19	DC	105.14
42883133	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P4-2: SPOTS H1T594	breaker	3351.0	110.37	110.39	DC	62.19
42883134	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P4-2: H1T594	breaker	3351.0	105.99	106.01	DC	60.48
42883168	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P4-2: 545T552	breaker	3637.0	101.81	101.83	DC	56.6
42883327	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1-2: LN 573	single	2442.12	130.19	130.74	DC	52.32
42883328	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1-2: LN 594	single	2442.12	129.88	130.44	DC	52.21
42883340	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1-2: LN 573	single	2738.22	127.62	127.72	DC	62.46
42883341	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1-2: LN 594	single	2738.22	126.5	126.61	DC	60.39
42883263	314914	8MDLTHAN	500.0	DVP	314918	8NO ANNA	500.0	DVP	1	DVP_P1-2: LN 574	single	2442.12	150.55	150.78	DC	74.06
42883269	314914	8MDLTHAN	500.0	DVP	314918	8NO ANNA	500.0	DVP	1	DVP_P1-2: LN 570	single	2442.12	111.47	112.13	DC	51.78
42883442	314916	8MORRSVL	500.0	DVP	314913	8LOUDOUN	500.0	DVP	1	DVP_P1-2: LN 580	single	2738.22	106.74	107.19	DC	38.91
42883420	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 581	single	3218.56	115.16	115.21	DC	64.49
42883423	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 552	single	3218.56	112.28	112.32	DC	63.2
42883458	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P1-2: LN 569	single	2442.12	103.75	103.8	DC	37.42
42883354	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 552	single	3218.56	119.93	119.96	DC	63.71
42883355	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 581	single	3218.56	119.0	119.04	DC	62.71

### 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/D C	MW IMPACT
53339342	314284	3CHESTFLD	115.0	DVP	314300	3KEVLAR	115.0	DVP	1	DVP_P1 -2: LN 72	operation	165.44	71.5	106.56	DC	58.0
53339364	314284	3CHESTFLD	115.0	DVP	314234	3NRTHST	115.0	DVP	1	DVP_P1 -2: LN 53	operation	134.42	62.7	100.68	DC	51.05
42883297	314905	8CHANCE	500.0	DVP	314900	8BRISTER	500.0	DVP	1	DVP_P1 -2: LN 594	operation	2442.12	144.46	144.48	DC	61.35
42883402	314908	8ELMONT	500.0	DVP	314911	8LADYSMIT H	500.0	DVP	1	DVP_P1 -2: LN 576	operation	4070.2	119.81	119.85	DC	102.08
42883321	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	DVP_P1 -2: LN 581	operation	2442.12	137.82	137.85	DC	54.51
42883331	314911	8LADYSMIT H	500.0	DVP	314922	8POSSUM	500.0	DVP	1	Base Case	operation	2442.12	108.11	108.13	DC	41.62
42883338	314911	8LADYSMIT H	500.0	DVP	314905	8CHANCE	500.0	DVP	1	DVP_P1 -2: LN 594	operation	2738.22	129.09	129.12	DC	60.39
42883441	314916	8MORRSVL	500.0	DVP	314913	8LOUDOUN	500.0	DVP	1	DVP_P1 -2: LN 580	operation	2738.22	110.82	110.84	DC	38.91
42883457	314919	8OX	500.0	DVP	314904	8CLIFTON	500.0	DVP	1	DVP_P1 -2: LN 569	operation	2442.12	108.07	108.29	DC	37.42

### 13.5 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

#### 13.5.1 Contingency Descriptions

Contingency Name	Contingency Definition
<b>DVP_P7-1: LN 53-72</b>	CONTINGENCY 'DVP_P7-1: LN 53-72' /* . OPEN BRANCH FROM BUS 314284 TO BUS 314300 CKT 1 /* 3CHESTFLD 115.00 - 3KEVLAR 115.00 OPEN BRANCH FROM BUS 314277 TO BUS 314279 CKT 1 /* 3BELLW72 115.00 - 3BBOVERI 115.00 OPEN BRANCH FROM BUS 314277 TO BUS 314323 CKT 1 /* 3BELLW72 115.00 - 3NC GAS 115.00 OPEN BRANCH FROM BUS 314279 TO BUS 314313 CKT 1 /* 3BBOVERI 115.00 - 3KNGSLAND 115.00 OPEN BRANCH FROM BUS 314284 TO BUS 314336 CKT 1 /* 3CHESTFLD 115.00 - 3REYMT72 115.00 OPEN BRANCH FROM BUS 314313 TO BUS 314336 CKT 1 /* 3KNGSLAND 115.00 - 3REYMT72 115.00 OPEN BRANCH FROM BUS 314323 TO BUS 314327 CKT 1 /* 3NC GAS 115.00 - 3PLAZA 115.00 OPEN BUS 314277 /* ISLAND: 3BELLW72 115.00 OPEN BUS 314279 /* ISLAND: 3BBOVERI 115.00 OPEN BUS 314313 /* ISLAND: 3KNGSLAND 115.00 OPEN BUS 314323 /* ISLAND: 3NC GAS 115.00 OPEN BUS 314336 /* ISLAND: 3REYMT72 115.00 END
<b>DVP_P1-2: LN 552</b>	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
<b>DVP_P4-5: L92-4</b>	CONTINGENCY 'DVP_P4-5: L92-4' /* CHESTERFIELD 115 115 KV OPEN BRANCH FROM BUS 314284 TO BUS 314336 CKT 1 /* 3CHESTFLD 115.00 - 3REYMT72 115.00 OPEN BRANCH FROM BUS 314284 TO BUS 314286 CKT 1 /* 3CHESTFLD 115.00 - 6CHESTF A 230.00 END
<b>DVP_P1-2: LN 594</b>	CONTINGENCY 'DVP_P1-2: LN 594' OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
<b>DVP_P4-6: CHESTER T132</b>	CONTINGENCY 'DVP_P4-6: CHESTER T132' /* CHESTERFIELD 115 115 KV OPEN BRANCH FROM BUS 314234 TO BUS 314284 CKT 1 /* 3NRTHEST 115.00 - 3CHESTFLD 115.00 OPEN BRANCH FROM BUS 314284 TO BUS 314300 CKT 1 /* 3CHESTFLD 115.00 - 3KEVLAR 115.00 OPEN BRANCH FROM BUS 314283 TO BUS 314284 CKT 1 /* 3CENTLIA 115.00 - 3CHESTFLD 115.00 OPEN BRANCH FROM BUS 314252 TO BUS 314284 CKT 1 /* 3TURNER92 115.00 - 3CHESTFLD 115.00 END
<b>DVP_P4-5: L92-3</b>	CONTINGENCY 'DVP_P4-5: L92-3' /* CHESTERFIELD 115 115 KV OPEN BRANCH FROM BUS 314284 TO BUS 314300 CKT 1 /* 3CHESTFLD 115.00 - 3KEVLAR 115.00 OPEN BRANCH FROM BUS 314283 TO BUS 314284 CKT 1 /* 3CENTLIA 115.00 - 3CHESTFLD 115.00 OPEN BRANCH FROM BUS 314284 TO BUS 314286 CKT 1 /* 3CHESTFLD 115.00 - 6CHESTF A 230.00 END
<b>DVP_P1-2: LN 72</b>	CONTINGENCY 'DVP_P1-2: LN 72' OPEN BRANCH FROM BUS 314277 TO BUS 314279 CKT 1 /* 3BELLW72 115.00 - 3BBOVERI 115.00 OPEN BRANCH FROM BUS 314277 TO BUS 314323 CKT 1 /* 3BELLW72 115.00 - 3NC GAS 115.00 OPEN BRANCH FROM BUS 314279 TO BUS 314313 CKT 1 /* 3BBOVERI 115.00 - 3KNGSLAND 115.00 OPEN BRANCH FROM BUS 314284 TO BUS 314336 CKT 1 /* 3CHESTFLD 115.00 - 3REYMT72 115.00 OPEN BRANCH FROM BUS 314313 TO BUS 314336 CKT 1 /* 3KNGSLAND 115.00 - 3REYMT72 115.00 OPEN BRANCH FROM BUS 314323 TO BUS 314327 CKT 1 /* 3NC GAS 115.00 - 3PLAZA 115.00 OPEN BUS 314277 /* ISLAND: 3BELLW72 115.00 OPEN BUS 314279 /* ISLAND: 3BBOVERI 115.00 OPEN BUS 314313 /* ISLAND: 3KNGSLAND 115.00 OPEN BUS 314323 /* ISLAND: 3NC GAS 115.00 OPEN BUS 314336 /* ISLAND: 3REYMT72 115.00 END
<b>DVP_P1-2: LN 53</b>	CONTINGENCY 'DVP_P1-2: LN 53' OPEN BRANCH FROM BUS 314284 TO BUS 314300 CKT 1 /* 3CHESTFLD 115.00 - 3KEVLAR 115.00 END
<b>DVP_P1-2: LN 570</b>	CONTINGENCY 'DVP_P1-2: LN 570' OPEN BRANCH FROM BUS 304183 TO BUS 314935 CKT 1 /* 8WAKE 500 TT500.00 - 8HERITAGE 500.00 END
<b>DVP_P1-2: LN 573</b>	CONTINGENCY 'DVP_P1-2: LN 573' OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
DVP_P1-2: LN 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_P4-2: 573T594	CONTINGENCY 'DVP_P4-2: 573T594' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 END
DVP_P1-2: LN 576	CONTINGENCY 'DVP_P1-2: LN 576' OPEN BRANCH FROM BUS 314914 TO BUS 314918 CKT 1 /* 8MDLTHAN 500.00 - 8NO ANNA 500.00 END
DVP_P1-2: LN 534	CONTINGENCY 'DVP_P1-2: LN 534' OPEN BRANCH FROM BUS 314907 TO BUS 314910 CKT 1 /* 8DOOMS 500.00 - 8CUNINGHAM 500.00 END
DVP_P4-2: H1T594	CONTINGENCY 'DVP_P4-2: H1T594' /* MORRISVILLE 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314063 TO BUS 314916 CKT 1 /* 6MORRSVL 230.00 - 8MORRSVL 500.00 OPEN BUS 314897 /* 8MORRS_1 500.00 KV END
Base Case	
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_P4-2: SPOTS H1T594	CONTINGENCY 'DVP_P4-2: SPOTS H1T594' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1 /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
<b>DVP_P4-2: 545T552</b>	CONTINGENCY 'DVP_P4-2: 545T552' /* BRISTERS 500 KV OPEN BRANCH FROM BUS 314900 TO BUS 314916 CKT 1 /* 8BRISTER 500.00 - 8MORRSVL 500.00 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
<b>DVP_P1-2: LN 574</b>	CONTINGENCY 'DVP_P1-2: LN 574' OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH 500.00 END
<b>DVP_P1-2: LN 581</b>	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

