



**Generation Interconnection  
Feasibility Study Report  
for  
Queue Project AF1-123  
FENTRESS 500 KV  
267.5 MW Capacity / 880 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.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

An Interconnection Customer with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

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 an offshore wind generating facility located in the city of Chesapeake, Virginia. The installed facilities will have a total capability of 880 MW with 267.5 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is 12/31/2025. This study does not imply a TO commitment to this in-service date.

|                            |                        |
|----------------------------|------------------------|
| <b>Queue Number</b>        | <b>AF1-123</b>         |
| <b>Project Name</b>        | <b>FENTRESS 500 KV</b> |
| <b>State</b>               | Virginia               |
| <b>Location</b>            | City of Chesapeake     |
| <b>Transmission Owner</b>  | Dominion               |
| <b>MFO</b>                 | 880                    |
| <b>MWE</b>                 | 880                    |
| <b>MWC</b>                 | 267.5                  |
| <b>Fuel</b>                | Offshore Wind          |
| <b>Basecase Study Year</b> | 2023                   |

#### 3.1 Primary Point of Interconnection

The AF1-123 project will interconnect with the Dominion transmission system. The primary Point of Interconnection is a new 5 breaker, 230kV breaker-and-a-half substation. Two of the new positions will be for the interconnection of the AF1-123 project with the third for the new 230kV, 14 mile line to the Fentress substation. The new 230kV line will terminate at Fentress substation where it will be converted to 500kV via a new 500/230 kV auto-transformer. Two new 500kV breakers will be required to expand the Fentress substation to accommodate the addition of the new auto-transformer.

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 AF1-123 project selected a secondary POI as a direct connection into the existing Lanstown 230 kV substation in the city of Virginia Beach, Virginia.

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 AF1-123 project will be responsible for the following costs:

| Description                                   | Total Cost           |
|-----------------------------------------------|----------------------|
| <b>Attachment Facilities</b>                  | Included below       |
| <b>Direct Connection Network Upgrade</b>      | \$ 71,200,000        |
| <b>Non Direct Connection Network Upgrades</b> | \$ 5,000,000         |
| <b>Total Costs</b>                            | <b>\$ 76,200,000</b> |

In addition, the AF1-123 project may be responsible for a contribution to the following costs

| Description            | Total Cost            |
|------------------------|-----------------------|
| <b>System Upgrades</b> | <b>\$ 909,886,000</b> |

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 AF1-123. The project was evaluated as a 243.5 MW Capacity (880 MW Energy) injection at the existing Fentress 500 kV substation, City of Chesapeake county, Virginia 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 AF1-123 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 AF1-123 Project, Dominion Energy will construct a new 230 kV, onshore GIS switchyard which is detailed below in the 'Direct Connection Cost Estimate'. A cost estimate for the Attachment Facilities are currently included in the estimate below, and will be broken out and detailed separately in the project's Facilities Study.

## 6 Direct Connection Cost Estimate

To accommodate the proposed AF1-123 Project, Dominion Energy will construct a new 230 kV onshore GIS switchyard, add five 230 kV breakers at new switchyard, construct one 14 mile 230 kV line from new GIS switchyard to Fentress station, add one 500-230 kV transformer bank, and add a 230 kV breaker.

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

| Description                                                | Total Cost           |
|------------------------------------------------------------|----------------------|
| <b>New 230 kV GIS Switchyard with five 230 kV breakers</b> | \$ 17,000,000        |
| <b>New 14 mile 230 kV Transmission Line</b>                | \$ 28,000,000        |
| <b>New 500-230 kV transformer bank</b>                     | \$ 25,000,000        |
| <b>One 230 kV Breaker</b>                                  | \$ 1,200,000         |
|                                                            |                      |
| <b>Total Direct Connection Facility Costs</b>              | <b>\$ 71,200,000</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.

## 7 Non-Direct Connection Cost Estimate

To accommodate the proposed AF1-123 Project, Dominion Energy will expand the existing 500 kV Fentress substation and add the necessary elements to the station 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         |
|---------------------------------------------------|--------------------|
| Substation (two 500 kV Breakers)                  | \$ 4,000,000       |
| Substation (Expand Fentress Station)              | \$ 1,000,000       |
|                                                   |                    |
| <b>Total Non-Direct Connection Facility Costs</b> | <b>\$5,000,000</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.

Additional Requirements: During the System Impact Study, it may be determined that dynamic devices are required to support the interconnection. Costs and schedules associated with the addition of these devices will be determined at that time.

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 AF1-123 project to the system does not result in any newly overdutied circuit breakers on the Dominion transmission system and does not have a significant fault current contribution to existing overdutied circuit breakers

### 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 AF1-123 was evaluated as an 880.0 MW (Capacity 267.5 MW) injection at the Fentress 500 kV substation in the Dominion area. Project AF1-123 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-123 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 | CK T ID | CONT NAME        | Type   | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPACT |
|----------|-----------|----------|-------|---------------|---------|----------|-------|-------------|---------|------------------|--------|------------|------------------------|-------------------------|--------|-----------|
| 42880913 | 314902    | 8CARSON  | 500.0 | DVP           | 314914  | 8MDLTHAN | 500.0 | DVP         | 1       | DVP_P1-2: LN 574 | single | 3218.56    | 99.74                  | 101.69                  | DC     | 62.37     |

## 12.2 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 | CK T ID | CONT NAME         | Type    | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPACT |
|----------|-----------|----------|-------|---------------|---------|-----------|-------|-------------|---------|-------------------|---------|------------|------------------------|-------------------------|--------|-----------|
| 42880775 | 314918    | 8NO ANNA | 500.0 | DVP           | 314934  | 8SPOTSY L | 500.0 | DVP         | 1       | DVP_P4-2: 568T575 | breaker | 3938.0     | 99.85                  | 100.09                  | DC     | 158.58    |

## 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 | CK T ID | CONT NAME         | Type    | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPACT |
|----------|-----------|----------|-------|---------------|---------|----------|-------|-------------|---------|-------------------|---------|------------|------------------------|-------------------------|--------|-----------|
| 42880723 | 314902    | 8CARSON  | 500.0 | DVP           | 314914  | 8MDLTHAN | 500.0 | DVP         | 1       | DVP_P4-2: 557T574 | breaker | 3938.0     | 112.09                 | 116.07                  | DC     | 274.49    |
| 42880724 | 314902    | 8CARSON  | 500.0 | DVP           | 314914  | 8MDLTHAN | 500.0 | DVP         | 1       | DVP_P4-2: H2T557  | breaker | 3938.0     | 106.02                 | 109.88                  | DC     | 266.23    |
| 42880910 | 314902    | 8CARSON  | 500.0 | DVP           | 314914  | 8MDLTHAN | 500.0 | DVP         | 1       | DVP_P1-2: LN 557  | single  | 3218.56    | 119.49                 | 120.01                  | DC     | 71.83     |
| 42880713 | 314903    | 8CHCKAHM | 500.0 | DVP           | 314908  | 8ELMONT  | 500.0 | DVP         | 1       | DVP_P4-2: 56372   | breaker | 3144.0     | 136.95                 | 138.3                   | DC     | 290.12    |
| 42880714 | 314903    | 8CHCKAHM | 500.0 | DVP           | 314908  | 8ELMONT  | 500.0 | DVP         | 1       | DVP_P4-2: 563T576 | breaker | 3144.0     | 136.6                  | 138.0                   | DC     | 293.67    |
| 42880843 | 314903    | 8CHCKAHM | 500.0 | DVP           | 314908  | 8ELMONT  | 500.0 | DVP         | 1       | DVP_P1-2: LN 563  | single  | 2442.12    | 162.22                 | 163.17                  | DC     | 77.8      |
| 42880844 | 314903    | 8CHCKAHM | 500.0 | DVP           | 314908  | 8ELMONT  | 500.0 | DVP         | 1       | DVP_P1-2: LN 576  | single  | 2442.12    | 160.28                 | 161.05                  | DC     | 77.6      |
| 42880852 | 314903    | 8CHCKAHM | 500.0 | DVP           | 314908  | 8ELMONT  | 500.0 | DVP         | 1       | Base Case         | single  | 2442.12    | 131.86                 | 132.64                  | DC     | 62.64     |
| 42880748 | 314905    | 8CHANCE  | 500.0 | DVP           | 314900  | 8BRISTER | 500.0 | DVP         | 1       | DVP_P4-2: H1T594  | breaker | 3351.0     | 105.85                 | 105.9                   | DC     | 168.68    |
| 42880749 | 314905    | 8CHANCE  | 500.0 | DVP           | 314900  | 8BRISTER | 500.0 | DVP         | 1       | DVP_P4-2: 573T594 | breaker | 3351.0     | 105.28                 | 105.32                  | DC     | 168.3     |

| ID       | FROM BUS# | FROM BUS    | kV    | FROM BUS AREA | TO BUS# | TO BUS      | kV    | TO BUS AREA | CK T ID | CONT NAME              | Type    | Rating MVA | PRE PROJE C T LOADIN G % | POST PROJE C T LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|-------------|-------|---------------|---------|-------------|-------|-------------|---------|------------------------|---------|------------|--------------------------|---------------------------|--------|------------|
| 42880898 | 314905    | 8CHANCE     | 500.0 | DVP           | 314900  | 8BRISTER    | 500.0 | DVP         | 1       | DVP_P1-2: LN 594       | single  | 2442.12    | 141.15                   | 141.24                    | DC     | 46.58      |
| 42880900 | 314905    | 8CHANCE     | 500.0 | DVP           | 314900  | 8BRISTER    | 500.0 | DVP         | 1       | DVP_P1-2: LN 573       | single  | 2442.12    | 134.97                   | 135.48                    | DC     | 45.75      |
| 42881003 | 314908    | 8ELMONT     | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P1-2: LN 576       | single  | 4070.2     | 114.84                   | 115.01                    | DC     | 79.0       |
| 42880733 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P4-2: SPOTS H1T594 | breaker | 3351.0     | 110.33                   | 110.38                    | DC     | 170.43     |
| 42880734 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P4-2: H1T594       | breaker | 3351.0     | 105.95                   | 106.0                     | DC     | 165.15     |
| 42880768 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P4-2: 545T552      | breaker | 3637.0     | 101.76                   | 101.81                    | DC     | 154.37     |
| 42880927 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P1-2: LN 573       | single  | 2442.12    | 128.95                   | 129.41                    | DC     | 40.25      |
| 42880928 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P1-2: LN 594       | single  | 2442.12    | 128.67                   | 129.18                    | DC     | 40.13      |
| 42880940 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P1-2: LN 573       | single  | 2738.22    | 127.39                   | 127.48                    | DC     | 47.37      |
| 42880941 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P1-2: LN 594       | single  | 2738.22    | 126.29                   | 126.37                    | DC     | 45.62      |
| 42880728 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P4-2: 557T574      | breaker | 3637.0     | 114.62                   | 114.72                    | DC     | 276.23     |
| 42880863 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P1-2: LN 574       | single  | 2442.12    | 149.15                   | 149.58                    | DC     | 68.55      |
| 42880864 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P1-2: LN 557       | single  | 2442.12    | 138.45                   | 138.86                    | DC     | 68.02      |
| 42880872 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | Base Case              | single  | 2442.12    | 102.44                   | 103.92                    | DC     | 49.95      |
| 42881042 | 314916    | 8MORRSVL    | 500.0 | DVP           | 314913  | 8LOUDOUN    | 500.0 | DVP         | 1       | DVP_P1-2: LN 580       | single  | 2738.22    | 105.77                   | 106.19                    | DC     | 30.2       |
| 42880753 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P4-2: SPOTS H1T594 | breaker | 3938.0     | 103.79                   | 104.12                    | DC     | 123.21     |
| 42880988 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P1-2: LN 573       | single  | 3218.56    | 107.57                   | 108.65                    | DC     | 34.01      |
| 42881020 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314934  | 8SPOTSYL    | 500.0 | DVP         | 1       | DVP_P1-2: LN 581       | single  | 3218.56    | 115.06                   | 115.16                    | DC     | 51.33      |
| 42881021 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314934  | 8SPOTSYL    | 500.0 | DVP         | 1       | DVP_P1-2: LN 575       | single  | 3218.56    | 111.91                   | 112.46                    | DC     | 41.26      |
| 42881058 | 314919    | 8OX         | 500.0 | DVP           | 314904  | 8CLIFTON    | 500.0 | DVP         | 1       | DVP_P1-2: LN 569       | single  | 2442.12    | 103.65                   | 103.7                     | DC     | 27.93      |
| 42880718 | 314924    | 8SURREY     | 500.0 | DVP           | 314903  | 8CHCKAHM    | 500.0 | DVP         | 1       | DVP_P4-2: 56372        | breaker | 3144.0     | 112.37                   | 115.2                     | DC     | 283.93     |

| ID       | FROM BUS# | FROM BUS    | kV    | FROM BUS AREA | TO BUS# | TO BUS       | kV    | TO BUS AREA | CK T ID | CONT NAME         | Type    | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|-------------|-------|---------------|---------|--------------|-------|-------------|---------|-------------------|---------|------------|------------------------|-------------------------|--------|------------|
| 42880719 | 314924    | 8SURRY      | 500.0 | DVP           | 314903  | 8CHCKAHM     | 500.0 | DVP         | 1       | DVP_P4-2: 563T576 | breaker | 3144.0     | 104.46                 | 106.53                  | DC     | 273.42     |
| 42880738 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL     | 500.0 | DVP         | 1       | DVP_P4-2: 568T575 | breaker | 3938.0     | 108.47                 | 108.74                  | DC     | 157.85     |
| 42880739 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL     | 500.0 | DVP         | 1       | DVP_P4-2: 57502   | breaker | 3938.0     | 103.28                 | 103.52                  | DC     | 148.11     |
| 42880953 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL     | 500.0 | DVP         | 1       | DVP_P1-2: LN 575  | single  | 3218.56    | 115.31                 | 116.23                  | DC     | 40.69      |
| 42880954 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL     | 500.0 | DVP         | 1       | DVP_P1-2: LN 552  | single  | 3218.56    | 119.86                 | 119.94                  | DC     | 50.69      |
| 42880855 | 927250    | AC1-221 TAP | 230.0 | DVP           | 304070  | 6PERSON230 T | 230.0 | CPL         | 1       | DVP_P1-2: LN 570  | single  | 718.0      | 122.95                 | 125.09                  | DC     | 15.52      |

## 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    | FROM 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 |
|----------|-----------|-------------|-------|---------------|---------|-------------|-------|-------------|---------|------------------|-----------|------------|------------------------|-------------------------|--------|------------|
| 42880909 | 314902    | 8CARSON     | 500.0 | DVP           | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | DVP_P1-2: LN 557 | operation | 3218.56    | 127.59                 | 132.35                  | DC     | 259.6      |
| 42880917 | 314902    | 8CARSON     | 500.0 | DVP           | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | Base Case        | operation | 3218.56    | 100.47                 | 100.86                  | DC     | 184.16     |
| 42880841 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | DVP_P1-2: LN 563 | operation | 2442.12    | 169.77                 | 171.59                  | DC     | 281.18     |
| 42880848 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | Base Case        | operation | 2442.12    | 139.37                 | 141.08                  | DC     | 226.36     |
| 42880897 | 314905    | 8CHANCE     | 500.0 | DVP           | 314900  | 8BRISTER    | 500.0 | DVP         | 1       | DVP_P1-2: LN 594 | operation | 2442.12    | 144.41                 | 144.47                  | DC     | 168.35     |
| 42881002 | 314908    | 8ELMONT     | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P1-2: LN 576 | operation | 4070.2     | 119.51                 | 119.66                  | DC     | 285.51     |
| 42880921 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P1-2: LN 581 | operation | 2442.12    | 137.67                 | 137.77                  | DC     | 147.35     |
| 42880931 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | Base Case        | operation | 2442.12    | 108.06                 | 108.12                  | DC     | 113.58     |

| 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 PROJEC T LOADIN G % | POST PROJEC T LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|-------------|-------|----------------|---------|-------------|-------|-------------|---------|-------------------|------------|------------|-------------------------|--------------------------|--------|------------|
| 42880938 | 314911    | 8LADYSMIT H | 500.0 | DVP            | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P 1-2: LN 594 | operatio n | 2738.22    | 129.04                  | 129.1                    | DC     | 164.87     |
| 42880861 | 314914    | 8MDLTHAN    | 500.0 | DVP            | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 557 | operatio n | 2442.12    | 145.69                  | 150.81                   | DC     | 245.82     |
| 42880871 | 314914    | 8MDLTHAN    | 500.0 | DVP            | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | Base Case         | operatio n | 2442.12    | 115.52                  | 115.74                   | DC     | 180.51     |
| 42881041 | 314916    | 8MORRSVL    | 500.0 | DVP            | 314913  | 8LOUDOU N   | 500.0 | DVP         | 1       | DVP_P 1-2: LN 580 | operatio n | 2738.22    | 110.82                  | 110.87                   | DC     | 109.16     |
| 42880986 | 314918    | 8NO ANNA    | 500.0 | DVP            | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P 1-2: LN 594 | operatio n | 3218.56    | 119.43                  | 120.22                   | DC     | 116.16     |
| 42881019 | 314918    | 8NO ANNA    | 500.0 | DVP            | 314934  | 8SPOTSYL    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 575 | operatio n | 3218.56    | 116.47                  | 116.8                    | DC     | 149.1      |
| 42881051 | 314923    | 8SEPTA      | 500.0 | DVP            | 314924  | 8SURRY      | 500.0 | DVP         | 1       | DVP_P 1-2: LN 563 | operatio n | 2442.12    | 101.15                  | 103.57                   | DC     | 172.94     |
| 42880873 | 314924    | 8SURRY      | 500.0 | DVP            | 314903  | 8CHCKAH M   | 500.0 | DVP         | 1       | DVP_P 1-2: LN 563 | operatio n | 2442.12    | 132.05                  | 134.72                   | DC     | 268.66     |
| 42880950 | 314934    | 8SPOTSYL    | 500.0 | DVP            | 314916  | 8MORRSVL    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 575 | operatio n | 3218.56    | 125.81                  | 126.17                   | DC     | 147.06     |

## 12.5 System Reinforcements

| ID                                   | Index | Facility                                     | Upgrade Description                                                                                                                                                                                                                                                                                                                                                             | Cost          |
|--------------------------------------|-------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 42880927,42880928, 42880768          | 7     | 8LADYSMITH 500.0 kV - 8POSSUM 500.0 kV Ckt 1 | <p><b>DVP</b><br/> n6063 : Replace wavetraps at Ladysmith and Possum Pt 500 kV substations.<br/> Project Type : FAC<br/> Cost : \$300,000<br/> Time Estimate : 16-18 Months</p> <p>n6157 : Relay Change Outs (CT) at Ladysmith and Possum Pt 500 kV substations.<br/> Project Type : FAC<br/> Cost : \$120,000<br/> Time Estimate : 6-12 Months</p>                             | \$420,000     |
| 42880864,42880728, 42880872,42880863 | 8     | 8MDLTHAN 500.0 kV - 8NO ANNA 500.0 kV Ckt 1  | <p><b>DVP</b><br/> n5609 : Rebuild 41.13 miles of 500 kV Line 576 from Midlothian to North Anna with 3-1351.5 125C ACSR.<br/> Project Type : FAC<br/> Cost : \$127,503,000<br/> Time Estimate : 48-60 Months</p> <p>n6055 : Replace wavetraps at Milothian and North Anna 500kV substations<br/> Project Type : FAC<br/> Cost : \$300,000<br/> Time Estimate : 16-18 Months</p> | \$127,803,000 |

| ID                                                   | Index | Facility                                                 | Upgrade Description                                                                                                                                                                                                          | Cost          |
|------------------------------------------------------|-------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 42880723,42880724,<br>42880910,42880913              | 1     | 8CARSON 500.0 kV -<br>8MDLTHAN 500.0 kV Ckt<br>1         | <u>DVP</u><br>n6172 : Rebuild 37.41 miles of 500 kV Line 563 from Carson to Midlothian with 3-1351.5 125C ACSR.<br>Project Type : FAC<br>Cost : \$115,971,000<br>Time Estimate : 48-60 Months                                | \$115,971,000 |
| 42880775,42881021,<br>42881020                       | 2     | 8NO ANNA 500.0 kV -<br>8SPOTSYL 500.0 kV Ckt 1           | <u>DVP</u><br>n6132 : Rebuild 14.02 miles of 500 kV Line 573 from North Anna to Spotsylvania with 3-1351.5 113C ACSR.<br>Project Type : FAC<br>Cost : \$43,462,000<br>Time Estimate : 48-60 Months                           | \$43,462,000  |
| 42880940,42880733,<br>42880734,42880941              | 6     | 8LADYSMITH 500.0 kV -<br>8CHANCE 500.0 kV Ckt 1          | <u>DVP</u><br>b3021 : PJM baseline upgrade b3021: Rebuild 500kV Line #581 Ladysmith to Chancellor - 15.2 miles long. The baseline project has a projected in-service date of 12/31/2023.<br>Project Type : FAC<br>Cost : \$0 | \$0           |
| 42880843,42880714,<br>42880713,42880844,<br>42880852 | 3     | 8CHCKAHM 500.0 kV -<br>8ELMONT 500.0 kV Ckt 1            | <u>DVP</u><br>n6207 : Rebuild 27.72 miles of 500 kV Line 557 from Chickahominy to Elmont with 3-1351.5 113C ACSR.<br>Project Type : FAC<br>Cost : \$85,932,000<br>Time Estimate : 48-60 Months                               | \$85,932,000  |
| 42881058                                             | 11    | 8OX 500.0 kV - 8CLIFTON<br>500.0 kV Ckt 1                | <u>DVP</u><br>n6161 : Replace wavetraps at Ox and Clifton 500 kV substations.<br>Project Type : FAC<br>Cost : \$300,000<br>Time Estimate : 16-18 Months                                                                      | \$300,000     |
| 42880855                                             | 14    | AC1-221 TAP 230.0 kV -<br>6PERSON230 T 230.0 kV<br>Ckt 1 | <u>DVP</u><br>dom-006 : For DEV portion, rebuild 2 miles of 230 kV Line 296 from AC1-221 Tap to Persons (Duke Energy/Progress) with 2-636 ACSR.<br>Project Type : FAC<br>Cost : \$3,000,000<br>Time Estimate : 30-36 Months  | \$3,000,000   |
| 42880738,42880739,<br>42880953,42880954              | 13    | 8SPOTSYL 500.0 kV -<br>8MORRSVL 500.0 kV Ckt<br>1        | <u>DVP</u><br>n6160 : Rebuild 18.75 miles of 500 kV Line 594 from Spotsylvania to Morrisville with 3-1351.5 113C ACSR.<br>Project Type : FAC<br>Cost : \$58,125,000<br>Time Estimate : 48-60 Months                          | \$58,125,000  |

| ID                                      | Index | Facility                                            | Upgrade Description                                                                                                                                                                                                                                                                                                                                                                                                   | Cost          |
|-----------------------------------------|-------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 42880718,42880719                       | 12    | 8SURRY 500.0 kV -<br>8CHCKAHM 500.0 kV Ckt<br>1     | <u>DVP</u><br>dom-040 : Replace terminal equipment at Surry and<br>Chickahominy substations<br>Project Type : FAC<br>Cost : \$4,000,000<br>Time Estimate : 16-18 Months                                                                                                                                                                                                                                               | \$4,000,000   |
| 42881003                                | 5     | 8ELMONT 500.0 kV -<br>8LADYSMITH 500.0 kV<br>Ckt 1  | <u>DVP</u><br>b3020 : PJM baseline upgrade b3020: Rebuild 500kV Line<br>#574 Ladysmith to Elmont - 26.2 miles long. The baseline<br>project has a projected in-service date of 12/31/2022.<br>Project Type : FAC<br>Cost : \$0<br><br>dom-183 : Build a new 110 mile, 500 kV Line from Rawlings<br>substation to Morrisville substation<br>Project Type : CON<br>Cost : \$400,000,000<br>Time Estimate : 60-72 Months | \$400,000,000 |
| 42880898,42880749,<br>42880748,42880900 | 4     | 8CHANCE 500.0 kV -<br>8BRISTER 500.0 kV Ckt 1       | <u>DVP</u><br>b3019 : PJM baseline upgrade b3019: Rebuild 500kV Line<br>#552 Bristers to Chancellor 21.6 miles long. The baseline<br>project has a projected in-service date of 12/31/2023.<br>Project Type : FAC<br>Cost : \$0                                                                                                                                                                                       | \$0           |
| 42880753,42880988                       | 10    | 8NO ANNA 500.0 kV -<br>8LADYSMITH 500.0 kV<br>Ckt 1 | <u>DVP</u><br>dom-044 : Rebuild 14.53 miles of 500 kV Line 575 from North<br>Anna to Ladysmith with 3-1351.5 113C ACSR.<br>Project Type : FAC<br>Cost : \$45,043,000<br>Time Estimate : 48-60 Months                                                                                                                                                                                                                  | \$45,043,000  |
| 42881042                                | 9     | 8MORRSLV 500.0 kV -<br>8LOUDOUN 500.0 kV Ckt<br>1   | <u>DVP</u><br>dom-181 : Rebuild 8.1 miles of 500 kV Line 569 from<br>Morrisville to Loudoun with 1351.5 ACSR. Replace Wave<br>Trap, CT, and Relay at Loudoun. Replace wavetrap at<br>Morrisville.<br>Project Type : FAC<br>Cost : \$25,830,000<br>Time Estimate : 42-48 Months                                                                                                                                        | \$25,830,000  |
|                                         |       |                                                     | TOTAL COST                                                                                                                                                                                                                                                                                                                                                                                                            | \$909,886,000 |

## 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 563</b>  | CONTINGENCY 'DVP_P1-2: LN 563'<br>OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN<br>500.00<br>END                                                                                                                                                                                                   |
| <b>DVP_P1-2: LN 569</b>  | CONTINGENCY 'DVP_P1-2: LN 569'<br>OPEN BRANCH FROM BUS 314913 TO BUS 314916 CKT 1 /* 8LOUDOUN 500.00 - 8MORRSVL<br>500.00<br>END                                                                                                                                                                                                  |
| <b>DVP_P4-2: 568T575</b> | CONTINGENCY 'DVP_P4-2: 568T575' /* LADYSMITH 500 KV<br>OPEN BRANCH FROM BUS 314911 TO BUS 314922 CKT 1 /* 8LADYSMITH 500.00 - 8POSSUM<br>500.00<br>OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA<br>500.00<br>END                                                                               |
| <b>DVP_P4-2: 545T552</b> | CONTINGENCY 'DVP_P4-2: 545T552' /* BRISTERS 500 KV<br>OPEN BRANCH FROM BUS 314900 TO BUS 314916 CKT 1 /* 8BRISTER 500.00 - 8MORRSVL<br>500.00<br>OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 1 /* 3CHANCE 115.00 - 8CHANCE 500.00<br>OPEN BRANCH FROM BUS 314900 TO BUS 314905 CKT 1 /* 8BRISTER 500.00 - 8CHANCE 500.00<br>END |
| <b>DVP_P4-2: 57502</b>   | CONTINGENCY 'DVP_P4-2: 57502' /* NORTH ANNA 500 KV<br>OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA<br>500.00<br>OPEN BRANCH FROM BUS 314232 TO BUS 314918 CKT 1 /* 6NO ANNA 230.00 - 8NO ANNA<br>500.00<br>END                                                                                 |

| Contingency Name  | Contingency Definition                                                                                                                                                                                                                              |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DVP_P1-2: LN 594  | CONTINGENCY 'DVP_P1-2: LN 594'<br>OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL<br>500.00<br>END                                                                                                                    |
| DVP_P4-2: 56372   | CONTINGENCY 'DVP_P4-2: 56372' /* CARSON 500 KV<br>OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN<br>500.00<br>OPEN BRANCH FROM BUS 314282 TO BUS 314902 CKT 1 /* 6CARSON 230.00 - 8CARSON 500.00<br>END               |
| DVP_P1-2: LN 552  | CONTINGENCY 'DVP_P1-2: LN 552'<br>OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 1 /* 3CHANCE 115.00 - 8CHANCE 500.00<br>OPEN BRANCH FROM BUS 314900 TO BUS 314905 CKT 1 /* 8BRISTER 500.00 - 8CHANCE 500.00<br>END                                  |
| DVP_P4-2: 573T594 | CONTINGENCY 'DVP_P4-2: 573T594' /* SPOTSYLVANIA 500 KV<br>OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL<br>500.00<br>OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL<br>500.00<br>END |
| DVP_P1-2: LN 557  | CONTINGENCY 'DVP_P1-2: LN 557'<br>OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM<br>500.00<br>OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT<br>500.00<br>END                          |
| DVP_P1-2: LN 570  | CONTINGENCY 'DVP_P1-2: LN 570'<br>OPEN BRANCH FROM BUS 304183 TO BUS 314935 CKT 1 /* 8WAKE 500 TT500.00 - 8HERITAGE<br>500.00<br>END                                                                                                                |
| DVP_P1-2: LN 573  | CONTINGENCY 'DVP_P1-2: LN 573'<br>OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL<br>500.00<br>END                                                                                                                    |
| DVP_P1-2: LN 575  | CONTINGENCY 'DVP_P1-2: LN 575'<br>OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA<br>500.00<br>END                                                                                                                  |

| Contingency Name  | Contingency Definition                                                                                                                                                                                                                                                                                                                   |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DVP_P1-2: LN 574  | CONTINGENCY 'DVP_P1-2: LN 574'<br>OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH<br>500.00<br>END                                                                                                                                                                                                        |
| DVP_P1-2: LN 576  | CONTINGENCY 'DVP_P1-2: LN 576'<br>OPEN BRANCH FROM BUS 314914 TO BUS 314918 CKT 1 /* 8MDLTHAN 500.00 - 8NO ANNA<br>500.00<br>END                                                                                                                                                                                                         |
| DVP_P4-2: 557T574 | CONTINGENCY 'DVP_P4-2: 557T574' /* ELMONT 500 KV<br>OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM<br>500.00<br>OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT<br>500.00<br>OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH<br>500.00<br>END |
| Base Case         |                                                                                                                                                                                                                                                                                                                                          |
| DVP_P4-2: 563T576 | CONTINGENCY 'DVP_P4-2: 563T576' /* MIDLOTHIAN 500 500 KV<br>OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN<br>500.00<br>OPEN BRANCH FROM BUS 314914 TO BUS 314918 CKT 1 /* 8MDLTHAN 500.00 - 8NO ANNA<br>500.00<br>END                                                                                     |
| DVP_P4-2: H2T557  | CONTINGENCY 'DVP_P4-2: H2T557' /* ELMONT 500 KV<br>OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM<br>500.00<br>OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT<br>500.00<br>OPEN BRANCH FROM BUS 314218 TO BUS 314908 CKT 2 /* 6ELMONT 230.00 - 8ELMONT 500.00<br>END        |
| DVP_P1-2: LN 580  | CONTINGENCY 'DVP_P1-2: LN 580'<br>OPEN BRANCH FROM BUS 235110 TO BUS 314929 CKT 1 /* 01MDWBRK 500.00 - 8FRONT<br>ROYAL500.00<br>END                                                                                                                                                                                                      |
| DVP_P1-2: LN 581  | CONTINGENCY 'DVP_P1-2: LN 581'<br>OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 2 /* 3CHANCE 115.00 - 8CHANCE 500.00<br>OPEN BRANCH FROM BUS 314905 TO BUS 314911 CKT 1 /* 8CHANCE 500.00 - 8LADYSMITH<br>500.00<br>END                                                                                                                  |

| Contingency Name              | Contingency Definition                                                                                                                                                                                                                                                               |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DVP_P4-2: H1T594</b>       | CONTINGENCY 'DVP_P4-2: H1T594' /* MORRISVILLE 500 KV<br>OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00<br>OPEN BRANCH FROM BUS 314063 TO BUS 314916 CKT 1 /* 6MORRSVL 230.00 - 8MORRSVL 500.00<br>OPEN BUS 314897 /* 8MORRS_1 500.00 KV<br>END |
| <b>DVP_P4-2: SPOTS H1T594</b> | CONTINGENCY 'DVP_P4-2: SPOTS H1T594' /* SPOTSYLVANIA 500 KV<br>OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00<br>OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1 /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00<br>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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880910 | 314902    | 8CARSON  | DVP           | 314914  | 8MDLTHAN | DVP         | 1      | DVP_P1-2: LN 557 | single | 3218.56    | 119.49                | 120.01                 | DC    | 71.83     |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 314295 | 6BIRDNECK                          | 0.0599    |
| 314491 | 3PENDLTN                           | 0.4472    |
| 314643 | 3O INLET                           | 0.5955    |
| 314947 | 8GREENSVILLE                       | 79.5572   |
| 315090 | 1YORKTN1 (Deactivation : 09/09/18) | 20.0676   |
| 315091 | 1YORKTN2 (Deactivation : 09/09/18) | 20.8249   |
| 315099 | 1CHESPKB (Deactivation : 05/31/19) | 4.5038    |
| 315102 | 1BRUNSWICKG1                       | 13.0197   |
| 315103 | 1BRUNSWICKG2                       | 13.0197   |
| 315104 | 1BRUNSWICKG3                       | 13.0197   |
| 315105 | 1BRUNSWICKS1                       | 27.0483   |
| 315108 | 1ELIZAR1                           | 4.3626    |
| 315109 | 1ELIZAR2                           | 4.2868    |
| 315110 | 1ELIZAR3                           | 4.4184    |
| 315233 | 1SURRY 2                           | 34.5162   |
| 315294 | 1DOMTR10                           | 13.8163   |
| 315603 | 6AA1-139SOLA                       | 3.3481    |
| 923262 | AB1-132 C OP                       | 16.6933   |
| 923263 | AB1-132 E OP                       | 7.1543    |
| 923801 | AB2-015 C OP                       | 10.8562   |
| 923831 | AB2-022 C                          | 3.1065    |
| 924241 | AB2-068 OP                         | 310.6012  |
| 924501 | AB2-099 C                          | 0.7281    |
| 924511 | AB2-100 C                          | 13.4345   |
| 925061 | AB2-161 C O1                       | 3.7736    |
| 925121 | AB2-169 C                          | 8.1128    |
| 926071 | AC1-086 C                          | 24.5829   |
| 926201 | AC1-098 C                          | 7.3860    |
| 926211 | AC1-099 C                          | 2.4751    |
| 926291 | AC1-107 O1                         | 468.8320  |
| 926661 | AC1-147 C                          | 3.0437    |
| 926751 | AC1-161 C O1                       | 52.0629   |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 932041       | AC2-012 C    | 13.7690          |
| 932591       | AC2-079 C O1 | 6.8459           |
| 932631       | AC2-084 C    | 10.5289          |
| 933291       | AC2-141 C    | 52.0629          |
| 933731       | AC2-196 C    | 2.8836           |
| 933991       | AD1-023 C    | 16.7926          |
| 934061       | AD1-033 C    | 12.0989          |
| 934521       | AD1-076 C    | 69.8961          |
| 934571       | AD1-082 C    | 8.5999           |
| 934611       | AD1-087 C O1 | 10.1500          |
| 935111       | AD1-144 C    | 2.2048           |
| 935171       | AD1-152 C O1 | 10.0870          |
| 936401       | AD2-051 C O1 | 11.0366          |
| 936661       | AD2-085 C    | 4.0955           |
| 936711       | AD2-090 C O1 | 8.9668           |
| 937221       | AD2-160 C O1 | 9.3926           |
| 937251       | AD2-164      | 5.2902           |
| 937481       | AD2-202 C O1 | 2.6899           |
| 937541       | AD2-215 C    | 2.2275           |
| 938171       | AE1-026 C O1 | 40.8412          |
| 938181       | AE1-027 C    | 3.7681           |
| 938191       | AE1-028 C    | 2.1861           |
| 938221       | AE1-035 C    | 2.8269           |
| 938491       | AE1-068 C O1 | 113.9686         |
| 938501       | AE1-069 C O1 | 88.9910          |
| 938531       | AE1-072 C O1 | 28.0724          |
| 938661       | AE1-088      | 4.1604           |
| 938771       | AE1-103 C O1 | 4.5935           |
| 939311       | AE1-162 C    | 2.5027           |
| 939411       | AE1-173 C    | 166.5312         |
| 940061       | AE2-000BC O1 | 17.8750          |
| 940251       | AE2-007 O1   | 276.2498         |
| 940471       | AE2-031 C    | 62.1441          |
| 940481       | AE2-033 C    | 18.1590          |
| 940491       | AE2-034 C    | 5.7859           |
| 940521       | AE2-037 C    | 10.0905          |
| 940541       | AE2-040 O1   | 1.9129           |
| 940641       | AE2-051 C O1 | 32.9391          |
| 941031       | AE2-094 C    | 74.9277          |
| 941101       | AE2-104 C O1 | 4.5191           |

| Bus #   | Bus                                   | MW Impact |
|---------|---------------------------------------|-----------|
| 941281  | AE2-122 C O1                          | 45.5169   |
| 941291  | AE2-123 C O1                          | 46.7773   |
| 941301  | AE2-124 C O1                          | 42.5705   |
| 941501  | AE2-147 C                             | 21.1691   |
| 941541  | AE2-151 C                             | 1.3508    |
| 941591  | AE2-156 O1                            | 28.4750   |
| 942131  | AE2-225 C                             | 2.8590    |
| 942171  | AE2-229 C                             | 2.8590    |
| 942341  | AE2-247 C                             | 0.9397    |
| 942401  | AE2-253 C                             | 9.8794    |
| 942471  | AE2-260 C O1                          | 16.6016   |
| 942851  | AE2-304 C                             | 0.8395    |
| 942931  | AE2-313 C                             | 67.2871   |
| 943171  | AE2-346 C                             | 0.9261    |
| 943451  | AF1-016 C O1                          | 0.9386    |
| 943461  | AF1-017 C                             | 0.8502    |
| 943611  | AF1-032 C                             | 1.2375    |
| 944011  | AF1-069 C                             | 24.4817   |
| 944051  | AF1-073 C O1                          | 13.8615   |
| 944581  | AF1-123 C O1                          | 71.8325   |
| 944591  | AF1-124 C O1                          | 71.8325   |
| 944601  | AF1-125 C O1                          | 71.8325   |
| 944871  | AF1-152 C                             | 3.7399    |
| 945711  | AF1-236 C O1                          | 54.2934   |
| 945811  | AF1-246 C O1                          | 12.3463   |
| 946011  | AF1-266                               | 8.0563    |
| 946461  | AF1-310 C O1 (Withdrawn : 11/05/2019) | 13.7483   |
| LGEE    | LGEE                                  | 1.8958    |
| CPLE    | CPLE                                  | 12.0393   |
| WEC     | WEC                                   | 0.9900    |
| CBM-W2  | CBM-W2                                | 42.9729   |
| NY      | NY                                    | 2.1772    |
| CBM-W1  | CBM-W1                                | 36.2290   |
| TVA     | TVA                                   | 9.3254    |
| CBM-S2  | CBM-S2                                | 81.6656   |
| CBM-S1  | CBM-S1                                | 51.4693   |
| MADISON | MADISON                               | 2.8627    |
| MEC     | MEC                                   | 6.2384    |
| AA2-074 | AA2-074                               | 8.2031    |

### 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881020 | 314918    | 8NO ANNA | DVP           | 314934  | 8SPOTSYL | DVP         | 1      | DVP_P1-2: LN 581 | single | 3218.56    | 115.06                | 115.16                 | DC    | 51.33     |