### 13.5.2 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
53338779	314284	3CHESTFLD	DVP	314300	3KEVLAR	DVP	1	DVP_P4-5: L92-4	breaker	202.0	58.63	100.29	DC	84.16

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deativation : 12/13/18)	27.4210
315059	1CHESTF4 (Deativation : 12/13/18)	44.4494
925051	AB2-160 C O1	2.1326
925052	AB2-160 E O1	3.4795
940071	AE1-249 C	2.8130
940072	AE1-249 E	2.0975
940431	AE2-027 C O1	11.3573
940432	AE2-027 E O1	7.5715
942371	AE2-250 C O1	3.7881
942372	AE2-250 E O1	1.9993
944631	AF1-128 O2	84.1550
LGEE	LGEE	0.0080
CPLE	CPLE	0.0827
WEC	WEC	0.0044
CBM-W2	CBM-W2	0.2211
NY	NY	0.0100
CBM-W1	CBM-W1	0.1501
TVA	TVA	0.0504
O-066	O-066	0.1277
CBM-S2	CBM-S2	0.5202
CBM-S1	CBM-S1	0.2726
G-007	G-007	0.0198
MADISON	MADISON	0.0202
MEC	MEC	0.0302

### 13.5.3 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
53338739	314279	3BBOVERI	DVP	314277	3BELLW72	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	72.6	108.86	DC	73.25

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deativation : 12/13/18)	23.8690
315059	1CHESTF4 (Deativation : 12/13/18)	38.6917
925051	AB2-160 C O1	1.9930
925052	AB2-160 E O1	3.2518
940071	AE1-249 C	2.6290
940072	AE1-249 E	1.9603
940431	AE2-027 C O1	10.1174
940432	AE2-027 E O1	6.7450
942371	AE2-250 C O1	3.5403
942372	AE2-250 E O1	1.8685
944631	AF1-128 O2	73.2540
LGEE	LGEE	0.0160
CPL	CPL	0.1773
WEC	WEC	0.0082
CBM-W2	CBM-W2	0.4668
NY	NY	0.0376
CBM-W1	CBM-W1	0.2752
TVA	TVA	0.1092
O-066	O-066	0.4906
CBM-S2	CBM-S2	1.1329
CBM-S1	CBM-S1	0.5879
G-007	G-007	0.0770
MADISON	MADISON	0.0423
MEC	MEC	0.0588

### 13.5.4 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
53338688	314284	3CHESTFLD	DVP	314234	3NRTHEST	DVP	1	DVP_P4-5: L92-3	breaker	165.0	66.5	120.23	DC	88.65

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deactivation : 12/13/18)	28.8870
315059	1CHESTF4 (Deactivation : 12/13/18)	46.8258
925051	AB2-160 C O1	2.4197
925052	AB2-160 E O1	3.9479
940071	AE1-249 C	3.1917
940072	AE1-249 E	2.3799
940431	AE2-027 C O1	12.2573
940432	AE2-027 E O1	8.1715
942371	AE2-250 C O1	4.2981
942372	AE2-250 E O1	2.2684
944631	AF1-128 O2	88.6542
LGEE	LGEE	0.0348
CPLE	CPLE	0.2514
WEC	WEC	0.0183
CBM-W2	CBM-W2	0.8272
NY	NY	0.0398
CBM-W1	CBM-W1	0.6755
TVA	TVA	0.1806
O-066	O-066	0.5443
CBM-S2	CBM-S2	1.6531
CBM-S1	CBM-S1	0.9883
G-007	G-007	0.0853
MADISON	MADISON	0.0585
MEC	MEC	0.1176

### 13.5.5 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
53338714	314284	3CHESTFLD	DVP	314336	3REYMT72	DVP	1	DVP_P4-6; CHESTER T132	breaker	202.0	75.12	111.39	DC	73.25

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deativation : 12/13/18)	23.8690
315059	1CHESTF4 (Deativation : 12/13/18)	38.6917
925051	AB2-160 C O1	1.9930
925052	AB2-160 E O1	3.2518
940071	AE1-249 C	2.6290
940072	AE1-249 E	1.9603
940431	AE2-027 C O1	10.1174
940432	AE2-027 E O1	6.7450
942371	AE2-250 C O1	3.5403
942372	AE2-250 E O1	1.8685
944631	AF1-128 O2	73.2540
LGEE	LGEE	0.0160
CPL	CPL	0.1773
WEC	WEC	0.0082
CBM-W2	CBM-W2	0.4668
NY	NY	0.0376
CBM-W1	CBM-W1	0.2752
TVA	TVA	0.1092
O-066	O-066	0.4906
CBM-S2	CBM-S2	1.1329
CBM-S1	CBM-S1	0.5879
G-007	G-007	0.0770
MADISON	MADISON	0.0423
MEC	MEC	0.0588

### 13.5.6 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
53338737	314313	3KNGSLAND	DVP	314279	3BBOVERI	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	72.89	109.16	DC	73.25

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deativation : 12/13/18)	23.8690
315059	1CHESTF4 (Deativation : 12/13/18)	38.6917
925051	AB2-160 C O1	1.9930
925052	AB2-160 E O1	3.2518
940071	AE1-249 C	2.6290
940072	AE1-249 E	1.9603
940431	AE2-027 C O1	10.1174
940432	AE2-027 E O1	6.7450
942371	AE2-250 C O1	3.5403
942372	AE2-250 E O1	1.8685
944631	AF1-128 O2	73.2540
LGEE	LGEE	0.0160
CPL	CPL	0.1773
WEC	WEC	0.0082
CBM-W2	CBM-W2	0.4668
NY	NY	0.0376
CBM-W1	CBM-W1	0.2752
TVA	TVA	0.1092
O-066	O-066	0.4906
CBM-S2	CBM-S2	1.1329
CBM-S1	CBM-S1	0.5879
G-007	G-007	0.0770
MADISON	MADISON	0.0423
MEC	MEC	0.0588

### 13.5.7 Index 6

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
53338777	314323	3NC GAS	DVP	314327	3PLAZA	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	64.53	100.79	DC	73.25

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deactivation : 12/13/18)	23.8690
315059	1CHESTF4 (Deactivation : 12/13/18)	38.6917
925051	AB2-160 C O1	1.9930
925052	AB2-160 E O1	3.2518
940071	AE1-249 C	2.6290
940072	AE1-249 E	1.9603
940431	AE2-027 C O1	10.1174
940432	AE2-027 E O1	6.7450
942371	AE2-250 C O1	3.5403
942372	AE2-250 E O1	1.8685
944631	AF1-128 O2	73.2540
LGEE	LGEE	0.0160
CPL	CPL	0.1773
WEC	WEC	0.0082
CBM-W2	CBM-W2	0.4668
NY	NY	0.0376
CBM-W1	CBM-W1	0.2752
TVA	TVA	0.1092
O-066	O-066	0.4906
CBM-S2	CBM-S2	1.1329
CBM-S1	CBM-S1	0.5879
G-007	G-007	0.0770
MADISON	MADISON	0.0423
MEC	MEC	0.0588

### 13.5.8 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
53338730	314336	3REYMT72	DVP	314313	3KNGSLAND	DVP	1	DVP_P4-6: CHESTER T132	breaker	202.0	73.54	109.8	DC	73.25

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deativation : 12/13/18)	23.8690
315059	1CHESTF4 (Deativation : 12/13/18)	38.6917
925051	AB2-160 C O1	1.9930
925052	AB2-160 E O1	3.2518
940071	AE1-249 C	2.6290
940072	AE1-249 E	1.9603
940431	AE2-027 C O1	10.1174
940432	AE2-027 E O1	6.7450
942371	AE2-250 C O1	3.5403
942372	AE2-250 E O1	1.8685
944631	AF1-128 O2	73.2540
LGEE	LGEE	0.0160
CPL	CPL	0.1773
WEC	WEC	0.0082
CBM-W2	CBM-W2	0.4668
NY	NY	0.0376
CBM-W1	CBM-W1	0.2752
TVA	TVA	0.1092
O-066	O-066	0.4906
CBM-S2	CBM-S2	1.1329
CBM-S1	CBM-S1	0.5879
G-007	G-007	0.0770
MADISON	MADISON	0.0423
MEC	MEC	0.0588

### 13.5.9 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
53338692	940430	AE2-027 TAP	DVP	314314	3LOCKS	DVP	1	DVP_P4-6; CHESTER T132	breaker	169.0	68.82	117.43	DC	82.16

Bus #	Bus	MW Impact
315058	1CHESTF3 (Deactivation : 12/13/18)	26.7710
315059	1CHESTF4 (Deactivation : 12/13/18)	43.3958
940431	AE2-027 C O1	41.1286
940432	AE2-027 E O1	27.4190
944631	AF1-128 O2	82.1602
DUCKCREEK	DUCKCREEK	0.1359
NEWTON	NEWTON	0.1375
FARMERCITY	FARMERCITY	0.0082
G-007A	G-007A	0.2206
VFT	VFT	0.5870
PRAIRIE	PRAIRIE	0.3874
COFFEEN	COFFEEN	0.0682
EDWARDS	EDWARDS	0.0403
CHEOAH	CHEOAH	0.1296
TILTON	TILTON	0.0706
GIBSON	GIBSON	0.0650
CALDERWOOD	CALDERWOOD	0.1262
BLUEG	BLUEG	0.1996
TRIMBLE	TRIMBLE	0.0629
CATAWBA	CATAWBA	0.1445

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
42883298	314905	8CHANCE	DVP	314900	8BRISTER	DVP	1	DVP_P1-2: LN 594	single	2442.12	141.39	141.5	DC	61.35