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

### 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 |
|----------|-----------|----------|---------------|---------|---------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880843 | 314903    | 8CHCKAHM | DVP           | 314908  | 8ELMONT | DVP         | 1      | DVP_P1-2: LN 563 | single | 2442.12    | 162.22                | 163.17                 | DC    | 77.8      |

| Bus #  | Bus                               | MW Impact |
|--------|-----------------------------------|-----------|
| 314295 | 6BIRDNECK                         | 0.0656    |
| 314421 | 6WINCHST                          | 0.2002    |
| 314491 | 3PENDLTN                          | 0.4894    |
| 314507 | 3THOMPSN                          | 0.4919    |
| 315090 | 1YORKTN1 (Deativation : 09/09/18) | 51.3268   |
| 315091 | 1YORKTN2 (Deativation : 09/09/18) | 53.2636   |
| 315092 | 1YORKTN3                          | 35.6504   |
| 315098 | 1CHESPKA                          | 0.6505    |
| 315099 | 1CHESPKB (Deativation : 05/31/19) | 4.9568    |
| 315108 | 1ELIZAR1                          | 4.7917    |
| 315109 | 1ELIZAR2                          | 4.7085    |
| 315110 | 1ELIZAR3                          | 4.8530    |
| 315233 | 1SURRY 2                          | 43.4137   |
| 315260 | 1GOSPORTA                         | 0.5193    |
| 315261 | 1GOSPORTB                         | 0.6633    |
| 315262 | 1GOSPORTC                         | 0.5629    |
| 315294 | 1DOMTR10                          | 13.7122   |
| 315603 | 6AA1-139SOLA                      | 3.6271    |
| 923801 | AB2-015 C OP                      | 11.1677   |
| 923831 | AB2-022 C                         | 3.3405    |
| 924241 | AB2-068 OP                        | 610.0300  |
| 924501 | AB2-099 C                         | 0.7110    |
| 925061 | AB2-161 C O1                      | 4.1633    |
| 925121 | AB2-169 C                         | 7.8887    |
| 925331 | AB2-190 C                         | 23.1774   |
| 925861 | AC1-065 C                         | 4.3075    |
| 926291 | AC1-107 O1                        | 920.8000  |
| 926661 | AC1-147 C                         | 3.9410    |
| 926751 | AC1-161 C O1                      | 57.4840   |
| 926781 | AC1-164 C                         | 54.7782   |
| 927221 | AC1-216 C O1                      | 11.5099   |
| 932041 | AC2-012 C                         | 17.8285   |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 932581       | AC2-078 C O1 | 4.3589           |
| 932591       | AC2-079 C O1 | 7.4840           |
| 932831       | AC2-110 C    | 1.7230           |
| 933261       | AC2-137 C    | 2.2718           |
| 933291       | AC2-141 C    | 57.4840          |
| 933731       | AC2-196 C    | 3.1380           |
| 933991       | AD1-023 C    | 16.8501          |
| 934011       | AD1-025 C    | 19.7853          |
| 934061       | AD1-033 C    | 13.1754          |
| 934141       | AD1-041 C    | 6.8184           |
| 934521       | AD1-076 C    | 70.5967          |
| 934571       | AD1-082 C    | 9.4880           |
| 935111       | AD1-144 C    | 2.4908           |
| 935161       | AD1-151 C O1 | 18.6247          |
| 936041       | AD2-007 C    | 0.9452           |
| 936051       | AD2-008 C    | 3.4446           |
| 936151       | AD2-021      | 0.2591           |
| 936301       | AD2-039 C    | 1.7230           |
| 936401       | AD2-051 C O1 | 10.8437          |
| 936591       | AD2-074 C    | 4.5519           |
| 936661       | AD2-085 C    | 4.4790           |
| 936711       | AD2-090 C O1 | 9.0735           |
| 937221       | AD2-160 C O1 | 10.1887          |
| 937251       | AD2-164      | 8.5056           |
| 937541       | AD2-215 C    | 2.5165           |
| 938031       | AE1-004 C    | 1.7230           |
| 938171       | AE1-026 C O1 | 40.8251          |
| 938181       | AE1-027 C    | 4.0958           |
| 938191       | AE1-028 C    | 2.3762           |
| 938221       | AE1-035 C    | 2.7820           |
| 938491       | AE1-068 C O1 | 70.4586          |
| 938501       | AE1-069 C O1 | 55.0720          |
| 938531       | AE1-072 C O1 | 30.3688          |
| 938631       | AE1-085 C O1 | 9.7610           |
| 938661       | AE1-088      | 4.0455           |
| 938771       | AE1-103 C O1 | 4.7592           |
| 939191       | AE1-149 C O1 | 11.1675          |
| 939311       | AE1-162 C    | 2.9813           |
| 939411       | AE1-173 C    | 119.7929         |
| 939421       | AE1-174 C    | 0.6369           |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 939431       | AE1-175 C    | 4.2354           |
| 939611       | AE1-191 C    | 13.6369          |
| 940061       | AE2-000BC O1 | 19.7209          |
| 940231       | AE2-005 C    | 1.7230           |
| 940251       | AE2-007 O1   | 303.5071         |
| 940471       | AE2-031 C    | 38.4037          |
| 940481       | AE2-033 C    | 16.4675          |
| 940491       | AE2-034 C    | 5.9425           |
| 940521       | AE2-037 C    | 9.8668           |
| 940541       | AE2-040 O1   | 1.7331           |
| 940551       | AE2-041 O1   | 9.3996           |
| 940641       | AE2-051 C O1 | 21.9165          |
| 940651       | AE2-052      | 1.9729           |
| 940891       | AE2-078 C    | 3.1998           |
| 940901       | AE2-079 C    | 3.1998           |
| 940911       | AE2-080 C    | 3.1998           |
| 941031       | AE2-094 C    | 46.2403          |
| 941101       | AE2-104 C O1 | 4.8887           |
| 941281       | AE2-122 C O1 | 49.7643          |
| 941291       | AE2-123 C O1 | 51.1423          |
| 941301       | AE2-124 C O1 | 46.5117          |
| 941501       | AE2-147 C    | 22.6211          |
| 941541       | AE2-151 C    | 1.3151           |
| 941591       | AE2-156 O1   | 31.3210          |
| 941601       | AE2-157 C    | 12.4792          |
| 942131       | AE2-225 C    | 3.1017           |
| 942171       | AE2-229 C    | 3.1017           |
| 942341       | AE2-247 C    | 1.0279           |
| 942401       | AE2-253 C    | 10.7167          |
| 942551       | AE2-270      | 31.0411          |
| 942851       | AE2-304 C    | 0.8909           |
| 942931       | AE2-313 C    | 41.5820          |
| 943171       | AE2-346 C    | 0.9044           |
| 943431       | AF1-014 C    | 0.8651           |
| 943451       | AF1-016 C O1 | 1.0154           |
| 943461       | AF1-017 C    | 0.9300           |
| 943471       | AF1-018      | 4.9818           |
| 943611       | AF1-032 C    | 1.3425           |
| 943621       | AF1-033 C    | 1.6959           |
| 943741       | AF1-042 C    | 1.6671           |

| <b>Bus #</b>   | <b>Bus</b>   | <b>MW Impact</b> |
|----------------|--------------|------------------|
| <b>944011</b>  | AF1-069 C    | 8.0075           |
| <b>944051</b>  | AF1-073 C O1 | 14.0005          |
| <b>944061</b>  | AF1-074 C O1 | 4.4008           |
| <b>944501</b>  | AF1-115 C O1 | 5.1648           |
| <b>944581</b>  | AF1-123 C O1 | 77.8031          |
| <b>944591</b>  | AF1-124 C O1 | 77.8031          |
| <b>944601</b>  | AF1-125 C O1 | 77.8031          |
| <b>944871</b>  | AF1-152 C    | 3.9964           |
| <b>945361</b>  | AF1-201 C O1 | 12.4157          |
| <b>945711</b>  | AF1-236 C O1 | 55.7621          |
| <b>945811</b>  | AF1-246 C O1 | 4.1299           |
| <b>946011</b>  | AF1-266      | 7.3058           |
| <b>LGEE</b>    | LGEE         | 1.0440           |
| <b>CPL</b>     | CPL          | 9.3318           |
| <b>WEC</b>     | WEC          | 0.5399           |
| <b>CBM-W2</b>  | CBM-W2       | 27.6658          |
| <b>NY</b>      | NY           | 1.8183           |
| <b>CBM-W1</b>  | CBM-W1       | 19.1653          |
| <b>TVA</b>     | TVA          | 6.2832           |
| <b>CBM-S2</b>  | CBM-S2       | 61.3085          |
| <b>CBM-S1</b>  | CBM-S1       | 34.0289          |
| <b>MADISON</b> | MADISON      | 2.2942           |
| <b>MEC</b>     | MEC          | 3.7055           |
| <b>AA2-074</b> | AA2-074      | 6.3540           |

## 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880898 | 314905    | 8CHANCE  | DVP           | 314900  | 8BRISTER | DVP         | 1      | DVP_P1-2: LN 594 | single | 2442.12    | 141.15                | 141.24                 | DC    | 46.58     |

| 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 (Deativation : 12/13/18) | 16.9907   |
| 315059 | 1CHESTF4 (Deativation : 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 (Deativation : 06/25/19) | 7.7801    |
| 315075 | 1HOPCGN2 (Deativation : 06/25/19) | 7.6793    |
| 315083 | 1SPRUNCA (Deativation : 01/12/19) | 9.8906    |
| 315084 | 1SPRUNCB (Deativation : 01/12/19) | 9.8906    |
| 315090 | 1YORKTN1 (Deativation : 09/09/18) | 26.3583   |
| 315091 | 1YORKTN2 (Deativation : 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> |
|----------------|--------------|------------------|
| <b>942131</b>  | AE2-225 C    | 1.9240           |
| <b>942151</b>  | AE2-227 C    | 2.0543           |
| <b>942161</b>  | AE2-228 C    | 2.0129           |
| <b>942171</b>  | AE2-229 C    | 1.9240           |
| <b>942191</b>  | AE2-231 C O1 | 6.3933           |
| <b>942341</b>  | AE2-247 C    | 0.7153           |
| <b>942371</b>  | AE2-250 C O1 | 8.9712           |
| <b>942401</b>  | AE2-253 C    | 5.5577           |
| <b>942551</b>  | AE2-270      | 24.9581          |
| <b>942851</b>  | AE2-304 C    | 0.5607           |
| <b>942931</b>  | AE2-313 C    | 29.0718          |
| <b>943431</b>  | AF1-014 C    | 0.6269           |
| <b>943451</b>  | AF1-016 C O1 | 0.6525           |
| <b>943461</b>  | AF1-017 C    | 0.6472           |
| <b>943471</b>  | AF1-018      | 3.4984           |
| <b>943611</b>  | AF1-032 C    | 0.8328           |
| <b>943621</b>  | AF1-033 C    | 1.1537           |
| <b>944011</b>  | AF1-069 C    | 5.5679           |
| <b>944061</b>  | AF1-074 C O1 | 3.5158           |
| <b>944501</b>  | AF1-115 C O1 | 3.5135           |
| <b>944581</b>  | AF1-123 C O1 | 20.9861          |
| <b>944591</b>  | AF1-124 C O1 | 20.9861          |
| <b>944601</b>  | AF1-125 C O1 | 20.9861          |
| <b>944631</b>  | AF1-128 O1   | 27.6876          |
| <b>944641</b>  | AF1-129 O1   | 51.3335          |
| <b>944871</b>  | AF1-152 C    | 2.4997           |
| <b>945361</b>  | AF1-201 C O1 | 7.8605           |
| <b>946001</b>  | AF1-265      | 31.4250          |
| <b>946011</b>  | AF1-266      | 6.0795           |
| <b>946261</b>  | AF1-291 C    | 1.0669           |
| <b>LGEE</b>    | LGEE         | 1.2933           |
| <b>CPL</b>     | CPL          | 7.4293           |
| <b>WEC</b>     | WEC          | 0.6398           |
| <b>CBM-W2</b>  | CBM-W2       | 28.5913          |
| <b>NY</b>      | NY           | 2.5703           |
| <b>CBM-W1</b>  | CBM-W1       | 22.5931          |
| <b>TVA</b>     | TVA          | 6.3112           |
| <b>CBM-S2</b>  | CBM-S2       | 51.8235          |
| <b>CBM-S1</b>  | CBM-S1       | 34.8553          |
| <b>MADISON</b> | 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           |

## 12.6.6 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 |
|----------|-----------|----------|---------------|---------|------------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881003 | 314908    | 8ELMONT  | DVP           | 314911  | 8LADYSMITH | DVP         | 1      | DVP_P1-2: LN 576 | single | 4070.2     | 114.84                | 115.01                 | DC    | 79.0      |

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

## 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 |
|----------|-----------|------------|---------------|---------|---------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880940 | 314911    | 8LADYSMITH | DVP           | 314905  | 8CHANCE | DVP         | 1      | DVP_P1-2: LN 573 | single | 2738.22    | 127.39                | 127.48                 | DC    | 47.37     |

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

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

## 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 |
|----------|-----------|------------|---------------|---------|---------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880928 | 314911    | 8LADYSMITH | DVP           | 314922  | 8POSSUM | DVP         | 1      | DVP_P1-2: LN 594 | single | 2442.12    | 128.67                | 129.18                 | DC    | 40.13     |

| 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 (Deativation : 12/13/18) | 14.4610   |
| 315059 | 1CHESTF4 (Deativation : 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 (Deativation : 06/25/19) | 6.6486    |
| 315075 | 1HOPCGN2 (Deativation : 06/25/19) | 6.5625    |
| 315083 | 1SPRUNCA (Deativation : 01/12/19) | 9.9482    |
| 315084 | 1SPRUNCB (Deativation : 01/12/19) | 9.9482    |
| 315090 | 1YORKTN1 (Deativation : 09/09/18) | 22.5417   |
| 315091 | 1YORKTN2 (Deativation : 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> |
|----------------|--------------|------------------|
| <b>942191</b>  | AE2-231 C O1 | 5.1480           |
| <b>942341</b>  | AE2-247 C    | 0.6165           |
| <b>942371</b>  | AE2-250 C O1 | 7.6809           |
| <b>942401</b>  | AE2-253 C    | 4.7923           |
| <b>942551</b>  | AE2-270      | 21.3703          |
| <b>942851</b>  | AE2-304 C    | 0.4853           |
| <b>942931</b>  | AE2-313 C    | 25.2749          |
| <b>943431</b>  | AF1-014 C    | 0.5238           |
| <b>943451</b>  | AF1-016 C O1 | 0.5631           |
| <b>943461</b>  | AF1-017 C    | 0.5578           |
| <b>943471</b>  | AF1-018      | 2.9290           |
| <b>943611</b>  | AF1-032 C    | 0.7183           |
| <b>943621</b>  | AF1-033 C    | 0.9893           |
| <b>944011</b>  | AF1-069 C    | 4.8362           |
| <b>944061</b>  | AF1-074 C O1 | 3.0236           |
| <b>944501</b>  | AF1-115 C O1 | 3.0130           |
| <b>944581</b>  | AF1-123 C O1 | 18.0802          |
| <b>944591</b>  | AF1-124 C O1 | 18.0802          |
| <b>944601</b>  | AF1-125 C O1 | 18.0802          |
| <b>944631</b>  | AF1-128 O1   | 23.5855          |
| <b>944641</b>  | AF1-129 O1   | 43.7281          |
| <b>944871</b>  | AF1-152 C    | 2.1613           |
| <b>945361</b>  | AF1-201 C O1 | 6.6615           |
| <b>946001</b>  | AF1-265      | 26.2740          |
| <b>946011</b>  | AF1-266      | 5.2703           |
| <b>946261</b>  | AF1-291 C    | 0.9127           |
| <b>LGEE</b>    | LGEE         | 1.8878           |
| <b>CPL</b>     | CPL          | 6.8961           |
| <b>WEC</b>     | WEC          | 0.9759           |
| <b>CBM-W2</b>  | CBM-W2       | 35.1105          |
| <b>NY</b>      | NY           | 2.7130           |
| <b>CBM-W1</b>  | CBM-W1       | 36.2039          |
| <b>TVA</b>     | TVA          | 7.1638           |
| <b>CBM-S2</b>  | CBM-S2       | 50.0317          |
| <b>CBM-S1</b>  | CBM-S1       | 40.7341          |
| <b>MADISON</b> | MADISON      | 1.4818           |
| <b>MEC</b>     | MEC          | 5.6330           |
| <b>AA2-074</b> | AA2-074      | 4.7061           |

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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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880863 | 314914    | 8MDLTHAN | DVP           | 314918  | 8NO ANNA | DVP         | 1      | DVP_P1-2: LN 574 | single | 2442.12    | 149.15                | 149.58                 | DC    | 68.55     |

| 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          |

| Bus #   | Bus                                   | MW Impact |
|---------|---------------------------------------|-----------|
| 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    |

| 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881042 | 314916    | 8MORRSVL | DVP           | 314913  | 8LOUDOUN | DVP         | 1      | DVP_P1-2: LN 580 | single | 2738.22    | 105.77                | 106.19                 | DC    | 30.2      |

| 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> |
|---------------|--------------|------------------|
| <b>924241</b> | AB2-068 OP   | 114.5712         |
| <b>925021</b> | AB2-158 C    | 10.8013          |
| <b>925051</b> | AB2-160 C O1 | 3.2427           |
| <b>925061</b> | AB2-161 C O1 | 1.9850           |
| <b>925331</b> | AB2-190 C    | 11.9248          |
| <b>925671</b> | AC1-043 C    | 7.9386           |
| <b>925861</b> | AC1-065 C    | 1.9831           |
| <b>926001</b> | AC1-076 C    | 4.9633           |
| <b>926291</b> | AC1-107 O1   | 172.9376         |
| <b>926481</b> | AC1-120 C O1 | 8.1592           |
| <b>926501</b> | AC1-121 C O1 | 2.8021           |
| <b>926611</b> | AC1-143 C O1 | 9.0137           |
| <b>926661</b> | AC1-147 C    | 1.3269           |
| <b>926731</b> | AC1-158 C    | 83.7093          |
| <b>926751</b> | AC1-161 C O1 | 17.9027          |
| <b>926781</b> | AC1-164 C    | 23.6589          |
| <b>927041</b> | AC1-191 C O1 | 5.6533           |
| <b>927221</b> | AC1-216 C O1 | 5.8314           |
| <b>932041</b> | AC2-012 C    | 6.0025           |
| <b>932501</b> | AC2-070 C    | 0.9935           |
| <b>932581</b> | AC2-078 C O1 | 2.4056           |
| <b>932591</b> | AC2-079 C O1 | 3.3594           |
| <b>932781</b> | AC2-102 C    | 6.2861           |
| <b>932831</b> | AC2-110 C    | 0.7932           |
| <b>933011</b> | AC2-125      | 1.6149           |
| <b>933021</b> | AC2-126      | 1.6258           |
| <b>933151</b> | AC2-133 1    | 0.1776           |
| <b>933161</b> | AC2-133 2    | 0.1776           |
| <b>933171</b> | AC2-133 3    | 0.1776           |
| <b>933181</b> | AC2-133 4    | 0.3328           |
| <b>933261</b> | AC2-137 C    | 1.2269           |
| <b>933291</b> | AC2-141 C    | 17.9027          |
| <b>933731</b> | AC2-196 C    | 1.0497           |
| <b>934011</b> | AD1-025 C    | 10.0240          |
| <b>934061</b> | AD1-033 C    | 4.4093           |
| <b>934141</b> | AD1-041 C    | 3.1199           |
| <b>934571</b> | AD1-082 C    | 4.5237           |
| <b>934861</b> | AD1-115 C    | 3.9693           |
| <b>935111</b> | AD1-144 C    | 1.0126           |
| <b>935161</b> | 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> |
|----------------|--------------|------------------|
| <b>945361</b>  | AF1-201 C O1 | 5.0174           |
| <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 |
|----------|-----------|----------|---------------|---------|------------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880988 | 314918    | 8NO ANNA | DVP           | 314911  | 8LADYSMITH | DVP         | 1      | DVP_P1-2: LN 573 | single | 3218.56    | 107.57                | 108.65                 | DC    | 34.01     |

| Bus #  | Bus                                 | MW Impact |
|--------|-------------------------------------|-----------|
| 314295 | 6BIRDNECK                           | 0.0288    |
| 314333 | 6POWHATN                            | 0.3398    |
| 314435 | 6SAPONY                             | 0.2829    |
| 314947 | 8GREENSVILLE                        | 43.3131   |
| 315102 | 1BRUNSWICKG1                        | 7.1073    |
| 315103 | 1BRUNSWICKG2                        | 7.1073    |
| 315104 | 1BRUNSWICKG3                        | 7.1073    |
| 315105 | 1BRUNSWICKS1                        | 14.7654   |
| 315131 | 1EDGECSMA (Deactivation : 04/22/19) | 6.1260    |
| 315132 | 1EDGECSMB (Deactivation : 04/22/19) | 6.1260    |
| 315153 | 1CLOVER1                            | 10.0481   |
| 315154 | 1CLOVER2                            | 9.9480    |
| 315172 | 1LOISA A                            | 2.4389    |
| 315173 | 1LOISA B                            | 2.4515    |
| 315174 | 1LOISA C                            | 2.4515    |
| 315175 | 1LOISA D                            | 2.4515    |
| 315176 | 1LOISA E                            | 4.9979    |
| 315177 | 1S ANNAG1                           | 1.7863    |
| 315178 | 1S ANNAS1                           | 0.9180    |
| 315179 | 1S ANNAG2                           | 1.7863    |
| 315180 | 1S ANNAS2                           | 0.9180    |
| 315225 | 1N ANNA1                            | 91.4291   |
| 315226 | 1N ANNA2                            | 91.4675   |
| 315294 | 1DOMTR10                            | 7.2270    |
| 315603 | 6AA1-139SOLA                        | 1.6132    |
| 922922 | AB1-081 C OP                        | 5.9157    |
| 923262 | AB1-132 C OP                        | 9.5583    |
| 923263 | AB1-132 E OP                        | 4.0964    |
| 923572 | AB1-173 C OP                        | 1.5552    |
| 923582 | AB1-173AC OP                        | 1.5552    |
| 923801 | AB2-015 C OP                        | 5.7044    |
| 923831 | AB2-022 C                           | 1.5122    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 923911       | AB2-031 C O1 | 1.5437           |
| 923991       | AB2-040 C O1 | 5.0688           |
| 924021       | AB2-043 C O1 | 2.1240           |
| 924151       | AB2-059 C OP | 6.9721           |
| 924161       | AB2-060 C OP | 6.1199           |
| 924301       | AB2-077 C O1 | 1.3464           |
| 924311       | AB2-078 C O1 | 1.3464           |
| 924321       | AB2-079 C O1 | 1.3464           |
| 924501       | AB2-099 C    | 0.3930           |
| 924511       | AB2-100 C    | 9.3880           |
| 925021       | AB2-158 C    | 24.8965          |
| 925061       | AB2-161 C O1 | 2.1136           |
| 925121       | AB2-169 C    | 4.2972           |
| 925171       | AB2-174 C O1 | 4.8598           |
| 925591       | AC1-034 C    | 4.5160           |
| 925611       | AC1-036 C    | 0.6519           |
| 925781       | AC1-054 C O1 | 4.9120           |
| 926071       | AC1-086 C    | 14.0758          |
| 926201       | AC1-098 C    | 4.1289           |
| 926211       | AC1-099 C    | 1.3836           |
| 926271       | AC1-105 C O1 | 3.7753           |
| 926661       | AC1-147 C    | 1.4645           |
| 926751       | AC1-161 C O1 | 23.3949          |
| 927021       | AC1-189 C    | 5.6996           |
| 927141       | AC1-208 C    | 6.0727           |
| 927261       | AC1-222 C    | 2.4104           |
| 932041       | AC2-012 C    | 6.6251           |
| 932511       | AC2-071 C    | 1.5504           |
| 932581       | AC2-078 C O1 | 2.4496           |
| 932591       | AC2-079 C O1 | 3.6482           |
| 932631       | AC2-084 C    | 5.8859           |
| 933291       | AC2-141 C    | 23.3949          |
| 933501       | AC2-165 C    | 9.6131           |
| 933731       | AC2-196 C    | 1.3806           |
| 933991       | AD1-023 C    | 8.7483           |
| 934061       | AD1-033 C    | 5.7952           |
| 934201       | AD1-047 C    | 5.5296           |
| 934311       | AD1-055 C    | 1.6736           |
| 934331       | AD1-057 C O1 | 6.6934           |
| 934521       | AD1-076 C    | 36.1597          |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 934571 | AD1-082 C                          | 4.8167    |
| 934611 | AD1-087 C O1                       | 7.2788    |
| 934621 | AD1-088 C                          | 10.6136   |
| 935111 | AD1-144 C                          | 1.0854    |
| 935171 | AD1-152 C O1                       | 7.2336    |
| 935211 | AD1-156 C                          | 1.3235    |
| 935221 | AD1-157 C                          | 1.0500    |
| 935231 | AD1-160 C                          | 0.7700    |
| 936261 | AD2-033 C                          | 8.8928    |
| 936331 | AD2-043 C (Withdrawn : 12/20/2019) | 3.1370    |
| 936361 | AD2-046 C O1                       | 6.0284    |
| 936401 | AD2-051 C O1                       | 5.8775    |
| 936481 | AD2-063 C O1                       | 10.1829   |
| 936661 | AD2-085 C                          | 2.1874    |
| 936701 | AD2-089 C (Withdrawn : 12/09/2019) | 4.7809    |
| 936711 | AD2-090 C O1                       | 4.7781    |
| 937221 | AD2-160 C O1                       | 4.5175    |
| 937481 | AD2-202 C O1                       | 1.9290    |
| 937541 | AD2-215 C                          | 1.0966    |
| 937571 | AD2-169 C                          | 6.8784    |
| 938171 | AE1-026 C O1                       | 21.3617   |
| 938181 | AE1-027 C                          | 1.8070    |
| 938191 | AE1-028 C                          | 1.0483    |
| 938221 | AE1-035 C                          | 1.5023    |
| 938371 | AE1-056 C                          | 4.5268    |
| 938491 | AE1-068 C O1                       | 61.9269   |
| 938501 | AE1-069 C O1                       | 48.4492   |
| 938531 | AE1-072 C O1                       | 13.5526   |
| 938551 | AE1-074 C                          | 2.0377    |
| 938561 | AE1-075 C                          | 2.1347    |
| 938631 | AE1-085 C O1                       | 5.3996    |
| 938661 | AE1-088                            | 2.2037    |
| 938771 | AE1-103 C O1                       | 2.3989    |
| 939181 | AE1-148 C O1                       | 5.9468    |
| 939191 | AE1-149 C O1                       | 6.4051    |
| 939231 | AE1-154 C                          | 4.0814    |
| 939311 | AE1-162 C                          | 1.2822    |
| 939371 | AE1-168 C (Withdrawn : 01/08/2020) | 10.3948   |
| 939411 | AE1-173 C                          | 85.6032   |
| 940061 | AE2-000BC O1                       | 10.0116   |
| 940241 | AE2-006                            | 0.3317    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 940251       | AE2-007 O1   | 112.7510         |
| 940471       | AE2-031 C    | 33.8378          |
| 940481       | AE2-033 C    | 12.9940          |
| 940491       | AE2-034 C    | 2.9496           |
| 940521       | AE2-037 C    | 5.3773           |
| 940541       | AE2-040 O1   | 2.5910           |
| 940571       | AE2-044 C    | 1.5677           |
| 940641       | AE2-051 C O1 | 17.2521          |
| 940651       | AE2-052      | 1.1316           |
| 940661       | AE2-053 O1   | 2.2025           |
| 941031       | AE2-094 C    | 40.5698          |
| 941101       | AE2-104 C O1 | 2.2691           |
| 941281       | AE2-122 C O1 | 21.8472          |
| 941291       | AE2-123 C O1 | 22.4521          |
| 941301       | AE2-124 C O1 | 20.4277          |
| 941501       | AE2-147 C    | 10.4132          |
| 941541       | AE2-151 C    | 0.7284           |
| 941591       | AE2-156 O1   | 11.6348          |
| 941601       | AE2-157 C    | 6.5836           |
| 941791       | AE2-182 C    | 2.0216           |
| 942131       | AE2-225 C    | 1.3950           |
| 942171       | AE2-229 C    | 1.3950           |
| 942341       | AE2-247 C    | 0.5024           |
| 942401       | AE2-253 C    | 4.7517           |
| 942451       | AE2-258      | 1.5845           |
| 942461       | AE2-259 C O1 | 8.3514           |
| 942471       | AE2-260 C O1 | 11.6533          |
| 942851       | AE2-304 C    | 0.4153           |
| 942931       | AE2-313 C    | 36.6381          |
| 943171       | AE2-346 C    | 0.4999           |
| 943451       | AF1-016 C O1 | 0.4713           |
| 943461       | AF1-017 C    | 0.4545           |
| 943611       | AF1-032 C    | 0.6038           |
| 943901       | AF1-058 C    | 0.7027           |
| 943911       | AF1-059      | 6.0673           |
| 944011       | AF1-069 C    | 13.2557          |
| 944051       | AF1-073 C O1 | 7.1711           |
| 944061       | AF1-074 C O1 | 2.3595           |
| 944111       | AF1-079 C    | 7.7547           |
| 944141       | AF1-082      | 1.0078           |

| Bus #   | Bus                                   | MW Impact |
|---------|---------------------------------------|-----------|
| 944581  | AF1-123 C O1                          | 34.0072   |
| 944591  | AF1-124 C O1                          | 34.0072   |
| 944601  | AF1-125 C O1                          | 34.0072   |
| 944871  | AF1-152 C                             | 1.8397    |
| 945711  | AF1-236 C O1                          | 27.6780   |
| 945811  | AF1-246 C O1                          | 7.2269    |
| 946011  | AF1-266                               | 10.8770   |
| 946281  | AF1-292 C                             | 1.2258    |
| 946301  | AF1-294 C                             | 1.8457    |
| 946371  | AF1-301 C                             | 36.8780   |
| 946461  | AF1-310 C O1 (Withdrawn : 11/05/2019) | 18.5877   |
| LGEE    | LGEE                                  | 1.0697    |
| CPL     | CPL                                   | 6.9266    |
| WEC     | WEC                                   | 0.5405    |
| CBM-W2  | CBM-W2                                | 24.7256   |
| NY      | NY                                    | 2.2220    |
| CBM-W1  | CBM-W1                                | 19.2279   |
| TVA     | TVA                                   | 5.4712    |
| CBM-S2  | CBM-S2                                | 47.5174   |
| CBM-S1  | CBM-S1                                | 30.0841   |
| MADISON | MADISON                               | 1.7136    |
| MEC     | MEC                                   | 3.5006    |
| AA2-074 | AA2-074                               | 4.7191    |

| 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881058 | 314919    | 80X      | DVP           | 314904  | 8CLIFTON | DVP         | 1      | DVP_P1-2: LN 569 | single | 2442.12    | 103.65                | 103.7                  | DC    | 27.93     |

| Bus #  | Bus                               | MW Impact |
|--------|-----------------------------------|-----------|
| 314131 | 6ARNOLDS                          | 0.1721    |
| 314134 | 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   |
| 315008 | 1POSSM6A                          | 2.9757    |
| 315009 | 1POSSM6B                          | 2.9757    |
| 315010 | 1POSSM6S                          | 4.6370    |
| 315033 | 1BIRCHWDA                         | 4.5390    |
| 315037 | 1LDYSMT1                          | 3.1029    |
| 315038 | 1LDYSMT2                          | 3.1009    |
| 315039 | 1LDYSMT3                          | 3.2816    |
| 315040 | 1LDYSMT4                          | 3.2877    |
| 315041 | 1LDYSMT5                          | 3.2980    |
| 315043 | 1FOUR RIVERA                      | 1.7818    |
| 315044 | 1FOUR RIVERB                      | 1.7818    |
| 315045 | 1FOUR RIVERC                      | 2.1859    |
| 315046 | 1FOUR RIVERD                      | 1.7818    |
| 315047 | 1FOUR RIVERE                      | 1.7818    |
| 315048 | 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   |
| 315225 | 1N ANNA1                          | 19.4117   |
| 315226 | 1N ANNA2                          | 19.4199   |
| 315610 | 6AA1-145GAS                       | 6.2455    |
| 924061 | AB2-050                           | 0.3674    |
| 924241 | AB2-068 OP                        | 111.6699  |
| 925021 | 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>CPL</b>     | CPL        | 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           |

| 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|-----------------|---------|------------|-----------------------|------------------------|-------|-----------|
| 42880718 | 314924    | 8SURREY  | DVP           | 314903  | 8CHCKAHM | DVP         | 1      | DVP_P4-2: 56372 | breaker | 3144.0     | 112.37                | 115.2                  | DC    | 283.93    |

| Bus #  | Bus          | MW Impact |
|--------|--------------|-----------|
| 314295 | 6BIRDNECK    | 0.0645    |
| 314491 | 3PENDLTN     | 0.4808    |
| 315108 | 1ELIZAR1     | 4.7011    |
| 315109 | 1ELIZAR2     | 4.6195    |
| 315110 | 1ELIZAR3     | 4.7613    |
| 315233 | 1SURREY 2    | 46.5632   |
| 901082 | W1-029 E     | 63.0875   |
| 913392 | Y1-086 E     | 3.1027    |
| 916042 | Z1-036 E     | 60.6613   |
| 916192 | Z1-068 E     | 3.2335    |
| 917122 | Z2-027 E     | 1.4813    |
| 919152 | AA1-139 E    | 9.3146    |
| 923831 | AB2-022 C    | 3.2528    |
| 923832 | AB2-022 E    | 1.7515    |
| 925522 | AC1-027 E    | 1.9683    |
| 926661 | AC1-147 C    | 3.2708    |
| 926662 | AC1-147 E    | 1.9210    |
| 926751 | AC1-161 C O1 | 61.2568   |
| 926752 | AC1-161 E O1 | 26.1488   |
| 932041 | AC2-012 C    | 14.7966   |
| 932042 | AC2-012 E    | 24.1419   |
| 933291 | AC2-141 C    | 61.2568   |
| 933292 | AC2-141 E    | 26.1488   |
| 933731 | AC2-196 C    | 3.1076    |
| 933732 | AC2-196 E    | 2.0697    |
| 934061 | AD1-033 C    | 13.0347   |
| 934062 | AD1-033 E    | 8.6898    |
| 935111 | AD1-144 C    | 2.2819    |
| 935112 | AD1-144 E    | 1.2468    |
| 937221 | AD2-160 C O1 | 10.0443   |
| 937222 | AD2-160 E O1 | 5.2672    |
| 937541 | AD2-215 C    | 2.3054    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 937542       | AD2-215 E    | 1.2233           |
| 938181       | AE1-027 C    | 4.0497           |
| 938182       | AE1-027 E    | 2.1331           |
| 938191       | AE1-028 C    | 2.3495           |
| 938192       | AE1-028 E    | 1.3602           |
| 938491       | AE1-068 C O1 | 77.0540          |
| 938492       | AE1-068 E O1 | 42.5579          |
| 938501       | AE1-069 C O1 | 60.1557          |
| 938502       | AE1-069 E O1 | 34.3915          |
| 938531       | AE1-072 C O1 | 25.3517          |
| 938532       | AE1-072 E O1 | 13.2158          |
| 939411       | AE1-173 C    | 150.3024         |
| 939412       | AE1-173 E    | 100.2016         |
| 940251       | AE2-007 O1   | 297.5854         |
| 940471       | AE2-031 C    | 42.0332          |
| 940472       | AE2-031 E    | 28.0221          |
| 940641       | AE2-051 C O1 | 28.1808          |
| 940642       | AE2-051 E O1 | 18.7872          |
| 941031       | AE2-094 C    | 50.6750          |
| 941032       | AE2-094 E    | 22.6961          |
| 941281       | AE2-122 C O1 | 48.9587          |
| 941282       | AE2-122 E O1 | 197.5601         |
| 941291       | AE2-123 C O1 | 50.3144          |
| 941292       | AE2-123 E O1 | 196.2044         |
| 941301       | AE2-124 C O1 | 45.7929          |
| 941302       | AE2-124 E O1 | 200.9339         |
| 941501       | AE2-147 C    | 21.7543          |
| 941502       | AE2-147 E    | 14.5029          |
| 941591       | AE2-156 O1   | 30.6360          |
| 942131       | AE2-225 C    | 2.9813           |
| 942132       | AE2-225 E    | 1.9875           |
| 942171       | AE2-229 C    | 2.9813           |
| 942172       | AE2-229 E    | 1.9875           |
| 942401       | AE2-253 C    | 10.5649          |
| 942402       | AE2-253 E    | 4.7466           |
| 942851       | AE2-304 C    | 0.8539           |
| 942852       | AE2-304 E    | 0.3321           |
| 942931       | AE2-313 C    | 45.5118          |
| 942932       | AE2-313 E    | 30.3412          |
| 943451       | AF1-016 C O1 | 0.4058           |

| <b>Bus #</b>   | <b>Bus</b>   | <b>MW Impact</b> |
|----------------|--------------|------------------|
| <b>943452</b>  | AF1-016 E O1 | 0.6455           |
| <b>943611</b>  | AF1-032 C    | 1.2904           |
| <b>943612</b>  | AF1-032 E    | 0.6847           |
| <b>944011</b>  | AF1-069 C    | 8.7754           |
| <b>944012</b>  | AF1-069 E    | 3.4091           |
| <b>944581</b>  | AF1-123 C O1 | 78.5653          |
| <b>944582</b>  | AF1-123 E O1 | 205.3667         |
| <b>944591</b>  | AF1-124 C O1 | 78.5653          |
| <b>944592</b>  | AF1-124 E O1 | 205.3667         |
| <b>944601</b>  | AF1-125 C O1 | 78.5653          |
| <b>944602</b>  | AF1-125 E O1 | 205.3667         |
| <b>944871</b>  | AF1-152 C    | 3.8433           |
| <b>944872</b>  | AF1-152 E    | 2.5622           |
| <b>LGEE</b>    | LGEE         | 1.2967           |
| <b>CPL</b>     | CPL          | 9.3926           |
| <b>WEC</b>     | WEC          | 0.6779           |
| <b>CBM-W2</b>  | CBM-W2       | 31.1302          |
| <b>NY</b>      | NY           | 1.6502           |
| <b>CBM-W1</b>  | CBM-W1       | 24.6072          |
| <b>TVA</b>     | TVA          | 6.8642           |
| <b>O-066</b>   | O-066        | 22.3171          |
| <b>CBM-S2</b>  | CBM-S2       | 62.9211          |
| <b>CBM-S1</b>  | CBM-S1       | 37.6158          |
| <b>G-007</b>   | G-007        | 3.4830           |
| <b>MADISON</b> | MADISON      | 2.2660           |
| <b>MEC</b>     | MEC          | 4.3920           |
| <b>AA2-074</b> | AA2-074      | 6.3976           |

| 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880954 | 314934    | 8SPOTSYL | DVP           | 314916  | 8MORRSVL | DVP         | 1      | DVP_P1-2: LN 552 | single | 3218.56    | 119.86                | 119.94                 | DC    | 50.69     |