Bus #	Bus	MW Impact
314229	6MT RD221	0.1155
314236	6NRTHEST	0.1759
314241	6OLDCHRC	0.7115
314250	6ROCKVILLE	0.3134
315037	1LDYSMT1	4.5502
315038	1LDYSMT2	4.5472
315039	1LDYSMT3	4.8122
315040	1LDYSMT4	4.8212
315041	1LDYSMT5	4.8362
315043	1FOUR RIVERA	2.8433
315044	1FOUR RIVERB	2.8433
315045	1FOUR RIVERC	3.4882
315046	1FOUR RIVERD	2.8433
315047	1FOUR RIVERE	2.8433
315048	1FOUR RIVERF	3.4882
315058	1CHESTF3 (Deactivation : 12/13/18)	16.9907
315059	1CHESTF4 (Deactivation : 12/13/18)	27.5418
315067	1DARBY 1	2.4228
315068	1DARBY 2	2.4256
315069	1DARBY 3	2.4341
315070	1DARBY 4	2.4370
315074	1HOPCGN1 (Deactivation : 06/25/19)	7.7801
315075	1HOPCGN2 (Deactivation : 06/25/19)	7.6793
315083	1SPRUNCA (Deactivation : 01/12/19)	9.8906
315084	1SPRUNCB (Deactivation : 01/12/19)	9.8906
315090	1YORKTN1 (Deactivation : 09/09/18)	26.3583
315091	1YORKTN2 (Deactivation : 09/09/18)	27.3530
315225	1N ANNA1	33.4800
315226	1N ANNA2	33.4940
315610	6AA1-145GAS	9.9662
923831	AB2-022 C	2.0652
924061	AB2-050	0.5862
924241	AB2-068 OP	220.6920

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925051	AB2-160 C O1	5.0504
925061	AB2-161 C O1	3.0683
925331	AB2-190 C	18.6354
925861	AC1-065 C	3.1213
926001	AC1-076 C	3.8518
926291	AC1-107 O1	333.1200
926551	AC1-134	1.4656
926661	AC1-147 C	2.0487
926731	AC1-158 C	87.8897
926751	AC1-161 C O1	27.6533
926781	AC1-164 C	37.7875
927041	AC1-191 C O1	9.0494
927221	AC1-216 C O1	9.1092
932041	AC2-012 C	9.2680
932501	AC2-070 C	1.8832
932581	AC2-078 C O1	3.7266
932591	AC2-079 C O1	5.1879
932831	AC2-110 C	1.2485
933011	AC2-125	3.2145
933021	AC2-126	3.2361
933261	AC2-137 C	2.3025
933291	AC2-141 C	27.6533
933731	AC2-196 C	1.6195
934011	AD1-025 C	15.6585
934061	AD1-033 C	6.8033
934141	AD1-041 C	4.9044
934571	AD1-082 C	6.9926
935111	AD1-144 C	1.5659
935161	AD1-151 C O1	14.9749
935211	AD1-156 C	1.9463
936041	AD2-007 C	0.7480
936051	AD2-008 C	2.7261
936151	AD2-021	0.2626
936301	AD2-039 C	1.2485
936661	AD2-085 C	3.1136
936761	AD2-097 C	1.8758
937221	AD2-160 C O1	5.2838
937251	AD2-164	4.4117
937541	AD2-215 C	1.5820
938031	AE1-004 C	1.2485

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
938181	AE1-027 C	2.1175
938191	AE1-028 C	1.2285
938491	AE1-068 C O1	3.1048
938531	AE1-072 C O1	15.8149
938551	AE1-074 C	2.2693
938631	AE1-085 C O1	8.1583
939191	AE1-149 C O1	9.8282
939261	AE1-157 C O1	16.6554
939271	AE1-158 C O1	16.9980
939311	AE1-162 C	1.9677
939411	AE1-173 C	77.3976
939421	AE1-174 C	0.3358
939431	AE1-175 C	2.2331
939611	AE1-191 C	9.8088
939751	AE1-206 C O1	35.8245
940061	AE2-000BC O1	14.5342
940071	AE1-249 C	6.6619
940231	AE2-005 C	1.2485
940251	AE2-007 O1	157.3613
940431	AE2-027 C O1	12.0680
940471	AE2-031 C	26.8498
940481	AE2-033 C	13.7032
940541	AE2-040 O1	1.4506
940551	AE2-041 O1	6.6008
940641	AE2-051 C O1	14.4914
940651	AE2-052	1.7363
940891	AE2-078 C	2.1768
940901	AE2-079 C	2.1768
940911	AE2-080 C	2.1768
941031	AE2-094 C	32.1525
941101	AE2-104 C O1	3.1415
941281	AE2-122 C O1	13.6597
941291	AE2-123 C O1	14.0380
941301	AE2-124 C O1	12.7624
941381	AE2-134	2.6542
941501	AE2-147 C	14.1494
941581	AE2-155 C	0.7164
941591	AE2-156 O1	16.2631
941601	AE2-157 C	9.7364
942001	AE2-212 C	1.9956

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942131	AE2-225 C	1.9240
942151	AE2-227 C	2.0543
942161	AE2-228 C	2.0129
942171	AE2-229 C	1.9240
942191	AE2-231 C O1	6.3933
942341	AE2-247 C	0.7153
942371	AE2-250 C O1	8.9712
942401	AE2-253 C	5.5577
942551	AE2-270	24.9581
942851	AE2-304 C	0.5607
942931	AE2-313 C	29.0718
943431	AF1-014 C	0.6269
943451	AF1-016 C O2	0.6560
943461	AF1-017 C	0.6472
943471	AF1-018	3.4984
943611	AF1-032 C	0.8328
943621	AF1-033 C	1.1537
944011	AF1-069 C	5.5679
944061	AF1-074 C O2	3.5184
944501	AF1-115 C O2	3.5134
944581	AF1-123 C O2	20.9268
944591	AF1-124 C O2	20.9268
944601	AF1-125 C O2	20.9268
944631	AF1-128 O2	27.6365
944641	AF1-129 O2	50.7363
944871	AF1-152 C	2.4997
945361	AF1-201 C O2	7.9063
945711	AF1-236 C O2	39.6300
946001	AF1-265	31.4250
946011	AF1-266	6.0795
946261	AF1-291 C	1.0669
LGEE	LGEE	1.2933
CPL	CPL	7.4293
WEC	WEC	0.6398
CBM-W2	CBM-W2	28.5913
NY	NY	2.5703
CBM-W1	CBM-W1	22.5931
TVA	TVA	6.3112
CBM-S2	CBM-S2	51.8235
CBM-S1	CBM-S1	34.8553

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>MADISON</b>	MADISON	1.8588
<b>MEC</b>	MEC	4.0996
<b>AA2-074</b>	AA2-074	5.0625

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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
42883403	314908	8ELMONT	DVP	314911	8LADYSMITH	DVP	1	DVP_P1-2: LN 576	single	4070.2	115.35	115.9	DC	102.08

Bus #	Bus	MW Impact
314229	6MT RD221	0.1930
314236	6NRTHEST	0.2940
314241	6OLDCHRC	1.2143
314309	6IRON208	0.7011
314421	6WINCHST	0.2096
315058	1CHESTF3 (Deativation : 12/13/18)	33.2620
315059	1CHESTF4 (Deativation : 12/13/18)	53.9177
315060	1CHESTF5	15.9520
315061	1CHESTG7	6.1904
315062	1CHESTS7	2.8418
315063	1CHESTG8	6.0909
315064	1CHESTS8	3.1354
315067	1DARBY 1	4.0713
315068	1DARBY 2	4.0760
315069	1DARBY 3	4.0903
315070	1DARBY 4	4.0951
315074	1HOPCGN1 (Deativation : 06/25/19)	13.0619
315075	1HOPCGN2 (Deativation : 06/25/19)	12.8927
315083	1SPRUNCA (Deativation : 01/12/19)	16.1058
315084	1SPRUNCB (Deativation : 01/12/19)	16.1058
315090	1YORKTN1 (Deativation : 09/09/18)	53.1012
315091	1YORKTN2 (Deativation : 09/09/18)	55.1051
315092	1YORKTN3	36.7912
315233	1SURRY 2	40.1029
923801	AB2-015 C OP	12.6565
923831	AB2-022 C	3.4963
924241	AB2-068 OP	429.9996
925051	AB2-160 C O1	8.3605
925061	AB2-161 C O1	5.1414
925331	AB2-190 C	31.4170
925861	AC1-065 C	5.0333
926291	AC1-107 O1	649.0560
926661	AC1-147 C	3.4729

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
926751	AC1-161 C O1	47.2230
926781	AC1-164 C	77.2469
927041	AC1-191 C O1	14.4508
927221	AC1-216 C O1	15.3630
932041	AC2-012 C	15.7109
932501	AC2-070 C	3.2142
932581	AC2-078 C O1	6.2002
932591	AC2-079 C O1	8.7208
932831	AC2-110 C	2.0133
933061	AC2-130	0.6252
933261	AC2-137 C	3.9506
933291	AC2-141 C	47.2230
933731	AC2-196 C	2.7450
933991	AD1-023 C	18.9820
934011	AD1-025 C	26.4087
934061	AD1-033 C	11.5315
934141	AD1-041 C	7.8400
934521	AD1-076 C	78.9163
934571	AD1-082 C	11.7169
935111	AD1-144 C	2.6524
935161	AD1-151 C O1	25.2458
935211	AD1-156 C	3.2067
936041	AD2-007 C	1.2616
936051	AD2-008 C	4.5977
936151	AD2-021	0.4505
936301	AD2-039 C	2.0133
936661	AD2-085 C	5.2330
936711	AD2-090 C O1	10.4323
936761	AD2-097 C	3.0546
937221	AD2-160 C O1	8.9531
937251	AD2-164	7.5393
937541	AD2-215 C	2.6798
938031	AE1-004 C	2.0133
938181	AE1-027 C	3.5887
938191	AE1-028 C	2.0820
938491	AE1-068 C O1	79.1047
938501	AE1-069 C O1	36.3983
938531	AE1-072 C O1	26.7890
938551	AE1-074 C	3.6104
938631	AE1-085 C O1	13.5873