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

| 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 |
|----------|-----------|-------------|---------------|---------|--------------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880855 | 927250    | AC1-221 TAP | DVP           | 304070  | 6PERSON230 T | CPL         | 1      | DVP_P1-2: LN 570 | single | 718.0      | 122.95                | 125.09                 | DC    | 15.52     |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 313853 | 3PONTONDP                          | 0.0570    |
| 314295 | 6BIRDNECK                          | 0.0129    |
| 314333 | 6POWHATN                           | 0.1249    |
| 314429 | 3JTRSVLE                           | 0.2280    |
| 314491 | 3PENDLTN                           | 0.0963    |
| 314507 | 3THOMPSN                           | 0.0977    |
| 314677 | 6BUCKING                           | 0.1929    |
| 314704 | 3LAWRENC                           | 0.1015    |
| 314947 | 8GREENSVILLE                       | 23.0274   |
| 315098 | 1CHESPKA                           | 0.1295    |
| 315099 | 1CHESPKB (Deactivation : 05/31/19) | 0.9868    |
| 315102 | 1BRUNSWICKG1                       | 3.9336    |
| 315103 | 1BRUNSWICKG2                       | 3.9336    |
| 315104 | 1BRUNSWICKG3                       | 3.9336    |
| 315105 | 1BRUNSWICKS1                       | 8.1721    |
| 315108 | 1ELIZAR1                           | 0.9552    |
| 315109 | 1ELIZAR2                           | 0.9386    |
| 315110 | 1ELIZAR3                           | 0.9674    |
| 315153 | 1CLOVER1                           | 14.3989   |
| 315154 | 1CLOVER2                           | 14.2554   |
| 315191 | 1BEARGRDN G1                       | 1.5614    |
| 315192 | 1BEARGRDN G2                       | 1.5614    |
| 315193 | 1BEARGRDN S1                       | 3.2135    |
| 315233 | 1SURRY 2                           | 7.6012    |
| 315260 | 1GOSPORTA                          | 0.1032    |
| 315261 | 1GOSPORTB                          | 0.1319    |
| 315262 | 1GOSPORTC                          | 0.1119    |
| 315266 | 1PLYWOOD A                         | 1.7461    |
| 920291 | AA2-127                            | 0.3244    |
| 924021 | AB2-043 C O1                       | 2.4166    |
| 924161 | AB2-060 C OP                       | 6.9588    |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 924301 | AB2-077 C O1                       | 1.5570    |
| 924311 | AB2-078 C O1                       | 1.5570    |
| 924321 | AB2-079 C O1                       | 1.5570    |
| 925611 | AC1-036 C                          | 0.7279    |
| 925831 | AC1-062                            | 0.0338    |
| 925991 | AC1-075 C                          | 7.3467    |
| 926021 | AC1-080 C                          | 2.4553    |
| 926271 | AC1-105 C O1                       | 9.4015    |
| 926661 | AC1-147 C                          | 0.7846    |
| 926751 | AC1-161 C O1                       | 11.5301   |
| 927251 | AC1-221 C                          | 9.8772    |
| 927261 | AC1-222 C                          | 6.5915    |
| 932041 | AC2-012 C                          | 3.5494    |
| 932511 | AC2-071 C                          | 1.3618    |
| 932761 | AC2-100 C                          | 22.7311   |
| 933291 | AC2-141 C                          | 11.5301   |
| 933501 | AC2-165 C                          | 3.7688    |
| 934061 | AD1-033 C                          | 2.5679    |
| 934311 | AD1-055 C                          | 4.5767    |
| 934341 | AD1-058 C                          | 24.7606   |
| 934611 | AD1-087 C O1                       | 15.4053   |
| 934621 | AD1-088 C                          | 11.6382   |
| 934991 | AD1-131 C                          | 8.1182    |
| 935171 | AD1-152 C O1                       | 15.3096   |
| 935221 | AD1-157 C                          | 1.1478    |
| 935231 | AD1-160 C                          | 0.8417    |
| 936261 | AD2-033 C                          | 9.9676    |
| 936331 | AD2-043 C (Withdrawn : 12/20/2019) | 8.5281    |
| 936361 | AD2-046 C O1                       | 3.9204    |
| 936481 | AD2-063 C O1                       | 11.5020   |
| 937481 | AD2-202 C O1                       | 4.0826    |
| 938371 | AE1-056 C                          | 4.9482    |
| 938491 | AE1-068 C O1                       | 31.9201   |
| 938501 | AE1-069 C O1                       | 25.7579   |
| 938561 | AE1-075 C                          | 0.7846    |
| 939181 | AE1-148 C O1                       | 4.0187    |
| 939371 | AE1-168 C (Withdrawn : 01/08/2020) | 11.4894   |
| 939411 | AE1-173 C                          | 37.2816   |
| 940241 | AE2-006                            | 0.3704    |
| 940251 | AE2-007 O1                         | 60.4847   |

| Bus #      | Bus                                   | MW Impact |
|------------|---------------------------------------|-----------|
| 940471     | AE2-031 C                             | 18.0734   |
| 940641     | AE2-051 C O1                          | 7.4826    |
| 940661     | AE2-053 O1                            | 1.4884    |
| 941031     | AE2-094 C                             | 19.7130   |
| 941281     | AE2-122 C O1                          | 9.7739    |
| 941291     | AE2-123 C O1                          | 10.0446   |
| 941301     | AE2-124 C O1                          | 9.1209    |
| 941591     | AE2-156 O1                            | 6.2430    |
| 941791     | AE2-182 C                             | 2.2168    |
| 942451     | AE2-258                               | 1.8028    |
| 942461     | AE2-259 C O1                          | 7.6440    |
| 942751     | AE2-291 C O1                          | 9.2075    |
| 942761     | AE2-292 C O1                          | 11.4643   |
| 942931     | AE2-313 C                             | 19.5691   |
| 943901     | AF1-058 C                             | 3.7769    |
| 943911     | AF1-059                               | 8.8730    |
| 944011     | AF1-069 C                             | 6.4410    |
| 944581     | AF1-123 C O1                          | 15.5158   |
| 944591     | AF1-124 C O1                          | 15.5158   |
| 944601     | AF1-125 C O1                          | 15.5158   |
| 945811     | AF1-246 C O1                          | 8.1358    |
| 946301     | AF1-294 C                             | 3.8283    |
| 946461     | AF1-310 C O1 (Withdrawn : 11/05/2019) | 26.6361   |
| DUCKCREEK  | DUCKCREEK                             | 4.2467    |
| NEWTON     | NEWTON                                | 4.2056    |
| FARMERCITY | FARMERCITY                            | 0.2430    |
| G-007A     | G-007A                                | 2.7284    |
| VFT        | VFT                                   | 7.2498    |
| AF1-020    | AF1-020                               | 18.1800   |
| PRAIRIE    | PRAIRIE                               | 11.4504   |
| AC1-131    | AC1-131                               | 10.9538   |
| COFFEEN    | COFFEEN                               | 2.0828    |
| EDWARDS    | EDWARDS                               | 1.2617    |
| CHEOAH     | CHEOAH                                | 3.5636    |
| TILTON     | TILTON                                | 2.2283    |
| GIBSON     | GIBSON                                | 2.0235    |
| CALDERWOOD | CALDERWOOD                            | 3.4696    |
| BLUEG      | BLUEG                                 | 6.2288    |
| TRIMBLE    | TRIMBLE                               | 1.9750    |
| CATAWBA    | CATAWBA                               | 3.8616    |

## Short Circuit

## 12.7 Short Circuit

The following Breakers are overdutied:

None

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

The Queue Project AF1-123 was evaluated as an 880.0 MW (Capacity 267.5 MW) injection at the Landstown 230 kV substation in the Dominion area. Project AF1-123 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-123 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 | CK T ID | CONT NAME        | Type   | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|----------|-------|---------------|---------|----------|-------|-------------|---------|------------------|--------|------------|------------------------|-------------------------|--------|------------|
| 42880913 | 314902    | 8CARSON  | 500.0 | DVP           | 314914  | 8MDLTHAN | 500.0 | DVP         | 1       | DVP_P1-2: LN 574 | single | 3218.56    | 99.71                  | 101.61                  | DC     | 61.01      |

### 13.2 Multiple Facility Contingency

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

None

### 13.3 Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

| ID       | FROM BUS# | FROM BUS    | kV    | FROM BUS AREA | TO BUS# | TO BUS      | kV    | TO BUS AREA | CK T ID | CONT NAME         | Type    | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|-------------|-------|---------------|---------|-------------|-------|-------------|---------|-------------------|---------|------------|------------------------|-------------------------|--------|------------|
| 42880723 | 314902    | 8CARSON     | 500.0 | DVP           | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | DVP_P4-2: 557T574 | breaker | 3938.0     | 112.19                 | 116.86                  | DC     | 267.51     |
| 42880724 | 314902    | 8CARSON     | 500.0 | DVP           | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | DVP_P4-2: H2T557  | breaker | 3938.0     | 106.12                 | 110.64                  | DC     | 258.99     |
| 42880910 | 314902    | 8CARSON     | 500.0 | DVP           | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | DVP_P1-2: LN 557  | single  | 3218.56    | 119.48                 | 119.97                  | DC     | 69.8       |
| 42880713 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | DVP_P4-2: 56372   | breaker | 3144.0     | 136.94                 | 137.54                  | DC     | 283.35     |
| 42880714 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | DVP_P4-2: 563T576 | breaker | 3144.0     | 136.6                  | 137.23                  | DC     | 288.28     |
| 42880843 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | DVP_P1-2: LN 563  | single  | 2442.12    | 162.2                  | 163.18                  | DC     | 76.27      |
| 42880844 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | DVP_P1-2: LN 576  | single  | 2442.12    | 160.35                 | 161.26                  | DC     | 76.29      |
| 42880852 | 314903    | 8CHCKAHM    | 500.0 | DVP           | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | Base Case         | single  | 2442.12    | 131.93                 | 132.81                  | DC     | 61.51      |
| 42880898 | 314905    | 8CHANCE     | 500.0 | DVP           | 314900  | 8BRISTER    | 500.0 | DVP         | 1       | DVP_P1-2: LN 594  | single  | 2442.12    | 141.13                 | 141.22                  | DC     | 46.45      |
| 42880900 | 314905    | 8CHANCE     | 500.0 | DVP           | 314900  | 8BRISTER    | 500.0 | DVP         | 1       | DVP_P1-2: LN 573  | single  | 2442.12    | 134.88                 | 135.32                  | DC     | 45.62      |
| 42881003 | 314908    | 8ELMONT     | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P1-2: LN 576  | single  | 4070.2     | 114.77                 | 114.97                  | DC     | 78.73      |
| 42880927 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P1-2: LN 573  | single  | 2442.12    | 128.92                 | 129.34                  | DC     | 40.13      |

| ID       | FROM BUS# | FROM BUS    | kV    | FROM BUS AREA | TO BUS# | TO BUS      | kV    | TO BUS AREA | CK T ID | CONT NAME              | Type    | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|-------------|-------|---------------|---------|-------------|-------|-------------|---------|------------------------|---------|------------|------------------------|-------------------------|--------|------------|
| 42880928 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P1-2: LN 594       | single  | 2442.12    | 128.59                 | 129.02                  | DC     | 40.02      |
| 42880940 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P1-2: LN 573       | single  | 2738.22    | 127.38                 | 127.46                  | DC     | 47.23      |
| 42880941 | 314911    | 8LADYSMIT H | 500.0 | DVP           | 314905  | 8CHANCE     | 500.0 | DVP         | 1       | DVP_P1-2: LN 594       | single  | 2738.22    | 126.27                 | 126.35                  | DC     | 45.5       |
| 42880863 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P1-2: LN 574       | single  | 2442.12    | 149.16                 | 149.62                  | DC     | 67.98      |
| 42880864 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P1-2: LN 557       | single  | 2442.12    | 138.44                 | 138.83                  | DC     | 66.95      |
| 42880872 | 314914    | 8MDLTHAN    | 500.0 | DVP           | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | Base Case              | single  | 2442.12    | 102.25                 | 103.53                  | DC     | 49.35      |
| 42881042 | 314916    | 8MORRSVL    | 500.0 | DVP           | 314913  | 8LOUDOUN    | 500.0 | DVP         | 1       | DVP_P1-2: LN 580       | single  | 2738.22    | 105.69                 | 106.04                  | DC     | 30.1       |
| 42880753 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P4-2: SPOTS H1T594 | breaker | 3938.0     | 103.72                 | 103.99                  | DC     | 121.37     |
| 42880988 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P1-2: LN 573       | single  | 3218.56    | 107.55                 | 108.6                   | DC     | 33.5       |
| 42881020 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314934  | 8SPOTSYL    | 500.0 | DVP         | 1       | DVP_P1-2: LN 581       | single  | 3218.56    | 115.05                 | 115.09                  | DC     | 51.11      |
| 42881021 | 314918    | 8NO ANNA    | 500.0 | DVP           | 314934  | 8SPOTSYL    | 500.0 | DVP         | 1       | DVP_P1-2: LN 575       | single  | 3218.56    | 111.83                 | 112.31                  | DC     | 40.83      |
| 42881058 | 314919    | 8OX         | 500.0 | DVP           | 314904  | 8CLIFTON    | 500.0 | DVP         | 1       | DVP_P1-2: LN 569       | single  | 2442.12    | 103.63                 | 103.67                  | DC     | 27.86      |
| 42880718 | 314924    | 8SURRY      | 500.0 | DVP           | 314903  | 8CHCKAHM    | 500.0 | DVP         | 1       | DVP_P4-2: 56372        | breaker | 3144.0     | 112.34                 | 114.39                  | DC     | 271.37     |
| 42880719 | 314924    | 8SURRY      | 500.0 | DVP           | 314903  | 8CHCKAHM    | 500.0 | DVP         | 1       | DVP_P4-2: 563T576      | breaker | 3144.0     | 104.46                 | 106.4                   | DC     | 263.0      |
| 42880738 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL    | 500.0 | DVP         | 1       | DVP_P4-2: 568T575      | breaker | 3938.0     | 108.43                 | 108.65                  | DC     | 156.39     |
| 42880739 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL    | 500.0 | DVP         | 1       | DVP_P4-2: 57502        | breaker | 3938.0     | 103.26                 | 103.46                  | DC     | 146.63     |
| 42880953 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL    | 500.0 | DVP         | 1       | DVP_P1-2: LN 575       | single  | 3218.56    | 115.18                 | 115.98                  | DC     | 40.28      |
| 42880954 | 314934    | 8SPOTSYL    | 500.0 | DVP           | 314916  | 8MORRSVL    | 500.0 | DVP         | 1       | DVP_P1-2: LN 552       | single  | 3218.56    | 119.85                 | 119.87                  | DC     | 50.47      |
| 42880855 | 927250    | AC1-221 TAP | 230.0 | DVP           | 304070  | 6PERSON230T | 230.0 | CPL         | 1       | DVP_P1-2: LN 570       | single  | 718.0      | 122.98                 | 125.04                  | DC     | 14.96      |

### 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    | FRO M BUS AREA | TO BUS# | TO BUS      | kV    | TO BUS AREA | CK T ID | CONT NAME         | Type       | Rating MVA | PRE PROJE C T LOADIN G % | POST PROJE C T LOADIN G % | AC D C | MW IMPAC T |
|----------|-----------|-------------|-------|----------------|---------|-------------|-------|-------------|---------|-------------------|------------|------------|--------------------------|---------------------------|--------|------------|
| 42880909 | 314902    | 8CARSON     | 500.0 | DVP            | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 557 | operatio n | 3218.56    | 127.7                    | 133.2                     | DC     | 252.27     |
| 42880917 | 314902    | 8CARSON     | 500.0 | DVP            | 314914  | 8MDLTHAN    | 500.0 | DVP         | 1       | Base Case         | operatio n | 3218.56    | 100.6                    | 101.8                     | DC     | 179.21     |
| 42880841 | 314903    | 8CHCKAH M   | 500.0 | DVP            | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | DVP_P 1-2: LN 563 | operatio n | 2442.12    | 169.76                   | 170.58                    | DC     | 275.62     |
| 42880848 | 314903    | 8CHCKAH M   | 500.0 | DVP            | 314908  | 8ELMONT     | 500.0 | DVP         | 1       | Base Case         | operatio n | 2442.12    | 139.39                   | 140.15                    | DC     | 222.28     |
| 42881002 | 314908    | 8ELMONT     | 500.0 | DVP            | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P 1-2: LN 576 | operatio n | 4070.2     | 119.49                   | 119.6                     | DC     | 284.54     |
| 42880921 | 314911    | 8LADYSMIT H | 500.0 | DVP            | 314922  | 8POSSUM     | 500.0 | DVP         | 1       | DVP_P 1-2: LN 581 | operatio n | 2442.12    | 137.65                   | 137.66                    | DC     | 147.07     |
| 42880861 | 314914    | 8MDLTHAN    | 500.0 | DVP            | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 557 | operatio n | 2442.12    | 145.86                   | 152.37                    | DC     | 241.96     |
| 42880871 | 314914    | 8MDLTHAN    | 500.0 | DVP            | 314918  | 8NO ANNA    | 500.0 | DVP         | 1       | Base Case         | operatio n | 2442.12    | 115.66                   | 116.95                    | DC     | 178.35     |
| 42880986 | 314918    | 8NO ANNA    | 500.0 | DVP            | 314911  | 8LADYSMIT H | 500.0 | DVP         | 1       | DVP_P 1-2: LN 594 | operatio n | 3218.56    | 119.25                   | 119.9                     | DC     | 114.36     |
| 42881019 | 314918    | 8NO ANNA    | 500.0 | DVP            | 314934  | 8SPOTSYL    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 575 | operatio n | 3218.56    | 116.43                   | 116.71                    | DC     | 147.56     |
| 42881051 | 314923    | 8SEPTA      | 500.0 | DVP            | 314924  | 8SURREY     | 500.0 | DVP         | 1       | DVP_P 1-2: LN 563 | operatio n | 2442.12    | 101.12                   | 101.94                    | DC     | 149.27     |
| 42880873 | 314924    | 8SURREY     | 500.0 | DVP            | 314903  | 8CHCKAH M   | 500.0 | DVP         | 1       | DVP_P 1-2: LN 563 | operatio n | 2442.12    | 132.05                   | 134.55                    | DC     | 258.18     |
| 42880950 | 314934    | 8SPOTSYL    | 500.0 | DVP            | 314916  | 8MORRSVL    | 500.0 | DVP         | 1       | DVP_P 1-2: LN 575 | operatio n | 3218.56    | 125.75                   | 126.04                    | DC     | 145.59     |

## 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_P4-2: H2T557</b> | CONTINGENCY 'DVP_P4-2: H2T557' /* ELMONT 500 KV<br>OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM 500.00<br>OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT 500.00<br>OPEN BRANCH FROM BUS 314218 TO BUS 314908 CKT 2 /* 6ELMONT 230.00 - 8ELMONT 500.00<br>END |
| <b>DVP_P1-2: LN 594</b> | CONTINGENCY 'DVP_P1-2: LN 594'<br>OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00<br>END                                                                                                                                                                                               |
| <b>DVP_P1-2: LN 557</b> | CONTINGENCY 'DVP_P1-2: LN 557'<br>OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM 500.00<br>OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT 500.00<br>END                                                                                                        |
| <b>DVP_P1-2: LN 563</b> | CONTINGENCY 'DVP_P1-2: LN 563'<br>OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN 500.00<br>END                                                                                                                                                                                                |
| <b>DVP_P1-2: LN 552</b> | CONTINGENCY 'DVP_P1-2: LN 552'<br>OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 1 /* 3CHANCE 115.00 - 8CHANCE 500.00<br>OPEN BRANCH FROM BUS 314900 TO BUS 314905 CKT 1 /* 8BRISTER 500.00 - 8CHANCE 500.00<br>END                                                                                                          |
| <b>DVP_P1-2: LN 570</b> | CONTINGENCY 'DVP_P1-2: LN 570'<br>OPEN BRANCH FROM BUS 304183 TO BUS 314935 CKT 1 /* 8WAKE 500 TT500.00 - 8HERITAGE 500.00<br>END                                                                                                                                                                                           |

| Contingency Name  | Contingency Definition                                                                                                                                                                                                                                                                                                                   |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DVP_P1-2: LN 573  | CONTINGENCY 'DVP_P1-2: LN 573'<br>OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL<br>500.00<br>END                                                                                                                                                                                                         |
| DVP_P1-2: LN 575  | CONTINGENCY 'DVP_P1-2: LN 575'<br>OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA<br>500.00<br>END                                                                                                                                                                                                       |
| DVP_P1-2: LN 574  | CONTINGENCY 'DVP_P1-2: LN 574'<br>OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH<br>500.00<br>END                                                                                                                                                                                                        |
| DVP_P4-2: 56372   | CONTINGENCY 'DVP_P4-2: 56372' /* CARSON 500 KV<br>OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN<br>500.00<br>OPEN BRANCH FROM BUS 314282 TO BUS 314902 CKT 1 /* 6CARSON 230.00 - 8CARSON 500.00<br>END                                                                                                    |
| DVP_P1-2: LN 576  | CONTINGENCY 'DVP_P1-2: LN 576'<br>OPEN BRANCH FROM BUS 314914 TO BUS 314918 CKT 1 /* 8MDLTHAN 500.00 - 8NO ANNA<br>500.00<br>END                                                                                                                                                                                                         |
| DVP_P4-2: 557T574 | CONTINGENCY 'DVP_P4-2: 557T574' /* ELMONT 500 KV<br>OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM<br>500.00<br>OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT<br>500.00<br>OPEN BRANCH FROM BUS 314908 TO BUS 314911 CKT 1 /* 8ELMONT 500.00 - 8LADYSMITH<br>500.00<br>END |
| DVP_P4-2: 568T575 | CONTINGENCY 'DVP_P4-2: 568T575' /* LADYSMITH 500 KV<br>OPEN BRANCH FROM BUS 314911 TO BUS 314922 CKT 1 /* 8LADYSMITH 500.00 - 8POSSUM<br>500.00<br>OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA<br>500.00<br>END                                                                                      |
| Base Case         |                                                                                                                                                                                                                                                                                                                                          |

| Contingency Name              | Contingency Definition                                                                                                                                                                                                                                               |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DVP_P1-2: LN 580</b>       | CONTINGENCY 'DVP_P1-2: LN 580'<br>OPEN BRANCH FROM BUS 235110 TO BUS 314929 CKT 1      /* 01MDWBRK 500.00 - 8FRONT<br>ROYAL500.00<br>END                                                                                                                             |
| <b>DVP_P4-2: SPOTS H1T594</b> | CONTINGENCY 'DVP_P4-2: SPOTS H1T594'      /* SPOTSYLVANIA 500 KV<br>OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1      /* 8MORRSVL 500.00 - 8SPOTSYL<br>500.00<br>OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1      /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00<br>END |
| <b>DVP_P1-2: LN 569</b>       | CONTINGENCY 'DVP_P1-2: LN 569'<br>OPEN BRANCH FROM BUS 314913 TO BUS 314916 CKT 1      /* 8LOUDOUN 500.00 - 8MORRSVL<br>500.00<br>END                                                                                                                                |
| <b>DVP_P4-2: 563T576</b>      | CONTINGENCY 'DVP_P4-2: 563T576'      /* MIDLOTHIAN 500 500 KV<br>OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1      /* 8CARSON 500.00 - 8MDLTHAN<br>500.00<br>OPEN BRANCH FROM BUS 314914 TO BUS 314918 CKT 1      /* 8MDLTHAN 500.00 - 8NO ANNA<br>500.00<br>END  |
| <b>DVP_P4-2: 57502</b>        | CONTINGENCY 'DVP_P4-2: 57502'      /* NORTH ANNA 500 KV<br>OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1      /* 8LADYSMITH 500.00 - 8NO ANNA<br>500.00<br>OPEN BRANCH FROM BUS 314232 TO BUS 314918 CKT 1      /* 6NO ANNA 230.00 - 8NO ANNA<br>500.00<br>END     |
| <b>DVP_P1-2: LN 581</b>       | CONTINGENCY 'DVP_P1-2: LN 581'<br>OPEN BRANCH FROM BUS 314135 TO BUS 314905 CKT 2      /* 3CHANCE 115.00 - 8CHANCE 500.00<br>OPEN BRANCH FROM BUS 314905 TO BUS 314911 CKT 1      /* 8CHANCE 500.00 - 8LADYSMITH<br>500.00<br>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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880910 | 314902    | 8CARSON  | DVP           | 314914  | 8MDLTHAN | DVP         | 1      | DVP_P1-2: LN 557 | single | 3218.56    | 119.48                | 119.97                 | DC    | 69.8      |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 314295 | 6BIRDNECK                          | 0.0599    |
| 314491 | 3PENDLTN                           | 0.4472    |
| 314643 | 3O INLET                           | 0.5955    |
| 314947 | 8GREENSVILLE                       | 79.5572   |
| 315099 | 1CHESPKB (Deactivation : 05/31/19) | 4.5038    |
| 315102 | 1BRUNSWICKG1                       | 13.0197   |
| 315103 | 1BRUNSWICKG2                       | 13.0197   |
| 315104 | 1BRUNSWICKG3                       | 13.0197   |
| 315105 | 1BRUNSWICKS1                       | 27.0483   |
| 315108 | 1ELIZAR1                           | 4.3626    |
| 315109 | 1ELIZAR2                           | 4.2868    |
| 315110 | 1ELIZAR3                           | 4.4184    |
| 315233 | 1SURRY 2                           | 34.5162   |
| 315294 | 1DOMTR10                           | 13.8163   |
| 315603 | 6AA1-139SOLA                       | 3.3481    |
| 923262 | AB1-132 C OP                       | 16.6933   |
| 923263 | AB1-132 E OP                       | 7.1543    |
| 923801 | AB2-015 C OP                       | 10.8558   |
| 923831 | AB2-022 C                          | 3.1065    |
| 924241 | AB2-068 OP                         | 310.6012  |
| 924501 | AB2-099 C                          | 0.7281    |
| 924511 | AB2-100 C                          | 13.4345   |
| 925061 | AB2-161 C O1                       | 3.7736    |
| 925121 | AB2-169 C                          | 8.1128    |
| 926071 | AC1-086 C                          | 24.5829   |
| 926291 | AC1-107 O1                         | 468.8320  |
| 926661 | AC1-147 C                          | 3.0437    |
| 926751 | AC1-161 C O1                       | 52.0629   |
| 932041 | AC2-012 C                          | 13.7690   |
| 932591 | AC2-079 C O1                       | 6.8459    |
| 932631 | AC2-084 C                          | 8.4862    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 933291       | AC2-141 C    | 52.0629          |
| 933731       | AC2-196 C    | 2.8836           |
| 933991       | AD1-023 C    | 16.7926          |
| 934061       | AD1-033 C    | 12.0989          |
| 934521       | AD1-076 C    | 69.8961          |
| 934571       | AD1-082 C    | 8.5999           |
| 934611       | AD1-087 C O1 | 10.1500          |
| 935111       | AD1-144 C    | 2.2048           |
| 935171       | AD1-152 C O1 | 10.0870          |
| 936401       | AD2-051 C O1 | 11.0366          |
| 936661       | AD2-085 C    | 4.0955           |
| 936711       | AD2-090 C O1 | 8.9668           |
| 937221       | AD2-160 C O1 | 9.3926           |
| 937251       | AD2-164      | 5.2902           |
| 937481       | AD2-202 C O1 | 2.6899           |
| 937541       | AD2-215 C    | 2.2275           |
| 938171       | AE1-026 C O1 | 40.8412          |
| 938181       | AE1-027 C    | 3.7681           |
| 938191       | AE1-028 C    | 2.1861           |
| 938221       | AE1-035 C    | 2.8269           |
| 938491       | AE1-068 C O1 | 113.9686         |
| 938501       | AE1-069 C O1 | 88.9910          |
| 938531       | AE1-072 C O1 | 28.0724          |
| 938661       | AE1-088      | 4.1604           |
| 938771       | AE1-103 C O1 | 4.5935           |
| 939311       | AE1-162 C    | 2.5027           |
| 939411       | AE1-173 C    | 166.5312         |
| 940061       | AE2-000BC O1 | 17.8750          |
| 940251       | AE2-007 O1   | 276.2498         |
| 940471       | AE2-031 C    | 62.1441          |
| 940481       | AE2-033 C    | 18.1590          |
| 940491       | AE2-034 C    | 5.7859           |
| 940521       | AE2-037 C    | 10.0905          |
| 940541       | AE2-040 O1   | 1.9129           |
| 940641       | AE2-051 C O1 | 32.9391          |
| 941031       | AE2-094 C    | 74.9277          |
| 941101       | AE2-104 C O1 | 4.5191           |
| 941281       | AE2-122 C O1 | 45.5169          |
| 941291       | AE2-123 C O1 | 46.7773          |
| 941301       | AE2-124 C O1 | 42.5705          |

| Bus #   | Bus                                   | MW Impact |
|---------|---------------------------------------|-----------|
| 941501  | AE2-147 C                             | 21.1691   |
| 941541  | AE2-151 C                             | 1.3508    |
| 941591  | AE2-156 O1                            | 28.4750   |
| 942131  | AE2-225 C                             | 2.8590    |
| 942171  | AE2-229 C                             | 2.8590    |
| 942341  | AE2-247 C                             | 0.9397    |
| 942401  | AE2-253 C                             | 9.8794    |
| 942471  | AE2-260 C O1                          | 16.6016   |
| 942851  | AE2-304 C                             | 0.8395    |
| 942931  | AE2-313 C                             | 67.2871   |
| 943171  | AE2-346 C                             | 0.9261    |
| 943451  | AF1-016 C O2                          | 0.9748    |
| 943461  | AF1-017 C                             | 0.8502    |
| 943611  | AF1-032 C                             | 1.2375    |
| 944011  | AF1-069 C                             | 24.4817   |
| 944051  | AF1-073 C O2                          | 13.4923   |
| 944581  | AF1-123 C O2                          | 69.8041   |
| 944591  | AF1-124 C O2                          | 69.8041   |
| 944601  | AF1-125 C O2                          | 69.8041   |
| 944871  | AF1-152 C                             | 3.7399    |
| 945711  | AF1-236 C O2                          | 139.2734  |
| 945811  | AF1-246 C O2                          | 5.0652    |
| 946011  | AF1-266                               | 8.0563    |
| 946461  | AF1-310 C O1 (Withdrawn : 11/05/2019) | 13.7483   |
| LGEE    | LGEE                                  | 1.8958    |
| CPL     | CPL                                   | 12.0393   |
| WEC     | WEC                                   | 0.9900    |
| CBM-W2  | CBM-W2                                | 42.9729   |
| NY      | NY                                    | 2.1772    |
| CBM-W1  | CBM-W1                                | 36.2290   |
| TVA     | TVA                                   | 9.3254    |
| CBM-S2  | CBM-S2                                | 81.6656   |
| CBM-S1  | CBM-S1                                | 51.4693   |
| MADISON | MADISON                               | 2.8627    |
| MEC     | MEC                                   | 6.2384    |
| AA2-074 | AA2-074                               | 8.2031    |

### 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 |
|----------|-----------|----------|---------------|---------|---------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880843 | 314903    | 8CHCKAHM | DVP           | 314908  | 8ELMONT | DVP         | 1      | DVP_P1-2: LN 563 | single | 2442.12    | 162.2                 | 163.18                 | DC    | 76.27     |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 314295 | 6BIRDNECK                          | 0.0656    |
| 314421 | 6WINCHST                           | 0.2002    |
| 314491 | 3PENDLTN                           | 0.4894    |
| 314507 | 3THOMPSN                           | 0.4919    |
| 315090 | 1YORKTN1 (Deactivation : 09/09/18) | 51.3268   |
| 315091 | 1YORKTN2 (Deactivation : 09/09/18) | 53.2636   |
| 315092 | 1YORKTN3                           | 35.6504   |
| 315098 | 1CHESPKA                           | 0.6505    |
| 315099 | 1CHESPKB (Deactivation : 05/31/19) | 4.9568    |
| 315108 | 1ELIZAR1                           | 4.7917    |
| 315109 | 1ELIZAR2                           | 4.7085    |
| 315110 | 1ELIZAR3                           | 4.8530    |
| 315233 | 1SURRY 2                           | 43.4137   |
| 315260 | 1GOSPORTA                          | 0.5193    |
| 315261 | 1GOSPORTB                          | 0.6633    |
| 315262 | 1GOSPORTC                          | 0.5629    |
| 315294 | 1DOMTR10                           | 13.7122   |
| 315603 | 6AA1-139SOLA                       | 3.6271    |
| 923801 | AB2-015 C OP                       | 11.1677   |
| 923831 | AB2-022 C                          | 3.3405    |
| 924241 | AB2-068 OP                         | 610.0300  |
| 924501 | AB2-099 C                          | 0.7110    |
| 925061 | AB2-161 C O1                       | 4.1633    |
| 925121 | AB2-169 C                          | 7.8887    |
| 925331 | AB2-190 C                          | 23.1774   |
| 925861 | AC1-065 C                          | 4.3075    |
| 926291 | AC1-107 O1                         | 920.8000  |
| 926661 | AC1-147 C                          | 3.9410    |
| 926751 | AC1-161 C O1                       | 57.4840   |
| 926781 | AC1-164 C                          | 54.7782   |
| 927221 | AC1-216 C O1                       | 11.5099   |
| 932041 | AC2-012 C                          | 17.8285   |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 932591       | AC2-079 C O1 | 7.4840           |
| 932831       | AC2-110 C    | 1.7230           |
| 933291       | AC2-141 C    | 57.4840          |
| 933731       | AC2-196 C    | 3.1380           |
| 933991       | AD1-023 C    | 16.8501          |
| 934011       | AD1-025 C    | 19.7853          |
| 934061       | AD1-033 C    | 13.1754          |
| 934141       | AD1-041 C    | 6.8184           |
| 934521       | AD1-076 C    | 70.5967          |
| 934571       | AD1-082 C    | 9.4880           |
| 935111       | AD1-144 C    | 2.4908           |
| 935161       | AD1-151 C O1 | 18.6247          |
| 936041       | AD2-007 C    | 0.9452           |
| 936051       | AD2-008 C    | 3.4446           |
| 936301       | AD2-039 C    | 1.7230           |
| 936401       | AD2-051 C O1 | 10.8437          |
| 936661       | AD2-085 C    | 4.4790           |
| 936711       | AD2-090 C O1 | 9.0735           |
| 937221       | AD2-160 C O1 | 10.1887          |
| 937251       | AD2-164      | 8.5056           |
| 937541       | AD2-215 C    | 2.5165           |
| 938031       | AE1-004 C    | 1.7230           |
| 938171       | AE1-026 C O1 | 40.8251          |
| 938181       | AE1-027 C    | 4.0958           |
| 938191       | AE1-028 C    | 2.3762           |
| 938221       | AE1-035 C    | 2.7820           |
| 938491       | AE1-068 C O1 | 70.4586          |
| 938501       | AE1-069 C O1 | 55.0720          |
| 938531       | AE1-072 C O1 | 30.3688          |
| 938661       | AE1-088      | 4.0455           |
| 938771       | AE1-103 C O1 | 4.7592           |
| 939311       | AE1-162 C    | 2.9813           |
| 939411       | AE1-173 C    | 119.7929         |
| 939421       | AE1-174 C    | 0.6369           |
| 939431       | AE1-175 C    | 4.2354           |
| 939611       | AE1-191 C    | 13.6369          |
| 940061       | AE2-000BC O1 | 19.7209          |
| 940231       | AE2-005 C    | 1.7230           |
| 940251       | AE2-007 O1   | 303.5071         |
| 940471       | AE2-031 C    | 38.4037          |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 940491       | AE2-034 C    | 5.9425           |
| 940521       | AE2-037 C    | 9.8668           |
| 940551       | AE2-041 O1   | 9.3996           |
| 940641       | AE2-051 C O1 | 21.9165          |
| 940891       | AE2-078 C    | 3.1998           |
| 940901       | AE2-079 C    | 3.1998           |
| 940911       | AE2-080 C    | 3.1998           |
| 941031       | AE2-094 C    | 46.2403          |
| 941101       | AE2-104 C O1 | 4.8887           |
| 941281       | AE2-122 C O1 | 49.7643          |
| 941291       | AE2-123 C O1 | 51.1423          |
| 941301       | AE2-124 C O1 | 46.5117          |
| 941501       | AE2-147 C    | 22.6211          |
| 941541       | AE2-151 C    | 1.3151           |
| 941591       | AE2-156 O1   | 31.3210          |
| 941601       | AE2-157 C    | 12.4792          |
| 942131       | AE2-225 C    | 3.1017           |
| 942171       | AE2-229 C    | 3.1017           |
| 942341       | AE2-247 C    | 1.0279           |
| 942401       | AE2-253 C    | 10.7167          |
| 942551       | AE2-270      | 31.0411          |
| 942851       | AE2-304 C    | 0.8909           |
| 942931       | AE2-313 C    | 41.5820          |
| 943171       | AE2-346 C    | 0.9044           |
| 943431       | AF1-014 C    | 0.8651           |
| 943451       | AF1-016 C O2 | 1.0576           |
| 943461       | AF1-017 C    | 0.9300           |
| 943471       | AF1-018      | 4.9818           |
| 943611       | AF1-032 C    | 1.3425           |
| 943621       | AF1-033 C    | 1.6959           |
| 944011       | AF1-069 C    | 8.0075           |
| 944051       | AF1-073 C O2 | 13.3361          |
| 944061       | AF1-074 C O2 | 3.2682           |
| 944501       | AF1-115 C O2 | 5.1626           |
| 944581       | AF1-123 C O2 | 76.2666          |
| 944591       | AF1-124 C O2 | 76.2666          |
| 944601       | AF1-125 C O2 | 76.2666          |
| 944871       | AF1-152 C    | 3.9964           |
| 945361       | AF1-201 C O2 | 28.9629          |
| 945711       | AF1-236 C O2 | 147.4900         |

| <b>Bus #</b>   | <b>Bus</b> | <b>MW Impact</b> |
|----------------|------------|------------------|
| <b>LGEE</b>    | LGEE       | 1.0440           |
| <b>CPL</b>     | CPL        | 9.3318           |
| <b>WEC</b>     | WEC        | 0.5399           |
| <b>CBM-W2</b>  | CBM-W2     | 27.6658          |
| <b>NY</b>      | NY         | 1.8183           |
| <b>CBM-W1</b>  | CBM-W1     | 19.1653          |
| <b>TVA</b>     | TVA        | 6.2832           |
| <b>CBM-S2</b>  | CBM-S2     | 61.3085          |
| <b>CBM-S1</b>  | CBM-S1     | 34.0289          |
| <b>MADISON</b> | MADISON    | 2.2942           |
| <b>MEC</b>     | MEC        | 3.7055           |
| <b>AA2-074</b> | AA2-074    | 6.3540           |

### 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880898 | 314905    | 8CHANCE  | DVP           | 314900  | 8BRISTER | DVP         | 1      | DVP_P1-2: LN 594 | single | 2442.12    | 141.13                | 141.22                 | DC    | 46.45     |

| 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 (Deativation : 12/13/18) | 16.9907   |
| 315059 | 1CHESTF4 (Deativation : 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 (Deativation : 06/25/19) | 7.7801    |
| 315075 | 1HOPCGN2 (Deativation : 06/25/19) | 7.6793    |
| 315083 | 1SPRUNCA (Deativation : 01/12/19) | 9.8906    |
| 315084 | 1SPRUNCB (Deativation : 01/12/19) | 9.8906    |
| 315090 | 1YORKTN1 (Deativation : 09/09/18) | 26.3583   |
| 315091 | 1YORKTN2 (Deativation : 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           |

### 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 |
|----------|-----------|----------|---------------|---------|------------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881003 | 314908    | 8ELMONT  | DVP           | 314911  | 8LADYSMITH | DVP         | 1      | DVP_P1-2: LN 576 | single | 4070.2     | 114.77                | 114.97                 | DC    | 78.73     |