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
938771	AE1-103 C O1	5.3602
939191	AE1-149 C O1	16.3307
939311	AE1-162 C	3.3330
939411	AE1-173 C	126.8635
939421	AE1-174 C	0.6815
939431	AE1-175 C	4.5317
939611	AE1-191 C	15.6800
940061	AE2-000BC O1	24.3538
940071	AE1-249 C	11.0282
940231	AE2-005 C	2.0133
940251	AE2-007 O1	266.7649
940431	AE2-027 C O1	20.0191
940471	AE2-031 C	43.0714
940481	AE2-033 C	22.5081
940491	AE2-034 C	6.5332
940541	AE2-040 O1	2.3807
940551	AE2-041 O1	10.7600
940641	AE2-051 C O1	23.4809
940651	AE2-052	2.8851
940891	AE2-078 C	3.6910
940901	AE2-079 C	3.6910
940911	AE2-080 C	3.6910
941031	AE2-094 C	51.5873
941101	AE2-104 C O1	5.3033
941281	AE2-122 C O1	23.1526
941291	AE2-123 C O1	23.7937
941301	AE2-124 C O1	21.6312
941501	AE2-147 C	23.9338
941581	AE2-155 C	1.2228
941591	AE2-156 O1	27.5697
941601	AE2-157 C	16.2680
942001	AE2-212 C	3.2993
942131	AE2-225 C	3.2554
942151	AE2-227 C	4.0452
942161	AE2-228 C	3.3363
942171	AE2-229 C	3.2554
942341	AE2-247 C	1.2022
942371	AE2-250 C O1	14.8509
942401	AE2-253 C	9.4171
942551	AE2-270	42.0763

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942851	AE2-304 C	0.9481
942931	AE2-313 C	46.6360
943431	AF1-014 C	1.0109
943451	AF1-016 C O2	1.1100
943461	AF1-017 C	1.0877
943471	AF1-018	5.7028
943611	AF1-032 C	1.4091
943621	AF1-033 C	1.9563
944011	AF1-069 C	8.9334
944061	AF1-074 C O2	5.8694
944501	AF1-115 C O2	5.9573
944581	AF1-123 C O2	35.4693
944591	AF1-124 C O2	35.4693
944601	AF1-125 C O2	35.4693
944631	AF1-128 O2	102.0811
944641	AF1-129 O2	84.1700
944871	AF1-152 C	4.2283
945361	AF1-201 C O2	29.9691
945711	AF1-236 C O2	67.0719
946011	AF1-266	9.9858
946261	AF1-291 C	1.7687
LGEE	LGEE	3.3055
CPL	CPL	12.7173
WEC	WEC	1.7029
CBM-W2	CBM-W2	62.5552
NY	NY	3.9197
CBM-W1	CBM-W1	63.0504
TVA	TVA	12.8758
CBM-S2	CBM-S2	91.7228
CBM-S1	CBM-S1	72.9653
MADISON	MADISON	2.8022
MEC	MEC	9.9249
AA2-074	AA2-074	8.6769

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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
42883340	314911	8LADYSMITH	DVP	314905	8CHANCE	DVP	1	DVP_P1-2: LN 573	single	2738.22	127.62	127.72	DC	62.46

Bus #	Bus	MW Impact
314229	6MT RD221	0.1177
314236	6NRTHEST	0.1792
314241	6OLDCHRC	0.7252
314250	6ROCKVILLE	0.3187
315037	1LDYSMT1	4.6717
315038	1LDYSMT2	4.6686
315039	1LDYSMT3	4.9407
315040	1LDYSMT4	4.9499
315041	1LDYSMT5	4.9654
315043	1FOUR RIVERA	2.9044
315044	1FOUR RIVERB	2.9044
315045	1FOUR RIVERC	3.5631
315046	1FOUR RIVERD	2.9044
315047	1FOUR RIVERE	2.9044
315048	1FOUR RIVERF	3.5631
315058	1CHESTF3 (Deactivation : 12/13/18)	17.2992
315059	1CHESTF4 (Deactivation : 12/13/18)	28.0420
315067	1DARBY 1	2.4679
315068	1DARBY 2	2.4708
315069	1DARBY 3	2.4795
315070	1DARBY 4	2.4823
315074	1HOPCGN1 (Deactivation : 06/25/19)	7.9182
315075	1HOPCGN2 (Deactivation : 06/25/19)	7.8156
315083	1SPRUNCA (Deactivation : 01/12/19)	10.0577
315084	1SPRUNCB (Deactivation : 01/12/19)	10.0577
315090	1YORKTN1 (Deactivation : 09/09/18)	26.8273
315091	1YORKTN2 (Deactivation : 09/09/18)	27.8396
315225	1N ANNA1	34.0122
315226	1N ANNA2	34.0265
315610	6AA1-145GAS	10.1803
923831	AB2-022 C	2.0995
924061	AB2-050	0.5988
924241	AB2-068 OP	225.0274

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925051	AB2-160 C O1	5.1383
925061	AB2-161 C O1	3.1199
925331	AB2-190 C	18.9629
925861	AC1-065 C	3.1812
926291	AC1-107 O1	339.6640
926551	AC1-134	1.4971
926661	AC1-147 C	2.0833
926731	AC1-158 C	-58.9775
926751	AC1-161 C O1	28.1222
926781	AC1-164 C	45.2971
927041	AC1-191 C O1	9.2305
927221	AC1-216 C O1	9.2690
932041	AC2-012 C	9.4245
932501	AC2-070 C	1.9197
932581	AC2-078 C O1	3.7900
932591	AC2-079 C O1	5.2744
932831	AC2-110 C	1.2725
933011	AC2-125	3.3003
933021	AC2-126	3.3225
933261	AC2-137 C	2.3458
933291	AC2-141 C	28.1222
933731	AC2-196 C	1.6466
934011	AD1-025 C	15.9331
934061	AD1-033 C	6.9176
934141	AD1-041 C	4.9990
934571	AD1-082 C	7.1100
935111	AD1-144 C	1.5924
935161	AD1-151 C O1	15.2380
935211	AD1-156 C	1.9791
936041	AD2-007 C	0.7611
936051	AD2-008 C	2.7739
936151	AD2-021	0.2675
936301	AD2-039 C	1.2725
936661	AD2-085 C	3.1655
936761	AD2-097 C	1.9075
937221	AD2-160 C O1	5.3722
937251	AD2-164	4.4898
937541	AD2-215 C	1.6088
938031	AE1-004 C	1.2725
938181	AE1-027 C	2.1530

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
938191	AE1-028 C	1.2490
938491	AE1-068 C O1	12.8550
938531	AE1-072 C O1	16.0781
938551	AE1-074 C	2.3046
938631	AE1-085 C O1	8.2964
939191	AE1-149 C O1	9.9950
939261	AE1-157 C O1	17.0748
939271	AE1-158 C O1	17.4259
939311	AE1-162 C	2.0014
939411	AE1-173 C	78.6338
939421	AE1-174 C	0.3419
939431	AE1-175 C	2.2738
939611	AE1-191 C	9.9980
939751	AE1-206 C O1	36.5786
940061	AE2-000BC O1	14.7783
940071	AE1-249 C	6.7778
940231	AE2-005 C	1.2725
940251	AE2-007 O1	160.0096
940431	AE2-027 C O1	12.2816
940471	AE2-031 C	27.2447
940481	AE2-033 C	13.9173
940541	AE2-040 O1	1.4734
940551	AE2-041 O1	6.7276
940641	AE2-051 C O1	14.7194
940651	AE2-052	1.7658
940891	AE2-078 C	2.2146
940901	AE2-079 C	2.2146
940911	AE2-080 C	2.2146
941031	AE2-094 C	32.6350
941101	AE2-104 C O1	3.1936
941281	AE2-122 C O1	13.8888
941291	AE2-123 C O1	14.2734
941301	AE2-124 C O1	12.9764
941501	AE2-147 C	14.3812
941581	AE2-155 C	0.7303
941591	AE2-156 O1	16.5376
941601	AE2-157 C	9.9006
942001	AE2-212 C	2.0301
942131	AE2-225 C	1.9561
942151	AE2-227 C	2.0914

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942161	AE2-228 C	2.0482
942171	AE2-229 C	1.9561
942191	AE2-231 C O1	6.5490
942341	AE2-247 C	0.7272
942371	AE2-250 C O1	9.1272
942401	AE2-253 C	5.6506
942551	AE2-270	25.3967
942851	AE2-304 C	0.5699
942931	AE2-313 C	29.4994
943431	AF1-014 C	0.6389
943451	AF1-016 C O2	0.6669
943461	AF1-017 C	0.6580
943471	AF1-018	3.5656
943611	AF1-032 C	0.8466
943621	AF1-033 C	1.1737
944011	AF1-069 C	5.6514
944061	AF1-074 C O2	3.5779
944501	AF1-115 C O2	3.5746
944581	AF1-123 C O2	21.2779
944591	AF1-124 C O2	21.2779
944601	AF1-125 C O2	21.2779
944631	AF1-128 O2	28.1384
944641	AF1-129 O2	51.6309
944871	AF1-152 C	2.5407
945361	AF1-201 C O2	8.0478
945711	AF1-236 C O2	40.2929
946001	AF1-265	32.0865
946011	AF1-266	6.1744
946261	AF1-291 C	1.0857
LGEE	LGEE	1.2853
CPL	CPL	7.5074
WEC	WEC	0.6357
CBM-W2	CBM-W2	28.6077
NY	NY	2.5692
CBM-W1	CBM-W1	22.4179
TVA	TVA	6.3266
CBM-S2	CBM-S2	52.2685
CBM-S1	CBM-S1	34.9150
MADISON	MADISON	1.8809
MEC	MEC	4.0869

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>AA2-074</b>	AA2-074	5.1156

13.5.13

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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
42883328	314911	8LADYSMITH	DVP	314922	8POSSUM	DVP	1	DVP_P1-2: LN 594	single	2442.12	129.88	130.44	DC	52.21

Bus #	Bus	MW Impact
314229	6MT RD221	0.0980
314236	6NRTHEST	0.1497
314241	6OLDCHRC	0.6040
314250	6ROCKVILLE	0.2677
314309	6IRON208	0.3569
315043	1FOUR RIVERA	2.3650
315044	1FOUR RIVERB	2.3650
315045	1FOUR RIVERC	2.9013
315046	1FOUR RIVERD	2.3650
315047	1FOUR RIVERE	2.3650
315048	1FOUR RIVERF	2.9013
315058	1CHESTF3 (Deactivation : 12/13/18)	14.4610
315059	1CHESTF4 (Deactivation : 12/13/18)	23.4414
315060	1CHESTF5	8.0197
315067	1DARBY 1	2.0608
315068	1DARBY 2	2.0632
315069	1DARBY 3	2.0705
315070	1DARBY 4	2.0729
315074	1HOPCGN1 (Deactivation : 06/25/19)	6.6486
315075	1HOPCGN2 (Deactivation : 06/25/19)	6.5625
315083	1SPRUNCA (Deactivation : 01/12/19)	9.9482
315084	1SPRUNCB (Deactivation : 01/12/19)	9.9482
315090	1YORKTN1 (Deactivation : 09/09/18)	22.5417
315091	1YORKTN2 (Deactivation : 09/09/18)	23.3923
315225	1N ANNA1	28.3828
315226	1N ANNA2	28.3947
315610	6AA1-145GAS	8.2895
923831	AB2-022 C	1.7836
924061	AB2-050	0.4876
924241	AB2-068 OP	189.1040
925051	AB2-160 C O1	4.3241
925061	AB2-161 C O1	2.6420
925331	AB2-190 C	15.9565