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

### 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 |
|----------|-----------|------------|---------------|---------|---------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880928 | 314911    | 8LADYSMITH | DVP           | 314922  | 8POSSUM | DVP         | 1      | DVP_P1-2: LN 594 | single | 2442.12    | 128.59                | 129.02                 | DC    | 40.02     |

| 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 (Deativation : 12/13/18) | 14.4610   |
| 315059 | 1CHESTF4 (Deativation : 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 (Deativation : 06/25/19) | 6.6486    |
| 315075 | 1HOPCGN2 (Deativation : 06/25/19) | 6.5625    |
| 315083 | 1SPRUNCA (Deativation : 01/12/19) | 9.9482    |
| 315084 | 1SPRUNCB (Deativation : 01/12/19) | 9.9482    |
| 315090 | 1YORKTN1 (Deativation : 09/09/18) | 22.5417   |
| 315091 | 1YORKTN2 (Deativation : 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> |
|----------------|--------------|------------------|
| <b>942341</b>  | AE2-247 C    | 0.6165           |
| <b>942371</b>  | AE2-250 C O1 | 7.6809           |
| <b>942401</b>  | AE2-253 C    | 4.7923           |
| <b>942551</b>  | AE2-270      | 21.3703          |
| <b>942851</b>  | AE2-304 C    | 0.4853           |
| <b>942931</b>  | AE2-313 C    | 25.2749          |
| <b>943431</b>  | AF1-014 C    | 0.5238           |
| <b>943451</b>  | AF1-016 C O2 | 0.5658           |
| <b>943461</b>  | AF1-017 C    | 0.5578           |
| <b>943471</b>  | AF1-018      | 2.9290           |
| <b>943611</b>  | AF1-032 C    | 0.7183           |
| <b>943621</b>  | AF1-033 C    | 0.9893           |
| <b>944011</b>  | AF1-069 C    | 4.8362           |
| <b>944061</b>  | AF1-074 C O2 | 3.0254           |
| <b>944501</b>  | AF1-115 C O2 | 3.0130           |
| <b>944581</b>  | AF1-123 C O2 | 18.0298          |
| <b>944591</b>  | AF1-124 C O2 | 18.0298          |
| <b>944601</b>  | AF1-125 C O2 | 18.0298          |
| <b>944631</b>  | AF1-128 O2   | 23.5219          |
| <b>944641</b>  | AF1-129 O2   | 43.3795          |
| <b>944871</b>  | AF1-152 C    | 2.1613           |
| <b>945361</b>  | AF1-201 C O2 | 6.7524           |
| <b>945711</b>  | AF1-236 C O2 | 34.1512          |
| <b>946001</b>  | AF1-265      | 26.2740          |
| <b>946011</b>  | AF1-266      | 5.2703           |
| <b>946261</b>  | AF1-291 C    | 0.9127           |
| <b>LGEE</b>    | LGEE         | 1.8878           |
| <b>CPL</b>     | CPL          | 6.8961           |
| <b>WEC</b>     | WEC          | 0.9759           |
| <b>CBM-W2</b>  | CBM-W2       | 35.1105          |
| <b>NY</b>      | NY           | 2.7130           |
| <b>CBM-W1</b>  | CBM-W1       | 36.2039          |
| <b>TVA</b>     | TVA          | 7.1638           |
| <b>CBM-S2</b>  | CBM-S2       | 50.0317          |
| <b>CBM-S1</b>  | CBM-S1       | 40.7341          |
| <b>MADISON</b> | MADISON      | 1.4818           |
| <b>MEC</b>     | MEC          | 5.6330           |
| <b>AA2-074</b> | AA2-074      | 4.7061           |

### 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 |
|----------|-----------|------------|---------------|---------|---------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880940 | 314911    | 8LADYSMITH | DVP           | 314905  | 8CHANCE | DVP         | 1      | DVP_P1-2: LN 573 | single | 2738.22    | 127.38                | 127.46                 | DC    | 47.23     |

| 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           |

| <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           |

### 13.5.8 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880863 | 314914    | 8MDLTHAN | DVP           | 314918  | 8NO ANNA | DVP         | 1      | DVP_P1-2: LN 574 | single | 2442.12    | 149.16                | 149.62                 | DC    | 67.98     |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 314295 | 6BIRDNECK                          | 0.0584    |
| 314491 | 3PENDLTN                           | 0.4363    |
| 314507 | 3THOMPSON                          | 0.4390    |
| 314947 | 8GREENSVILLE                       | 70.1242   |
| 315058 | 1CHESTF3 (Deactivation : 12/13/18) | 20.5130   |
| 315059 | 1CHESTF4 (Deactivation : 12/13/18) | 33.2517   |
| 315074 | 1HOPCGN1 (Deactivation : 06/25/19) | 9.9214    |
| 315075 | 1HOPCGN2 (Deactivation : 06/25/19) | 9.7928    |
| 315083 | 1SPRUNCA (Deactivation : 01/12/19) | 13.1478   |
| 315084 | 1SPRUNCB (Deactivation : 01/12/19) | 13.1478   |
| 315090 | 1YORKTN1 (Deactivation : 09/09/18) | 34.8809   |
| 315091 | 1YORKTN2 (Deactivation : 09/09/18) | 36.1971   |
| 315098 | 1CHESPKA                           | 0.5801    |
| 315099 | 1CHESPKB (Deactivation : 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          |

| Bus #   | Bus                                   | MW Impact |
|---------|---------------------------------------|-----------|
| 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    |

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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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881042 | 314916    | 8MORRSVL | DVP           | 314913  | 8LOUDOUN | DVP         | 1      | DVP_P1-2: LN 580 | single | 2738.22    | 105.69                | 106.04                 | DC    | 30.1      |

| 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 |
|----------|-----------|----------|---------------|---------|------------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880988 | 314918    | 8NO ANNA | DVP           | 314911  | 8LADYSMITH | DVP         | 1      | DVP_P1-2: LN 573 | single | 3218.56    | 107.55                | 108.6                  | DC    | 33.5      |

| Bus #  | Bus                                 | MW Impact |
|--------|-------------------------------------|-----------|
| 314295 | 6BIRDNECK                           | 0.0288    |
| 314333 | 6POWHATN                            | 0.3398    |
| 314435 | 6SAPONY                             | 0.2829    |
| 314947 | 8GREENSVILLE                        | 43.3131   |
| 315102 | 1BRUNSWICKG1                        | 7.1073    |
| 315103 | 1BRUNSWICKG2                        | 7.1073    |
| 315104 | 1BRUNSWICKG3                        | 7.1073    |
| 315105 | 1BRUNSWICKS1                        | 14.7654   |
| 315131 | 1EDGECSMA (Deactivation : 04/22/19) | 6.1260    |
| 315132 | 1EDGECSMB (Deactivation : 04/22/19) | 6.1260    |
| 315153 | 1CLOVER1                            | 10.0481   |
| 315154 | 1CLOVER2                            | 9.9480    |
| 315172 | 1LOISA A                            | 2.4389    |
| 315173 | 1LOISA B                            | 2.4515    |
| 315174 | 1LOISA C                            | 2.4515    |
| 315175 | 1LOISA D                            | 2.4515    |
| 315176 | 1LOISA E                            | 4.9979    |
| 315177 | 1S ANNAG1                           | 1.7863    |
| 315178 | 1S ANNAS1                           | 0.9180    |
| 315179 | 1S ANNAG2                           | 1.7863    |
| 315180 | 1S ANNAS2                           | 0.9180    |
| 315225 | 1N ANNA1                            | 91.4291   |
| 315226 | 1N ANNA2                            | 91.4675   |
| 315294 | 1DOMTR10                            | 7.2270    |
| 315603 | 6AA1-139SOLA                        | 1.6132    |
| 922922 | AB1-081 C OP                        | 5.9157    |
| 923262 | AB1-132 C OP                        | 9.5583    |
| 923263 | AB1-132 E OP                        | 4.0964    |
| 923572 | AB1-173 C OP                        | 1.5552    |
| 923582 | AB1-173AC OP                        | 1.5552    |
| 923801 | AB2-015 C OP                        | 5.7044    |
| 923831 | AB2-022 C                           | 1.5122    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 923911       | AB2-031 C O1 | 1.5437           |
| 923991       | AB2-040 C O1 | 5.0688           |
| 924021       | AB2-043 C O1 | 2.1240           |
| 924151       | AB2-059 C OP | 6.9721           |
| 924161       | AB2-060 C OP | 6.1199           |
| 924301       | AB2-077 C O1 | 1.3464           |
| 924311       | AB2-078 C O1 | 1.3464           |
| 924321       | AB2-079 C O1 | 1.3464           |
| 924501       | AB2-099 C    | 0.3930           |
| 924511       | AB2-100 C    | 9.3880           |
| 925021       | AB2-158 C    | 24.8965          |
| 925061       | AB2-161 C O1 | 2.1136           |
| 925121       | AB2-169 C    | 4.2972           |
| 925171       | AB2-174 C O1 | 4.8598           |
| 925591       | AC1-034 C    | 4.5160           |
| 925611       | AC1-036 C    | 0.6519           |
| 925781       | AC1-054 C O1 | 4.9120           |
| 926071       | AC1-086 C    | 14.0758          |
| 926201       | AC1-098 C    | 4.1289           |
| 926211       | AC1-099 C    | 1.3836           |
| 926271       | AC1-105 C O1 | 3.7753           |
| 926661       | AC1-147 C    | 1.4645           |
| 926751       | AC1-161 C O1 | 23.3949          |
| 927021       | AC1-189 C    | 5.6996           |
| 927141       | AC1-208 C    | 6.0727           |
| 927261       | AC1-222 C    | 2.4104           |
| 932041       | AC2-012 C    | 6.6251           |
| 932511       | AC2-071 C    | 1.5504           |
| 932581       | AC2-078 C O1 | 2.4496           |
| 932591       | AC2-079 C O1 | 3.6482           |
| 932631       | AC2-084 C    | 5.8859           |
| 933291       | AC2-141 C    | 23.3949          |
| 933501       | AC2-165 C    | 9.6131           |
| 933731       | AC2-196 C    | 1.3806           |
| 933991       | AD1-023 C    | 8.7483           |
| 934061       | AD1-033 C    | 5.7952           |
| 934201       | AD1-047 C    | 5.5296           |
| 934311       | AD1-055 C    | 1.6736           |
| 934331       | AD1-057 C O1 | 6.6934           |
| 934521       | AD1-076 C    | 36.1597          |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 934571 | AD1-082 C                          | 4.8167    |
| 934611 | AD1-087 C O1                       | 7.2788    |
| 934621 | AD1-088 C                          | 10.6136   |
| 935111 | AD1-144 C                          | 1.0854    |
| 935171 | AD1-152 C O1                       | 7.2336    |
| 935211 | AD1-156 C                          | 1.3235    |
| 935221 | AD1-157 C                          | 1.0500    |
| 935231 | AD1-160 C                          | 0.7700    |
| 936261 | AD2-033 C                          | 8.8928    |
| 936331 | AD2-043 C (Withdrawn : 12/20/2019) | 3.1370    |
| 936361 | AD2-046 C O1                       | 6.0284    |
| 936401 | AD2-051 C O1                       | 5.8775    |
| 936481 | AD2-063 C O1                       | 10.1829   |
| 936661 | AD2-085 C                          | 2.1874    |
| 936701 | AD2-089 C (Withdrawn : 12/09/2019) | 4.7809    |
| 936711 | AD2-090 C O1                       | 4.7781    |
| 937221 | AD2-160 C O1                       | 4.5175    |
| 937481 | AD2-202 C O1                       | 1.9290    |
| 937541 | AD2-215 C                          | 1.0966    |
| 937571 | AD2-169 C                          | 6.8784    |
| 938171 | AE1-026 C O1                       | 21.3617   |
| 938181 | AE1-027 C                          | 1.8070    |
| 938191 | AE1-028 C                          | 1.0483    |
| 938221 | AE1-035 C                          | 1.5023    |
| 938371 | AE1-056 C                          | 4.5268    |
| 938491 | AE1-068 C O1                       | 61.9269   |
| 938501 | AE1-069 C O1                       | 48.4492   |
| 938531 | AE1-072 C O1                       | 13.5526   |
| 938551 | AE1-074 C                          | 2.0377    |
| 938561 | AE1-075 C                          | 2.1347    |
| 938631 | AE1-085 C O1                       | 5.3996    |
| 938661 | AE1-088                            | 2.2037    |
| 938771 | AE1-103 C O1                       | 2.3989    |
| 939181 | AE1-148 C O1                       | 5.9468    |
| 939191 | AE1-149 C O1                       | 6.4051    |
| 939231 | AE1-154 C                          | 4.0814    |
| 939311 | AE1-162 C                          | 1.2822    |
| 939371 | AE1-168 C                          | 10.3948   |
| 939411 | AE1-173 C                          | 85.6032   |
| 940061 | AE2-000BC O1                       | 10.0116   |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 940241       | AE2-006      | 0.3317           |
| 940251       | AE2-007 O1   | 112.7510         |
| 940471       | AE2-031 C    | 33.8378          |
| 940481       | AE2-033 C    | 12.9940          |
| 940491       | AE2-034 C    | 2.9496           |
| 940521       | AE2-037 C    | 5.3773           |
| 940541       | AE2-040 O1   | 2.5910           |
| 940571       | AE2-044 C    | 1.5677           |
| 940641       | AE2-051 C O1 | 17.2521          |
| 940651       | AE2-052      | 1.1316           |
| 940661       | AE2-053 O1   | 2.2025           |
| 941031       | AE2-094 C    | 40.5698          |
| 941101       | AE2-104 C O1 | 2.2691           |
| 941281       | AE2-122 C O1 | 21.8472          |
| 941291       | AE2-123 C O1 | 22.4521          |
| 941301       | AE2-124 C O1 | 20.4277          |
| 941501       | AE2-147 C    | 10.4132          |
| 941541       | AE2-151 C    | 0.7284           |
| 941591       | AE2-156 O1   | 11.6348          |
| 941601       | AE2-157 C    | 6.5836           |
| 941791       | AE2-182 C    | 2.0216           |
| 942131       | AE2-225 C    | 1.3950           |
| 942171       | AE2-229 C    | 1.3950           |
| 942341       | AE2-247 C    | 0.5024           |
| 942401       | AE2-253 C    | 4.7517           |
| 942451       | AE2-258      | 1.5845           |
| 942461       | AE2-259 C O1 | 8.3514           |
| 942471       | AE2-260 C O1 | 11.6533          |
| 942851       | AE2-304 C    | 0.4153           |
| 942931       | AE2-313 C    | 36.6381          |
| 943171       | AE2-346 C    | 0.4999           |
| 943451       | AF1-016 C O2 | 0.4756           |
| 943461       | AF1-017 C    | 0.4545           |
| 943611       | AF1-032 C    | 0.6038           |
| 943901       | AF1-058 C    | 0.7027           |
| 943911       | AF1-059      | 6.0673           |
| 944011       | AF1-069 C    | 13.2557          |
| 944051       | AF1-073 C O2 | 7.0754           |
| 944061       | AF1-074 C O2 | 2.3543           |
| 944111       | AF1-079 C    | 7.7547           |

| Bus #   | Bus                                   | MW Impact |
|---------|---------------------------------------|-----------|
| 944141  | AF1-082                               | 1.0078    |
| 944581  | AF1-123 C O2                          | 33.4959   |
| 944591  | AF1-124 C O2                          | 33.4959   |
| 944601  | AF1-125 C O2                          | 33.4959   |
| 944871  | AF1-152 C                             | 1.8397    |
| 945711  | AF1-236 C O2                          | 65.9399   |
| 945811  | AF1-246 C O2                          | 6.8481    |
| 946011  | AF1-266                               | 10.8770   |
| 946281  | AF1-292 C                             | 1.2258    |
| 946301  | AF1-294 C                             | 1.8457    |
| 946371  | AF1-301 C                             | 36.8780   |
| 946461  | AF1-310 C O1 (Withdrawn : 11/05/2019) | 18.5877   |
| LGEE    | LGEE                                  | 1.0697    |
| CPL     | CPL                                   | 6.9266    |
| WEC     | WEC                                   | 0.5405    |
| CBM-W2  | CBM-W2                                | 24.7256   |
| NY      | NY                                    | 2.2220    |
| CBM-W1  | CBM-W1                                | 19.2279   |
| TVA     | TVA                                   | 5.4712    |
| CBM-S2  | CBM-S2                                | 47.5174   |
| CBM-S1  | CBM-S1                                | 30.0841   |
| MADISON | MADISON                               | 1.7136    |
| MEC     | MEC                                   | 3.5006    |
| AA2-074 | AA2-074                               | 4.7191    |

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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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881020 | 314918    | 8NO ANNA | DVP           | 314934  | 8SPOTSYL | DVP         | 1      | DVP_P1-2: LN 581 | single | 3218.56    | 115.05                | 115.09                 | DC    | 51.11     |

| 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> |
|---------------|--------------|------------------|
| <b>932041</b> | AC2-012 C    | 10.1876          |
| <b>932501</b> | AC2-070 C    | 1.6271           |
| <b>932581</b> | AC2-078 C O1 | 4.0586           |
| <b>932591</b> | AC2-079 C O1 | 5.6900           |
| <b>933261</b> | AC2-137 C    | 2.0212           |
| <b>933291</b> | AC2-141 C    | 35.7913          |
| <b>933731</b> | AC2-196 C    | 1.7828           |
| <b>934011</b> | AD1-025 C    | 16.8075          |
| <b>934061</b> | AD1-033 C    | 7.4888           |
| <b>934571</b> | AD1-082 C    | 7.6529           |
| <b>935111</b> | AD1-144 C    | 1.7150           |
| <b>935161</b> | AD1-151 C O1 | 16.0604          |
| <b>935211</b> | AD1-156 C    | 2.5029           |
| <b>936041</b> | AD2-007 C    | 0.8029           |
| <b>936051</b> | AD2-008 C    | 2.9261           |
| <b>936151</b> | AD2-021      | 0.2305           |
| <b>936661</b> | AD2-085 C    | 3.4147           |
| <b>936761</b> | AD2-097 C    | 2.3812           |
| <b>937221</b> | AD2-160 C O1 | 5.8183           |
| <b>937251</b> | AD2-164      | 4.7369           |
| <b>937541</b> | AD2-215 C    | 1.7327           |
| <b>938181</b> | AE1-027 C    | 2.3312           |
| <b>938191</b> | AE1-028 C    | 1.3525           |
| <b>938491</b> | AE1-068 C O1 | 57.1526          |
| <b>938501</b> | AE1-069 C O1 | 36.0621          |
| <b>938531</b> | AE1-072 C O1 | 17.4166          |
| <b>938551</b> | AE1-074 C    | 2.9559           |
| <b>938631</b> | AE1-085 C O1 | 8.8910           |
| <b>939191</b> | AE1-149 C O1 | 10.6942          |
| <b>939311</b> | AE1-162 C    | 2.1413           |
| <b>939411</b> | AE1-173 C    | 103.7328         |
| <b>939421</b> | AE1-174 C    | 0.3546           |
| <b>939431</b> | AE1-175 C    | 2.3578           |
| <b>940061</b> | AE2-000BC O1 | 15.9066          |
| <b>940071</b> | AE1-249 C    | 8.4415           |
| <b>940251</b> | AE2-007 O1   | 203.5540         |
| <b>940431</b> | AE2-027 C O1 | 15.1452          |
| <b>940471</b> | AE2-031 C    | 36.6775          |
| <b>940641</b> | AE2-051 C O1 | 19.6398          |
| <b>940651</b> | 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42881058 | 314919    | 80X      | DVP           | 314904  | 8CLIFTON | DVP         | 1      | DVP_P1-2: LN 569 | single | 2442.12    | 103.63                | 103.67                 | DC    | 27.86     |