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925861	AC1-065 C	2.6082
926291	AC1-107 O1	285.4400
926551	AC1-134	1.2190
926661	AC1-147 C	1.7645
926731	AC1-158 C	73.4024
926751	AC1-161 C O1	23.8059
926781	AC1-164 C	37.7700
927041	AC1-191 C O1	7.5420
927221	AC1-216 C O1	7.8012
932041	AC2-012 C	7.9821
932501	AC2-070 C	1.5987
932581	AC2-078 C O1	3.2018
932591	AC2-079 C O1	4.4713
932831	AC2-110 C	1.0433
933011	AC2-125	2.1405
933021	AC2-126	2.1549
933261	AC2-137 C	1.9572
933291	AC2-141 C	23.8059
933731	AC2-196 C	1.3956
934011	AD1-025 C	13.4101
934061	AD1-033 C	5.8627
934141	AD1-041 C	4.0887
934571	AD1-082 C	6.0209
935111	AD1-144 C	1.3486
935161	AD1-151 C O1	12.8222
935211	AD1-156 C	1.6720
936041	AD2-007 C	0.6406
936051	AD2-008 C	2.3347
936151	AD2-021	0.2232
936301	AD2-039 C	1.0433
936661	AD2-085 C	2.6833
936761	AD2-097 C	1.8867
937221	AD2-160 C O1	4.5561
937251	AD2-164	3.7758
937541	AD2-215 C	1.3625
938031	AE1-004 C	1.0433
938181	AE1-027 C	1.8252
938191	AE1-028 C	1.0589
938491	AE1-068 C O1	13.2631
938531	AE1-072 C O1	13.6434

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
938551	AE1-074 C	2.2884
938631	AE1-085 C O1	7.0116
939191	AE1-149 C O1	8.4410
939261	AE1-157 C O1	13.2766
939271	AE1-158 C O1	13.5496
939311	AE1-162 C	1.6905
939411	AE1-173 C	66.8549
939421	AE1-174 C	0.2865
939431	AE1-175 C	1.9051
939611	AE1-191 C	8.1773
939751	AE1-206 C O1	29.9524
940061	AE2-000BC O1	12.5146
940071	AE1-249 C	5.7038
940231	AE2-005 C	1.0433
940251	AE2-007 O1	135.5250
940431	AE2-027 C O1	10.3079
940471	AE2-031 C	23.3431
940481	AE2-033 C	11.8793
940541	AE2-040 O1	1.2562
940551	AE2-041 O1	5.5264
940641	AE2-051 C O1	12.5276
940651	AE2-052	1.4912
940891	AE2-078 C	1.8667
940901	AE2-079 C	1.8667
940911	AE2-080 C	1.8667
941031	AE2-094 C	27.9273
941101	AE2-104 C O1	2.7110
941281	AE2-122 C O1	11.7685
941291	AE2-123 C O1	12.0944
941301	AE2-124 C O1	10.9956
941501	AE2-147 C	12.2339
941581	AE2-155 C	0.6082
941591	AE2-156 O1	14.0063
941601	AE2-157 C	8.3762
942001	AE2-212 C	1.7096
942131	AE2-225 C	1.6595
942151	AE2-227 C	2.0591
942161	AE2-228 C	1.7219
942171	AE2-229 C	1.6595
942191	AE2-231 C O1	5.1480

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
942341	AE2-247 C	0.6165
942371	AE2-250 C O1	7.6809
942401	AE2-253 C	4.7923
942551	AE2-270	21.3703
942851	AE2-304 C	0.4853
942931	AE2-313 C	25.2749
943431	AF1-014 C	0.5238
943451	AF1-016 C O2	0.5658
943461	AF1-017 C	0.5578
943471	AF1-018	2.9290
943611	AF1-032 C	0.7183
943621	AF1-033 C	0.9893
944011	AF1-069 C	4.8362
944061	AF1-074 C O2	3.0254
944501	AF1-115 C O2	3.0130
944581	AF1-123 C O2	18.0298
944591	AF1-124 C O2	18.0298
944601	AF1-125 C O2	18.0298
944631	AF1-128 O2	23.5219
944641	AF1-129 O2	43.3795
944871	AF1-152 C	2.1613
945361	AF1-201 C O2	6.7524
945711	AF1-236 C O2	34.1512
946001	AF1-265	26.2740
946011	AF1-266	5.2703
946261	AF1-291 C	0.9127
LGEE	LGEE	1.8878
CPL	CPL	6.8961
WEC	WEC	0.9759
CBM-W2	CBM-W2	35.1105
NY	NY	2.7130
CBM-W1	CBM-W1	36.2039
TVA	TVA	7.1638
CBM-S2	CBM-S2	50.0317
CBM-S1	CBM-S1	40.7341
MADISON	MADISON	1.4818
MEC	MEC	5.6330
AA2-074	AA2-074	4.7061

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
42883263	314914	8MDLTHAN	DVP	314918	8NO ANNA	DVP	1	DVP_P1-2: LN 574	single	2442.12	150.55	150.78	DC	74.06

Bus #	Bus	MW Impact
314295	6BIRDNECK	0.0584
314491	3PENDLTN	0.4363
314507	3THOMPSN	0.4390
314947	8GREENSVILLE	70.1242
315058	1CHESTF3 (Deativation : 12/13/18)	20.5130
315059	1CHESTF4 (Deativation : 12/13/18)	33.2517
315074	1HOPCGN1 (Deativation : 06/25/19)	9.9214
315075	1HOPCGN2 (Deativation : 06/25/19)	9.7928
315083	1SPRUNCA (Deativation : 01/12/19)	13.1478
315084	1SPRUNCB (Deativation : 01/12/19)	13.1478
315090	1YORKTN1 (Deativation : 09/09/18)	34.8809
315091	1YORKTN2 (Deativation : 09/09/18)	36.1971
315098	1CHESPKA	0.5801
315099	1CHESPKB (Deativation : 05/31/19)	4.4206
315102	1BRUNSWICKG1	11.5172
315103	1BRUNSWICKG2	11.5172
315104	1BRUNSWICKG3	11.5172
315105	1BRUNSWICKS1	23.9269
315108	1ELIZAR1	4.2653
315109	1ELIZAR2	4.1912
315110	1ELIZAR3	4.3199
315260	1GOSPORTA	0.4632
315261	1GOSPORTB	0.5917
315262	1GOSPORTC	0.5022
315294	1DOMTR10	13.9077
315603	6AA1-139SOLA	3.2559
923262	AB1-132 C OP	17.8043
923263	AB1-132 E OP	7.6304
923572	AB1-173 C OP	2.8651
923582	AB1-173AC OP	2.8651
923801	AB2-015 C OP	11.1749
923831	AB2-022 C	3.0388
923911	AB2-031 C O1	2.8439

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
923991	AB2-040 C O1	9.3380
924501	AB2-099 C	0.7489
924511	AB2-100 C	14.8913
925051	AB2-160 C O1	6.7303
925061	AB2-161 C O1	4.3797
925121	AB2-169 C	8.1887
925171	AB2-174 C O1	8.9475
925331	AB2-190 C	24.6359
925781	AC1-054 C O1	3.2222
926071	AC1-086 C	26.2190
926201	AC1-098 C	7.6634
926211	AC1-099 C	2.5680
926661	AC1-147 C	3.5146
926751	AC1-161 C O1	47.7284
926781	AC1-164 C	42.8999
927021	AC1-189 C	10.5359
927141	AC1-208 C	11.1971
927221	AC1-216 C O1	12.0856
932041	AC2-012 C	15.8996
932581	AC2-078 C O1	5.2024
932591	AC2-079 C O1	7.4798
932631	AC2-084 C	10.9244
933261	AC2-137 C	2.2246
933291	AC2-141 C	47.7284
933501	AC2-165 C	12.0190
933731	AC2-196 C	2.7940
933991	AD1-023 C	16.9247
934011	AD1-025 C	20.7750
934061	AD1-033 C	11.7331
934201	AD1-047 C	10.1869
934331	AD1-057 C O1	12.3025
934521	AD1-076 C	70.1959
934571	AD1-082 C	9.9811
934611	AD1-087 C O1	10.0737
935111	AD1-144 C	2.2527
935161	AD1-151 C O1	19.7967
935171	AD1-152 C O1	10.0111
935211	AD1-156 C	2.7434
936041	AD2-007 C	0.9924
936051	AD2-008 C	3.6169

Bus #	Bus	MW Impact
936151	AD2-021	0.2537
936401	AD2-051 C O1	11.2517
936661	AD2-085 C	4.4869
936701	AD2-089 C (Withdrawn : 12/09/2019)	8.7730
936711	AD2-090 C O1	9.2699
936761	AD2-097 C	2.4936
937221	AD2-160 C O1	9.1243
937251	AD2-164	5.8975
937481	AD2-202 C O1	2.6696
937541	AD2-215 C	2.2759
937571	AD2-169 C	12.6812
938171	AE1-026 C O1	41.2480
938181	AE1-027 C	3.6544
938191	AE1-028 C	2.1201
938221	AE1-035 C	2.8784
938491	AE1-068 C O1	100.1892
938501	AE1-069 C O1	78.4394
938531	AE1-072 C O1	27.3299
938551	AE1-074 C	3.8759
938561	AE1-075 C	2.7287
938631	AE1-085 C O1	11.4253
938661	AE1-088	4.1993
938771	AE1-103 C O1	4.7195
939191	AE1-149 C O1	13.6649
939311	AE1-162 C	2.7609
939411	AE1-173 C	148.7136
939421	AE1-174 C	0.4212
939431	AE1-175 C	2.8008
940061	AE2-000BC O1	20.7460
940071	AE1-249 C	8.8778
940251	AE2-007 O1	270.2313
940431	AE2-027 C O1	15.4805
940471	AE2-031 C	54.6395
940481	AE2-033 C	20.7349
940491	AE2-034 C	5.7765
940521	AE2-037 C	10.2716
940541	AE2-040 O1	2.1934
940641	AE2-051 C O1	28.7901
940651	AE2-052	2.4141
940891	AE2-078 C	2.9668

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940901	AE2-079 C	2.9668
940911	AE2-080 C	2.9668
941031	AE2-094 C	65.5498
941101	AE2-104 C O1	4.5891
941281	AE2-122 C O1	44.3569
941291	AE2-123 C O1	45.5852
941301	AE2-124 C O1	41.4567
941501	AE2-147 C	20.8501
941541	AE2-151 C	1.3864
941591	AE2-156 O1	27.9100
941601	AE2-157 C	13.7751
942001	AE2-212 C	2.6685
942131	AE2-225 C	2.8190
942151	AE2-227 C	2.4775
942161	AE2-228 C	2.6082
942171	AE2-229 C	2.8190
942341	AE2-247 C	1.0306
942371	AE2-250 C O1	11.9551
942401	AE2-253 C	9.5972
942471	AE2-260 C O1	18.4876
942551	AE2-270	32.9945
942851	AE2-304 C	0.8282
942931	AE2-313 C	59.1614
943171	AE2-346 C	0.9526
943451	AF1-016 C O2	0.9612
943461	AF1-017 C	0.9325
943611	AF1-032 C	1.2201
943621	AF1-033 C	1.5724
943911	AF1-059	10.6093
944011	AF1-069 C	21.4176
944051	AF1-073 C O2	13.5896
944061	AF1-074 C O2	4.9531
944501	AF1-115 C O2	4.7890
944581	AF1-123 C O2	67.9779
944591	AF1-124 C O2	67.9779
944601	AF1-125 C O2	67.9779
944631	AF1-128 O2	33.3659
944641	AF1-129 O2	65.0192
944871	AF1-152 C	3.6835
945361	AF1-201 C O2	10.3665

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
945711	AF1-236 C O2	130.8453
945811	AF1-246 C O2	4.9615
946011	AF1-266	9.1991
946261	AF1-291 C	1.3819
946281	AF1-292 C	1.0149
946461	AF1-310 C O1 (Withdrawn : 11/05/2019)	13.4668
LGEE	LGEE	2.5741
CPL	CPL	12.1544
WEC	WEC	1.3312
CBM-W2	CBM-W2	52.1048
NY	NY	3.0255
CBM-W1	CBM-W1	49.0517
TVA	TVA	10.9606
CBM-S2	CBM-S2	85.2839
CBM-S1	CBM-S1	61.4462
MADISON	MADISON	2.7821
MEC	MEC	7.9863
AA2-074	AA2-074	8.2876

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
42883442	314916	8MORRSVL	DVP	314913	8LOUDOUN	DVP	1	DVP_P1-2: LN 580	single	2738.22	106.74	107.19	DC	38.91

Bus #	Bus	MW Impact
314078	3REMNGTN	0.2348
314250	6ROCKVILLE	0.2012
315021	1REMNGT1	4.7208
315022	1REMNGT2	4.7270
315023	1REMNGT3	4.7458
315024	1REMNGT4	4.7270
315028	1M RUN A	5.2437
315029	1M RUN B	5.2015
315030	1M RUN C	5.2437
315058	1CHESTF3 (Deativation : 12/13/18)	10.7755
315059	1CHESTF4 (Deativation : 12/13/18)	17.4670
315074	1HOPCGN1 (Deativation : 06/25/19)	4.9587
315075	1HOPCGN2 (Deativation : 06/25/19)	4.8945
315083	1SPRUNCA (Deativation : 01/12/19)	6.3814
315084	1SPRUNCB (Deativation : 01/12/19)	7.5075
315090	1YORKTN1 (Deativation : 09/09/18)	16.8451
315091	1YORKTN2 (Deativation : 09/09/18)	17.4808
315172	1LOISA A	1.8114
315173	1LOISA B	1.8208
315174	1LOISA C	1.8208
315175	1LOISA D	1.8208
315176	1LOISA E	3.7122
315177	1S ANNAG1	1.2511
315178	1S ANNAS1	0.6429
315179	1S ANNAG2	1.2511
315180	1S ANNAS2	0.6429
315225	1N ANNA1	25.2463
315226	1N ANNA2	25.2570
315270	1WARREN G1	11.9895
315271	1WARREN G2	11.9895
315272	1WARREN G3	11.9895
315273	1WARREN S1	22.4640
924241	AB2-068 OP	114.5712

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925021	AB2-158 C	10.8013
925051	AB2-160 C O1	3.2427
925061	AB2-161 C O1	1.9850
925331	AB2-190 C	11.9248
925671	AC1-043 C	7.9386
925861	AC1-065 C	1.9831
926001	AC1-076 C	4.9633
926291	AC1-107 O1	172.9376
926481	AC1-120 C O1	8.1592
926501	AC1-121 C O1	2.8021
926611	AC1-143 C O1	9.0137
926661	AC1-147 C	1.3269
926731	AC1-158 C	83.7093
926751	AC1-161 C O1	17.9027
926781	AC1-164 C	23.6589
927041	AC1-191 C O1	5.6533
927221	AC1-216 C O1	5.8314
932041	AC2-012 C	6.0025
932501	AC2-070 C	0.9935
932581	AC2-078 C O1	2.4056
932591	AC2-079 C O1	3.3594
932781	AC2-102 C	6.2861
932831	AC2-110 C	0.7932
933011	AC2-125	1.6149
933021	AC2-126	1.6258
933151	AC2-133 1	0.1776
933161	AC2-133 2	0.1776
933171	AC2-133 3	0.1776
933181	AC2-133 4	0.3328
933261	AC2-137 C	1.2269
933291	AC2-141 C	17.9027
933731	AC2-196 C	1.0497
934011	AD1-025 C	10.0240
934061	AD1-033 C	4.4093
934141	AD1-041 C	3.1199
934571	AD1-082 C	4.5237
934861	AD1-115 C	3.9693
935111	AD1-144 C	1.0126
935161	AD1-151 C O1	9.5824
935211	AD1-156 C	1.2594

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
936041	AD2-007 C	0.4789
936051	AD2-008 C	1.7451
936151	AD2-021	0.1399
936301	AD2-039 C	0.7932
936661	AD2-085 C	2.0160
936761	AD2-097 C	1.2103
937221	AD2-160 C O1	3.4256
937251	AD2-164	2.8235
937541	AD2-215 C	1.0230
938031	AE1-004 C	0.7932
938181	AE1-027 C	1.3726
938191	AE1-028 C	0.7963
938291	AE1-044 C O1	28.3972
938531	AE1-072 C O1	10.2542
938551	AE1-074 C	1.7544
938561	AE1-075 C	1.2531
938631	AE1-085 C O1	5.2679
939191	AE1-149 C O1	6.3419
939221	AE1-153 C O1	17.0352
939231	AE1-154 C	1.7707
939261	AE1-157 C O1	8.4402
939271	AE1-158 C O1	8.6137
939311	AE1-162 C	1.2681
939411	AE1-173 C	51.1469
939421	AE1-174 C	0.2129
939431	AE1-175 C	1.4161
939611	AE1-191 C	6.2399
939751	AE1-206 C O1	18.5975
940061	AE2-000BC O1	9.4026
940071	AE1-249 C	4.2773
940231	AE2-005 C	0.7932
940251	AE2-007 O1	101.9275
940431	AE2-027 C O1	7.7112
940471	AE2-031 C	9.2037
940551	AE2-041 O1	4.1851
940641	AE2-051 C O1	9.6382
940651	AE2-052	1.1204
940891	AE2-078 C	1.3975
940901	AE2-079 C	1.3975
940911	AE2-080 C	1.3975

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
941031	AE2-094 C	21.5131
941101	AE2-104 C O1	2.0369
941281	AE2-122 C O1	8.8507
941291	AE2-123 C O1	9.0958
941301	AE2-124 C O1	8.2694
941361	AE2-132	3.9513
941381	AE2-134	3.4201
941581	AE2-155 C	0.3780
941591	AE2-156 O1	10.5332
941601	AE2-157 C	6.2929
941831	AE2-188	8.2712
941851	AE2-190 C	5.0044
942001	AE2-212 C	1.2817
942131	AE2-225 C	1.2474
942151	AE2-227 C	1.3017
942161	AE2-228 C	1.2871
942171	AE2-229 C	1.2474
942191	AE2-231 C O1	3.2564
942341	AE2-247 C	0.4632
942371	AE2-250 C O1	5.7600
942401	AE2-253 C	3.6032
942551	AE2-270	15.9706
942931	AE2-313 C	19.4714
943431	AF1-014 C	0.3983
943451	AF1-016 C O2	0.4253
943461	AF1-017 C	0.4191
943471	AF1-018	2.2181
943611	AF1-032 C	0.5399
943621	AF1-033 C	0.7406
944011	AF1-069 C	3.7254
944061	AF1-074 C O2	2.2729
944111	AF1-079 C	3.3643
944501	AF1-115 C O2	2.2556
944581	AF1-123 C O2	13.5596
944591	AF1-124 C O2	13.5596
944601	AF1-125 C O2	13.5596
944631	AF1-128 O2	17.5270
944641	AF1-129 O2	32.3956
945361	AF1-201 C O2	5.0503
945711	AF1-236 C O2	25.7392

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>946001</b>	AF1-265	8.6462
<b>946261</b>	AF1-291 C	0.6822
<b>946371</b>	AF1-301 C	15.7859
<b>LGEE</b>	LGEE	0.5756
<b>CPL</b>	CPL	4.8534
<b>WEC</b>	WEC	0.2621
<b>CBM-W2</b>	CBM-W2	15.3890
<b>NY</b>	NY	2.1949
<b>CBM-W1</b>	CBM-W1	8.3442
<b>TVA</b>	TVA	3.6554
<b>CBM-S2</b>	CBM-S2	33.2870
<b>CBM-S1</b>	CBM-S1	19.7068
<b>MADISON</b>	MADISON	1.3245
<b>MEC</b>	MEC	1.9481
<b>AA2-074</b>	AA2-074	3.3048

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
42883420	314918	8NO ANNA	DVP	314934	8SPOTSYL	DVP	1	DVP_P1-2: LN 581	single	3218.56	115.16	115.21	DC	64.49

Bus #	Bus	MW Impact
314236	6NRTHEST	0.1824
314250	6ROCKVILLE	0.3351
314309	6IRON208	0.4399
314314	3LOCKS	0.2938
315058	1CHESTF3 (Deativation : 12/13/18)	17.8602
315059	1CHESTF4 (Deativation : 12/13/18)	28.9514
315065	1CHESTF6	19.9781
315067	1DARBY 1	2.5098
315068	1DARBY 2	2.5127
315069	1DARBY 3	2.5215
315070	1DARBY 4	2.5245
315074	1HOPCGN1 (Deativation : 06/25/19)	8.2748
315075	1HOPCGN2 (Deativation : 06/25/19)	8.1675
315083	1SPRUNCA (Deativation : 01/12/19)	12.5553
315084	1SPRUNCB (Deativation : 01/12/19)	12.5553
315090	1YORKTN1 (Deativation : 09/09/18)	28.2247
315091	1YORKTN2 (Deativation : 09/09/18)	29.2898
315108	1ELIZAR1	3.2126
315109	1ELIZAR2	3.1568
315110	1ELIZAR3	3.2537
315225	1N ANNA1	49.1912
315226	1N ANNA2	49.2119
315233	1SURRY 2	24.8852
924241	AB2-068 OP	187.7414
925051	AB2-160 C O1	6.3995
925061	AB2-161 C O1	3.3581
925331	AB2-190 C	19.9863
926291	AC1-107 O1	283.3832
926661	AC1-147 C	2.2520
926731	AC1-158 C	-133.4652
926751	AC1-161 C O1	35.7913
926781	AC1-164 C	38.9511
927221	AC1-216 C O1	9.7776

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
932041	AC2-012 C	10.1876
932501	AC2-070 C	1.6271
932581	AC2-078 C O1	4.0586
932591	AC2-079 C O1	5.6900
933261	AC2-137 C	2.0212
933291	AC2-141 C	35.7913
933731	AC2-196 C	1.7828
934011	AD1-025 C	16.8075
934061	AD1-033 C	7.4888
934571	AD1-082 C	7.6529
935111	AD1-144 C	1.7150
935161	AD1-151 C O1	16.0604
935211	AD1-156 C	2.5029
936041	AD2-007 C	0.8029
936051	AD2-008 C	2.9261
936151	AD2-021	0.2305
936661	AD2-085 C	3.4147
936761	AD2-097 C	2.3812
937221	AD2-160 C O1	5.8183
937251	AD2-164	4.7369
937541	AD2-215 C	1.7327
938181	AE1-027 C	2.3312
938191	AE1-028 C	1.3525
938491	AE1-068 C O1	57.1526
938501	AE1-069 C O1	36.0621
938531	AE1-072 C O1	17.4166
938551	AE1-074 C	2.9559
938631	AE1-085 C O1	8.8910
939191	AE1-149 C O1	10.6942
939311	AE1-162 C	2.1413
939411	AE1-173 C	103.7328
939421	AE1-174 C	0.3546
939431	AE1-175 C	2.3578
940061	AE2-000BC O1	15.9066
940071	AE1-249 C	8.4415
940251	AE2-007 O1	203.5540
940431	AE2-027 C O1	15.1452
940471	AE2-031 C	36.6775
940641	AE2-051 C O1	19.6398
940651	AE2-052	1.8893

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940891	AE2-078 C	2.3508
940901	AE2-079 C	2.3508
940911	AE2-080 C	2.3508
941031	AE2-094 C	43.9471
941281	AE2-122 C O1	15.0277
941291	AE2-123 C O1	15.4438
941301	AE2-124 C O1	14.0415
941581	AE2-155 C	0.6190
941591	AE2-156 O1	21.0340
941601	AE2-157 C	10.6345
942001	AE2-212 C	2.5310
942131	AE2-225 C	2.1178
942151	AE2-227 C	2.5379
942161	AE2-228 C	2.5324
942171	AE2-229 C	2.1178
942341	AE2-247 C	0.7845
942371	AE2-250 C O1	11.3675
942401	AE2-253 C	6.1198
942551	AE2-270	26.7674
942931	AE2-313 C	39.7128
943451	AF1-016 C O2	0.7221
943461	AF1-017 C	0.7098
943611	AF1-032 C	0.9167
943621	AF1-033 C	1.2459
944011	AF1-069 C	14.3592
944061	AF1-074 C O2	3.8387
944501	AF1-115 C O2	3.7946
944581	AF1-123 C O2	23.0242
944591	AF1-124 C O2	23.0242
944601	AF1-125 C O2	23.0242
944631	AF1-128 O2	29.0509
944641	AF1-129 O2	120.0988
945361	AF1-201 C O2	8.4500
945711	AF1-236 C O2	97.2385
946261	AF1-291 C	2.5324
LGEE	LGEE	1.3236
CPL	CPL	8.3495
WEC	WEC	0.6514
CBM-W2	CBM-W2	30.4422
NY	NY	2.7711

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>CBM-W1</b>	CBM-W1	22.7932
<b>TVA</b>	TVA	6.8054
<b>CBM-S2</b>	CBM-S2	57.7538
<b>CBM-S1</b>	CBM-S1	37.3943
<b>MADISON</b>	MADISON	2.1188
<b>MEC</b>	MEC	4.2696
<b>AA2-074</b>	AA2-074	5.6884

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
42883458	314919	80X	DVP	314904	8CLIFTON	DVP	1	DVP_P1-2: LN 569	single	2442.12	103.75	103.8	DC	37.42

Bus #	Bus	MW Impact
<b>314131</b>	6ARNOLDS	0.1721
<b>314134</b>	6CRANES	0.0383
315005	1POSSM 3 (Deactivation : 12/13/18)	12.7837
315006	1POSSM 4 (Deactivation : 12/13/18)	24.5689
315007	1POSSM 5 (Deactivation : 05/31/21)	87.0584
<b>315008</b>	1POSSM6A	2.9757
<b>315009</b>	1POSSM6B	2.9757
<b>315010</b>	1POSSM6S	4.6370
<b>315033</b>	1BIRCHWDA	4.5390
<b>315037</b>	1LDYSMT1	3.1029
<b>315038</b>	1LDYSMT2	3.1009
<b>315039</b>	1LDYSMT3	3.2816
<b>315040</b>	1LDYSMT4	3.2877
<b>315041</b>	1LDYSMT5	3.2980
<b>315043</b>	1FOUR RIVERA	1.7818
<b>315044</b>	1FOUR RIVERB	1.7818
<b>315045</b>	1FOUR RIVERC	2.1859
<b>315046</b>	1FOUR RIVERD	1.7818
<b>315047</b>	1FOUR RIVERE	1.7818
<b>315048</b>	1FOUR RIVERF	2.1859
315058	1CHESTF3 (Deactivation : 12/13/18)	10.3649
315059	1CHESTF4 (Deactivation : 12/13/18)	16.8015
315074	1HOPCGN1 (Deactivation : 06/25/19)	4.7155
315075	1HOPCGN2 (Deactivation : 06/25/19)	4.6544
315083	1SPRUNCA (Deactivation : 01/12/19)	6.0018
315084	1SPRUNCB (Deactivation : 01/12/19)	6.0018
315090	1YORKTN1 (Deactivation : 09/09/18)	15.9734
315091	1YORKTN2 (Deactivation : 09/09/18)	16.5761
<b>315225</b>	1N ANNA1	19.4117
<b>315226</b>	1N ANNA2	19.4199
<b>315610</b>	6AA1-145GAS	6.2455
<b>924061</b>	AB2-050	0.3674
<b>924241</b>	AB2-068 OP	111.6699
<b>925021</b>	AB2-158 C	6.1727

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
925051	AB2-160 C O1	3.0579
925061	AB2-161 C O1	1.8458
925331	AB2-190 C	11.2698
925861	AC1-065 C	1.9795
926001	AC1-076 C	2.6236
926291	AC1-107 O1	168.5584
926481	AC1-120 C O1	3.8571
926501	AC1-121 C O1	1.3247
926551	AC1-134	0.9185
926661	AC1-147 C	1.2293
926731	AC1-158 C	50.4813
926751	AC1-161 C O1	16.5659
926781	AC1-164 C	23.0546
927041	AC1-191 C O1	5.7346
927221	AC1-216 C O1	5.5072
932041	AC2-012 C	5.5611
932501	AC2-070 C	0.9748
932581	AC2-078 C O1	2.2467
932591	AC2-079 C O1	3.1172
932781	AC2-102 C	2.9331
932831	AC2-110 C	0.7918
933011	AC2-125	2.1921
933021	AC2-126	2.2068
933261	AC2-137 C	1.1929
933271	AC2-138 C	0.5204
933291	AC2-141 C	16.5659
933731	AC2-196 C	0.9712
934011	AD1-025 C	9.4667
934061	AD1-033 C	4.0802
934141	AD1-041 C	3.1263
934191	AD1-046 C	4.0337
934571	AD1-082 C	4.2064
934781	AD1-105 C	4.9741
935111	AD1-144 C	0.9410
935161	AD1-151 C O1	9.0561
935211	AD1-156 C	1.1736
936041	AD2-007 C	0.4522
936051	AD2-008 C	1.6481
936151	AD2-021	0.1360
936301	AD2-039 C	0.7918

Bus #	Bus	MW Impact
936341	AD2-044 C	0.1626
936581	AD2-073 C	1.4600
936591	AD2-074 C	3.4909
936661	AD2-085 C	1.8710
936761	AD2-097 C	1.1383
937221	AD2-160 C O1	3.1683
937251	AD2-164	2.6712
937541	AD2-215 C	0.9507
938031	AE1-004 C	0.7918
938181	AE1-027 C	1.2698
938191	AE1-028 C	0.7367
938551	AE1-074 C	1.3760
938631	AE1-085 C O1	4.9172
938961	AE1-124 C	1.7475
939191	AE1-149 C O1	5.9277
939231	AE1-154 C	1.0119
939241	AE1-155 C	9.5816
939261	AE1-157 C O1	11.0958
939271	AE1-158 C O1	11.3240
939281	AE1-159 C O1 (Withdrawn : 12/20/2019)	10.0237
939311	AE1-162 C	1.1847
939411	AE1-173 C	27.9683
939421	AE1-174 C	0.2040
939431	AE1-175 C	1.3564
939611	AE1-191 C	6.2526
939751	AE1-206 C O1	18.9333
940061	AE2-000BC O1	8.7432
940071	AE1-249 C	4.0336
940231	AE2-005 C	0.7918
940251	AE2-007 O1	94.4102
940431	AE2-027 C O1	7.3287
940551	AE2-041 O1	4.1681
940651	AE2-052	1.0472
940891	AE2-078 C	1.3141
940901	AE2-079 C	1.3141
940911	AE2-080 C	1.3141
941141	AE2-108 C	0.4874
941151	AE2-109 C	0.1706
941281	AE2-122 C O1	8.1936
941291	AE2-123 C O1	8.4204

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
941301	AE2-124 C O1	7.6553
941381	AE2-134	1.8079
941581	AE2-155 C	0.3709
941591	AE2-156 O1	9.7580
941601	AE2-157 C	5.8619
941831	AE2-188	3.8593
942001	AE2-212 C	1.2066
942151	AE2-227 C	1.2495
942161	AE2-228 C	1.2187
942191	AE2-231 C O1	4.2003
942341	AE2-247 C	0.4298
942371	AE2-250 C O1	5.4318
942401	AE2-253 C	3.3325
942551	AE2-270	15.0935
943431	AF1-014 C	0.3976
943461	AF1-017 C	0.3889
943471	AF1-018	2.2091
943601	AF1-031 C	4.1433
943621	AF1-033 C	0.6965
943741	AF1-042 C	0.9681
943991	AF1-067 C	1.7409
944061	AF1-074 C O2	2.1194
944111	AF1-079 C	1.0190
944491	AF1-114 C	5.5541
944501	AF1-115 C O2	2.1209
944581	AF1-123 C O2	12.5526
944591	AF1-124 C O2	12.5526
944601	AF1-125 C O2	12.5526
944631	AF1-128 O2	16.8592
944641	AF1-129 O2	30.7319
945361	AF1-201 C O2	4.8042
945711	AF1-236 C O2	23.7465
945831	AF1-248	0.1207
946001	AF1-265	8.8023
946261	AF1-291 C	0.6460
946371	AF1-301 C	4.7977
LGEE	LGEE	0.3994
CPL	CPL	4.3044
WEC	WEC	0.1685
CBM-W2	CBM-W2	12.2850

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>NY</b>	<b>NY</b>	<b>1.9571</b>
<b>CBM-W1</b>	<b>CBM-W1</b>	<b>4.7788</b>
<b>TVA</b>	<b>TVA</b>	<b>3.0436</b>
<b>CBM-S2</b>	<b>CBM-S2</b>	<b>29.2526</b>
<b>CBM-S1</b>	<b>CBM-S1</b>	<b>16.1880</b>
<b>MADISON</b>	<b>MADISON</b>	<b>1.2156</b>
<b>MEC</b>	<b>MEC</b>	<b>1.4269</b>
<b>AA2-074</b>	<b>AA2-074</b>	<b>2.9299</b>

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
42883355	314934	8SPOTSYL	DVP	314916	8MORRSVL	DVP	1	DVP_P1-2: LN 581	single	3218.56	119.0	119.04	DC	62.71

Bus #	Bus	MW Impact
314236	6NRTHEST	0.1774
314250	6ROCKVILLE	0.3261
314309	6IRON208	0.4278
314314	3LOCKS	0.2858
315058	1CHESTF3 (Deactivation : 12/13/18)	17.3680
315059	1CHESTF4 (Deactivation : 12/13/18)	28.1536
315065	1CHESTF6	19.4300
315067	1DARBY 1	2.4405
315068	1DARBY 2	2.4433
315069	1DARBY 3	2.4519
315070	1DARBY 4	2.4547
315074	1HOPCGN1 (Deactivation : 06/25/19)	8.0473
315075	1HOPCGN2 (Deactivation : 06/25/19)	7.9430
315080	1HOPHCF4	3.5963
315083	1SPRUNCA (Deactivation : 01/12/19)	12.2160
315084	1SPRUNCB (Deactivation : 01/12/19)	12.2160
315090	1YORKTN1 (Deactivation : 09/09/18)	27.4436
315091	1YORKTN2 (Deactivation : 09/09/18)	28.4792
315108	1ELIZAR1	3.1240
315109	1ELIZAR2	3.0698
315110	1ELIZAR3	3.1640
315225	1N ANNA1	47.5959
315226	1N ANNA2	47.6159
315233	1SURRY 2	24.1964
924241	AB2-068 OP	182.4975
925021	AB2-158 C	10.5753
925051	AB2-160 C O1	6.2238
925061	AB2-161 C O1	3.2660
925331	AB2-190 C	19.4360
926291	AC1-107 O1	275.4680
926661	AC1-147 C	2.1900
926731	AC1-158 C	183.2819
926751	AC1-161 C O1	34.8006

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
926781	AC1-164 C	35.9601
927221	AC1-216 C O1	9.5084
932041	AC2-012 C	9.9071
932501	AC2-070 C	1.5818
932581	AC2-078 C O1	3.9473
933261	AC2-137 C	1.9652
933291	AC2-141 C	34.8006
933731	AC2-196 C	1.7337
934011	AD1-025 C	16.3447
934061	AD1-033 C	7.2824
934571	AD1-082 C	7.4431
935111	AD1-144 C	1.6680
935161	AD1-151 C O1	15.6182
935211	AD1-156 C	2.4343
936041	AD2-007 C	0.7808
936051	AD2-008 C	2.8456
936151	AD2-021	0.2241
936761	AD2-097 C	2.3168
937221	AD2-160 C O1	5.6582
937251	AD2-164	4.6060
937541	AD2-215 C	1.6852
938181	AE1-027 C	2.2671
938191	AE1-028 C	1.3153
938491	AE1-068 C O1	55.6030
938531	AE1-072 C O1	16.9388
938551	AE1-074 C	2.8776
938631	AE1-085 C O1	8.6475
939191	AE1-149 C O1	10.4009
939231	AE1-154 C	1.7337
939311	AE1-162 C	2.0823
939411	AE1-173 C	100.8672
939421	AE1-174 C	0.3447
939431	AE1-175 C	2.2924
940061	AE2-000BC O1	15.4706
940071	AE1-249 C	8.2097
940251	AE2-007 O1	197.9419
940431	AE2-027 C O1	14.7290
940471	AE2-031 C	35.6857
940641	AE2-051 C O1	19.0971
940651	AE2-052	1.8375

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
940891	AE2-078 C	2.2861
940901	AE2-079 C	2.2861
940911	AE2-080 C	2.2861
941031	AE2-094 C	42.7474
941281	AE2-122 C O1	14.6140
941291	AE2-123 C O1	15.0186
941301	AE2-124 C O1	13.6548
941581	AE2-155 C	0.6018
941591	AE2-156 O1	20.4540
941601	AE2-157 C	10.3433
942001	AE2-212 C	2.4617
942131	AE2-225 C	2.0597
942151	AE2-227 C	2.4683
942161	AE2-228 C	2.4629
942171	AE2-229 C	2.0597
942371	AE2-250 C O1	11.0554
942401	AE2-253 C	5.9515
942551	AE2-270	26.0304
942931	AE2-313 C	38.6390
943451	AF1-016 C O2	0.7023
943611	AF1-032 C	0.8915
943621	AF1-033 C	1.2116
944011	AF1-069 C	13.9672
944061	AF1-074 C O2	3.7336
944111	AF1-079 C	1.7458
944501	AF1-115 C O2	3.6899
944581	AF1-123 C O2	22.3902
944591	AF1-124 C O2	22.3902
944601	AF1-125 C O2	22.3902
944631	AF1-128 O2	28.2503
944641	AF1-129 O2	116.8043
945361	AF1-201 C O2	8.2156
945711	AF1-236 C O2	94.5579
946261	AF1-291 C	2.4629
946371	AF1-301 C	18.4577
LGEE	LGEE	1.3030
CPL	CPL	8.1523
WEC	WEC	0.6410
CBM-W2	CBM-W2	29.8771
NY	NY	2.7274

<b>Bus #</b>	<b>Bus</b>	<b>MW Impact</b>
<b>CBM-W1</b>	CBM-W1	22.4304
<b>TVA</b>	TVA	6.6752
<b>CBM-S2</b>	CBM-S2	56.4590
<b>CBM-S1</b>	CBM-S1	36.6871
<b>MADISON</b>	MADISON	2.0684
<b>MEC</b>	MEC	4.1950
<b>AA2-074</b>	AA2-074	5.5543

# Short Circuit

### 13.6 Short Circuit

The following Breakers are overdutied:

Bus Number	Bus Name	BREAKER	Type	Capacity (Amps)	Duty Percentage Post Queue	Duty Percentage Pre Queue
314284	CHESTERF 2&4 115.kV	SX72	S	40000	127.60%	97.91%
314284	CHESTERF 2&4 115.kV	SX42	S	40000	127.60%	97.91%
314284	CHESTERF 2&4 115.kV	T132	S	40000	127.60%	97.91%
314284	CHESTERF 2&4 115.kV	SX52	S	40000	127.60%	97.91%
314284	CHESTERF 2&4 115.kV	L92-4	S	40000	127.60%	97.91%
314284	CHESTERF 2&4 115.kV	L92-3	S	40000	127.60%	97.91%
314284	CHESTERF 2&4 115.kV	9212	S	40000	122.89%	93.36%
314284	CHESTERF 2&4 115.kV	8612	S	40000	122.84%	93.31%
314284	CHESTERF 2&4 115.kV	7212	S	40000	121.81%	92.28%
314284	CHESTERF 2&4 115.kV	T242	S	42782.6	119.30%	91.54%
314284	CHESTERF 2&4 115.kV	1712	S	40000	119.20%	89.77%
314284	CHESTERF 2&4 115.kV	5312	S	40000	119.05%	89.58%
314284	CHESTERF 2&4 115.kV	SX12	S	50000	102.08%	78.33%
314284	CHESTERF 2&4 115.kV	SX4X2	S	50000	102.08%	78.33%
314284	CHESTERF 2&4 115.kV	SX632	S	50000	102.08%	78.33%
314284	CHESTERF 2&4 115.kV	SX642	S	50000	102.08%	78.33%
314286	CHESTERF 5&6 230.kV	G8TH9	S	40000	100.02%	97.16%

## Affected Systems

## 14 Affected Systems

### 14.1 Duke Energy Progress

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

**Attachment 1**  
System Configuration