| Bus #  | Bus                               | MW Impact |
|--------|-----------------------------------|-----------|
| 314131 | 6ARNOLDS                          | 0.1721    |
| 314134 | 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   |
| 315008 | 1POSSM6A                          | 2.9757    |
| 315009 | 1POSSM6B                          | 2.9757    |
| 315010 | 1POSSM6S                          | 4.6370    |
| 315033 | 1BIRCHWDA                         | 4.5390    |
| 315037 | 1LDYSMT1                          | 3.1029    |
| 315038 | 1LDYSMT2                          | 3.1009    |
| 315039 | 1LDYSMT3                          | 3.2816    |
| 315040 | 1LDYSMT4                          | 3.2877    |
| 315041 | 1LDYSMT5                          | 3.2980    |
| 315043 | 1FOUR RIVERA                      | 1.7818    |
| 315044 | 1FOUR RIVERB                      | 1.7818    |
| 315045 | 1FOUR RIVERC                      | 2.1859    |
| 315046 | 1FOUR RIVERD                      | 1.7818    |
| 315047 | 1FOUR RIVERE                      | 1.7818    |
| 315048 | 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   |
| 315225 | 1N ANNA1                          | 19.4117   |
| 315226 | 1N ANNA2                          | 19.4199   |
| 315610 | 6AA1-145GAS                       | 6.2455    |
| 924061 | AB2-050                           | 0.3674    |
| 924241 | AB2-068 OP                        | 111.6699  |
| 925021 | 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> |
|---------------|--------------|------------------|
| <b>941301</b> | AE2-124 C O1 | 7.6553           |
| <b>941381</b> | AE2-134      | 1.8079           |
| <b>941581</b> | AE2-155 C    | 0.3709           |
| <b>941591</b> | AE2-156 O1   | 9.7580           |
| <b>941601</b> | AE2-157 C    | 5.8619           |
| <b>941831</b> | AE2-188      | 3.8593           |
| <b>942001</b> | AE2-212 C    | 1.2066           |
| <b>942151</b> | AE2-227 C    | 1.2495           |
| <b>942161</b> | AE2-228 C    | 1.2187           |
| <b>942191</b> | AE2-231 C O1 | 4.2003           |
| <b>942341</b> | AE2-247 C    | 0.4298           |
| <b>942371</b> | AE2-250 C O1 | 5.4318           |
| <b>942401</b> | AE2-253 C    | 3.3325           |
| <b>942551</b> | AE2-270      | 15.0935          |
| <b>943431</b> | AF1-014 C    | 0.3976           |
| <b>943461</b> | AF1-017 C    | 0.3889           |
| <b>943471</b> | AF1-018      | 2.2091           |
| <b>943601</b> | AF1-031 C    | 4.1433           |
| <b>943621</b> | AF1-033 C    | 0.6965           |
| <b>943741</b> | AF1-042 C    | 0.9681           |
| <b>943991</b> | AF1-067 C    | 1.7409           |
| <b>944061</b> | AF1-074 C O2 | 2.1194           |
| <b>944111</b> | AF1-079 C    | 1.0190           |
| <b>944491</b> | AF1-114 C    | 5.5541           |
| <b>944501</b> | AF1-115 C O2 | 2.1209           |
| <b>944581</b> | AF1-123 C O2 | 12.5526          |
| <b>944591</b> | AF1-124 C O2 | 12.5526          |
| <b>944601</b> | AF1-125 C O2 | 12.5526          |
| <b>944631</b> | AF1-128 O2   | 16.8592          |
| <b>944641</b> | AF1-129 O2   | 30.7319          |
| <b>945361</b> | AF1-201 C O2 | 4.8042           |
| <b>945711</b> | AF1-236 C O2 | 23.7465          |
| <b>945831</b> | AF1-248      | 0.1207           |
| <b>946001</b> | AF1-265      | 8.8023           |
| <b>946261</b> | AF1-291 C    | 0.6460           |
| <b>946371</b> | AF1-301 C    | 4.7977           |
| <b>LGEE</b>   | LGEE         | 0.3994           |
| <b>CPL</b>    | CPL          | 4.3044           |
| <b>WEC</b>    | WEC          | 0.1685           |
| <b>CBM-W2</b> | CBM-W2       | 12.2850          |

| <b>Bus #</b>   | <b>Bus</b> | <b>MW Impact</b> |
|----------------|------------|------------------|
| <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           |

| 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|-----------------|---------|------------|-----------------------|------------------------|-------|-----------|
| 42880718 | 314924    | 8SURREY  | DVP           | 314903  | 8CHCKAHM | DVP         | 1      | DVP_P4-2: 56372 | breaker | 3144.0     | 112.34                | 114.39                 | DC    | 271.37    |

| Bus #  | Bus          | MW Impact |
|--------|--------------|-----------|
| 314295 | 6BIRDNECK    | 0.0645    |
| 314491 | 3PENDLTN     | 0.4808    |
| 315108 | 1ELIZAR1     | 4.7011    |
| 315109 | 1ELIZAR2     | 4.6195    |
| 315110 | 1ELIZAR3     | 4.7613    |
| 315233 | 1SURREY 2    | 46.5632   |
| 901082 | W1-029 E     | 63.0875   |
| 913392 | Y1-086 E     | 3.1027    |
| 916192 | Z1-068 E     | 3.2335    |
| 917122 | Z2-027 E     | 1.4813    |
| 919152 | AA1-139 E    | 9.3146    |
| 923831 | AB2-022 C    | 3.2528    |
| 923832 | AB2-022 E    | 1.7515    |
| 925522 | AC1-027 E    | 1.9683    |
| 926661 | AC1-147 C    | 3.2708    |
| 926662 | AC1-147 E    | 1.9210    |
| 926751 | AC1-161 C O1 | 61.2568   |
| 926752 | AC1-161 E O1 | 26.1488   |
| 932041 | AC2-012 C    | 14.7966   |
| 932042 | AC2-012 E    | 24.1419   |
| 933291 | AC2-141 C    | 61.2568   |
| 933292 | AC2-141 E    | 26.1488   |
| 933731 | AC2-196 C    | 3.1076    |
| 933732 | AC2-196 E    | 2.0697    |
| 934061 | AD1-033 C    | 13.0347   |
| 934062 | AD1-033 E    | 8.6898    |
| 937221 | AD2-160 C O1 | 10.0443   |
| 937222 | AD2-160 E O1 | 5.2672    |
| 938181 | AE1-027 C    | 4.0497    |
| 938182 | AE1-027 E    | 2.1331    |
| 938191 | AE1-028 C    | 2.3495    |
| 938192 | AE1-028 E    | 1.3602    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 938531       | AE1-072 C O1 | 25.3517          |
| 938532       | AE1-072 E O1 | 13.2158          |
| 939411       | AE1-173 C    | 150.3024         |
| 939412       | AE1-173 E    | 100.2016         |
| 940251       | AE2-007 O1   | 297.5854         |
| 940471       | AE2-031 C    | 8.2293           |
| 940472       | AE2-031 E    | 5.4862           |
| 940641       | AE2-051 C O1 | 28.1808          |
| 940642       | AE2-051 E O1 | 18.7872          |
| 941031       | AE2-094 C    | 50.6750          |
| 941032       | AE2-094 E    | 22.6961          |
| 941281       | AE2-122 C O1 | 48.9587          |
| 941282       | AE2-122 E O1 | 197.5601         |
| 941291       | AE2-123 C O1 | 50.3144          |
| 941292       | AE2-123 E O1 | 196.2044         |
| 941301       | AE2-124 C O1 | 45.7929          |
| 941302       | AE2-124 E O1 | 200.9339         |
| 941501       | AE2-147 C    | 21.7543          |
| 941502       | AE2-147 E    | 14.5029          |
| 941591       | AE2-156 O1   | 30.6360          |
| 942131       | AE2-225 C    | 2.9813           |
| 942132       | AE2-225 E    | 1.9875           |
| 942171       | AE2-229 C    | 2.9813           |
| 942172       | AE2-229 E    | 1.9875           |
| 942401       | AE2-253 C    | 10.5649          |
| 942402       | AE2-253 E    | 4.7466           |
| 942931       | AE2-313 C    | 45.5118          |
| 942932       | AE2-313 E    | 30.3412          |
| 943451       | AF1-016 C O2 | 1.0165           |
| 943452       | AF1-016 E O2 | 1.6169           |
| 943611       | AF1-032 C    | 1.2904           |
| 943612       | AF1-032 E    | 0.6847           |
| 944011       | AF1-069 C    | 8.7754           |
| 944012       | AF1-069 E    | 3.4091           |
| 944581       | AF1-123 C O2 | 75.0881          |
| 944582       | AF1-123 E O2 | 196.2775         |
| 944591       | AF1-124 C O2 | 75.0881          |
| 944592       | AF1-124 E O2 | 196.2775         |
| 944601       | AF1-125 C O2 | 75.0881          |
| 944602       | AF1-125 E O2 | 196.2775         |

| <b>Bus #</b>   | <b>Bus</b>   | <b>MW Impact</b> |
|----------------|--------------|------------------|
| <b>944871</b>  | AF1-152 C    | 3.8433           |
| <b>944872</b>  | AF1-152 E    | 2.5622           |
| <b>945711</b>  | AF1-236 C O2 | 151.3294         |
| <b>945712</b>  | AF1-236 E O2 | 246.9058         |
| <b>LGEE</b>    | LGEE         | 1.2967           |
| <b>CPL</b>     | CPL          | 9.3926           |
| <b>WEC</b>     | WEC          | 0.6779           |
| <b>CBM-W2</b>  | CBM-W2       | 31.1302          |
| <b>NY</b>      | NY           | 1.6502           |
| <b>CBM-W1</b>  | CBM-W1       | 24.6072          |
| <b>TVA</b>     | TVA          | 6.8642           |
| <b>O-066</b>   | O-066        | 22.3171          |
| <b>CBM-S2</b>  | CBM-S2       | 62.9211          |
| <b>CBM-S1</b>  | CBM-S1       | 37.6158          |
| <b>G-007</b>   | G-007        | 3.4830           |
| <b>MADISON</b> | MADISON      | 2.2660           |
| <b>MEC</b>     | MEC          | 4.3920           |
| <b>AA2-074</b> | AA2-074      | 6.3976           |

| 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 |
|----------|-----------|----------|---------------|---------|----------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880954 | 314934    | 8SPOTSYL | DVP           | 314916  | 8MORRSVL | DVP         | 1      | DVP_P1-2: LN 552 | single | 3218.56    | 119.85                | 119.87                 | DC    | 50.47     |

| 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    |
| 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 | 1SURREY 2                          | 24.5743   |
| 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   |
| 926001 | AC1-076 C                          | 6.1102    |
| 926291 | AC1-107 O1                         | 279.9968  |
| 926661 | AC1-147 C                          | 2.2238    |

| <b>Bus #</b> | <b>Bus</b>   | <b>MW Impact</b> |
|--------------|--------------|------------------|
| 926731       | AC1-158 C    | 184.7658         |
| 926751       | AC1-161 C O1 | 35.3388          |
| 926781       | AC1-164 C    | 23.7000          |
| 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           |
| 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           |
| 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          |
| 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           |
| 939431       | AE1-175 C    | 2.3287           |
| 940061       | AE2-000BC O1 | 15.7116          |
| 940071       | AE1-249 C    | 8.3384           |
| 940251       | AE2-007 O1   | 201.0092         |
| 940431       | AE2-027 C O1 | 14.9616          |
| 940471       | AE2-031 C    | 36.2216          |

| <b>Bus #</b>  | <b>Bus</b>   | <b>MW Impact</b> |
|---------------|--------------|------------------|
| <b>940641</b> | AE2-051 C O1 | 19.3833          |
| <b>940651</b> | AE2-052      | 1.8662           |
| <b>940891</b> | AE2-078 C    | 2.3218           |
| <b>940901</b> | AE2-079 C    | 2.3218           |
| <b>940911</b> | AE2-080 C    | 2.3218           |
| <b>941031</b> | AE2-094 C    | 43.3877          |
| <b>941281</b> | AE2-122 C O1 | 14.8402          |
| <b>941291</b> | AE2-123 C O1 | 15.2511          |
| <b>941301</b> | AE2-124 C O1 | 13.8662          |
| <b>941381</b> | AE2-134      | 4.2104           |
| <b>941581</b> | AE2-155 C    | 0.6115           |
| <b>941591</b> | AE2-156 O1   | 17.6553          |
| <b>941601</b> | AE2-157 C    | 10.5045          |
| <b>942001</b> | AE2-212 C    | 2.5002           |
| <b>942131</b> | AE2-225 C    | 2.0916           |
| <b>942151</b> | AE2-227 C    | 2.5075           |
| <b>942161</b> | AE2-228 C    | 2.5016           |
| <b>942171</b> | AE2-229 C    | 2.0916           |
| <b>942371</b> | AE2-250 C O1 | 11.2288          |
| <b>942401</b> | AE2-253 C    | 6.0436           |
| <b>942551</b> | AE2-270      | 26.4397          |
| <b>942931</b> | AE2-313 C    | 39.2192          |
| <b>943451</b> | AF1-016 C O2 | 0.7132           |
| <b>943611</b> | AF1-032 C    | 0.9053           |
| <b>943621</b> | AF1-033 C    | 1.2305           |
| <b>944011</b> | AF1-069 C    | 14.1764          |
| <b>944061</b> | AF1-074 C O2 | 3.7919           |
| <b>944111</b> | AF1-079 C    | 3.9932           |
| <b>944501</b> | AF1-115 C O2 | 3.7477           |
| <b>944581</b> | AF1-123 C O2 | 22.7368          |
| <b>944591</b> | AF1-124 C O2 | 22.7368          |
| <b>944601</b> | AF1-125 C O2 | 22.7368          |
| <b>944631</b> | AF1-128 O2   | 28.6997          |
| <b>944641</b> | AF1-129 O2   | 118.6479         |
| <b>945361</b> | AF1-201 C O2 | 8.3450           |
| <b>945711</b> | AF1-236 C O2 | 96.0154          |
| <b>946261</b> | AF1-291 C    | 2.5016           |
| <b>946371</b> | AF1-301 C    | 19.0060          |
| <b>LGEE</b>   | LGEE         | 1.3327           |
| <b>CPL</b>    | CPL          | 8.2859           |

| <b>Bus #</b>   | <b>Bus</b> | <b>MW Impact</b> |
|----------------|------------|------------------|
| <b>WEC</b>     | WEC        | 0.6558           |
| <b>CBM-W2</b>  | CBM-W2     | 30.4750          |
| <b>NY</b>      | NY         | 2.7805           |
| <b>CBM-W1</b>  | CBM-W1     | 22.9684          |
| <b>TVA</b>     | TVA        | 6.8026           |
| <b>CBM-S2</b>  | CBM-S2     | 57.4185          |
| <b>CBM-S1</b>  | CBM-S1     | 37.4028          |
| <b>MADISON</b> | MADISON    | 2.0987           |
| <b>MEC</b>     | MEC        | 4.2871           |
| <b>AA2-074</b> | AA2-074    | 5.6453           |

| 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 |
|----------|-----------|-------------|---------------|---------|--------------|-------------|--------|------------------|--------|------------|-----------------------|------------------------|-------|-----------|
| 42880855 | 927250    | AC1-221 TAP | DVP           | 304070  | 6PERSON230 T | CPL         | 1      | DVP_P1-2: LN 570 | single | 718.0      | 122.98                | 125.04                 | DC    | 14.96     |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 313853 | 3PONTONDP                          | 0.0570    |
| 314295 | 6BIRDNECK                          | 0.0129    |
| 314333 | 6POWHATN                           | 0.1249    |
| 314429 | 3JTRSVLE                           | 0.2280    |
| 314491 | 3PENDLTN                           | 0.0963    |
| 314507 | 3THOMPSN                           | 0.0977    |
| 314677 | 6BUCKING                           | 0.1929    |
| 314704 | 3LAWRENC                           | 0.1015    |
| 314947 | 8GREENSVILLE                       | 23.0274   |
| 315098 | 1CHESPKA                           | 0.1295    |
| 315099 | 1CHESPKB (Deactivation : 05/31/19) | 0.9868    |
| 315102 | 1BRUNSWICKG1                       | 3.9336    |
| 315103 | 1BRUNSWICKG2                       | 3.9336    |
| 315104 | 1BRUNSWICKG3                       | 3.9336    |
| 315105 | 1BRUNSWICKS1                       | 8.1721    |
| 315108 | 1ELIZAR1                           | 0.9552    |
| 315109 | 1ELIZAR2                           | 0.9386    |
| 315110 | 1ELIZAR3                           | 0.9674    |
| 315153 | 1CLOVER1                           | 14.3989   |
| 315154 | 1CLOVER2                           | 14.2554   |
| 315191 | 1BEARGRDN G1                       | 1.5614    |
| 315192 | 1BEARGRDN G2                       | 1.5614    |
| 315193 | 1BEARGRDN S1                       | 3.2135    |
| 315233 | 1SURRY 2                           | 7.6012    |
| 315260 | 1GOSPORTA                          | 0.1032    |
| 315261 | 1GOSPORTB                          | 0.1319    |
| 315262 | 1GOSPORTC                          | 0.1119    |
| 315266 | 1PLYWOOD A                         | 1.7461    |
| 920291 | AA2-127                            | 0.3244    |
| 924021 | AB2-043 C O1                       | 2.4166    |
| 924161 | AB2-060 C OP                       | 6.9588    |

| Bus #  | Bus                                | MW Impact |
|--------|------------------------------------|-----------|
| 924301 | AB2-077 C O1                       | 1.5570    |
| 924311 | AB2-078 C O1                       | 1.5570    |
| 924321 | AB2-079 C O1                       | 1.5570    |
| 925611 | AC1-036 C                          | 0.7279    |
| 925831 | AC1-062                            | 0.0338    |
| 925991 | AC1-075 C                          | 7.3467    |
| 926021 | AC1-080 C                          | 2.4553    |
| 926271 | AC1-105 C O1                       | 9.4015    |
| 926661 | AC1-147 C                          | 0.7846    |
| 926751 | AC1-161 C O1                       | 11.5301   |
| 927251 | AC1-221 C                          | 9.8772    |
| 927261 | AC1-222 C                          | 6.5915    |
| 932041 | AC2-012 C                          | 3.5494    |
| 932511 | AC2-071 C                          | 1.3618    |
| 932761 | AC2-100 C                          | 22.7311   |
| 933291 | AC2-141 C                          | 11.5301   |
| 933501 | AC2-165 C                          | 3.7688    |
| 934061 | AD1-033 C                          | 2.5679    |
| 934311 | AD1-055 C                          | 4.5767    |
| 934341 | AD1-058 C                          | 24.7606   |
| 934611 | AD1-087 C O1                       | 15.4053   |
| 934621 | AD1-088 C                          | 11.6382   |
| 934991 | AD1-131 C                          | 8.1182    |
| 935171 | AD1-152 C O1                       | 15.3096   |
| 935221 | AD1-157 C                          | 1.1478    |
| 935231 | AD1-160 C                          | 0.8417    |
| 936261 | AD2-033 C                          | 9.9676    |
| 936331 | AD2-043 C (Withdrawn : 12/20/2019) | 8.5281    |
| 936361 | AD2-046 C O1                       | 3.9204    |
| 936481 | AD2-063 C O1                       | 11.5020   |
| 937481 | AD2-202 C O1                       | 4.0826    |
| 938371 | AE1-056 C                          | 4.9482    |
| 938491 | AE1-068 C O1                       | 31.9201   |
| 938501 | AE1-069 C O1                       | 25.7579   |
| 938561 | AE1-075 C                          | 0.7846    |
| 939181 | AE1-148 C O1                       | 4.0187    |
| 939371 | AE1-168 C                          | 11.4894   |
| 939411 | AE1-173 C                          | 37.2816   |
| 940241 | AE2-006                            | 0.3704    |
| 940251 | AE2-007 O1                         | 60.4847   |

| Bus #      | Bus                                   | MW Impact |
|------------|---------------------------------------|-----------|
| 940471     | AE2-031 C                             | 18.0734   |
| 940641     | AE2-051 C O1                          | 7.4826    |
| 940661     | AE2-053 O1                            | 1.4884    |
| 941031     | AE2-094 C                             | 19.7130   |
| 941281     | AE2-122 C O1                          | 9.7739    |
| 941291     | AE2-123 C O1                          | 10.0446   |
| 941301     | AE2-124 C O1                          | 9.1209    |
| 941591     | AE2-156 O1                            | 6.2430    |
| 941791     | AE2-182 C                             | 2.2168    |
| 942451     | AE2-258                               | 1.8028    |
| 942461     | AE2-259 C O1                          | 7.6440    |
| 942751     | AE2-291 C O1                          | 9.2075    |
| 942761     | AE2-292 C O1                          | 11.4643   |
| 942931     | AE2-313 C                             | 19.5691   |
| 943901     | AF1-058 C                             | 3.7769    |
| 943911     | AF1-059                               | 8.8730    |
| 944011     | AF1-069 C                             | 6.4410    |
| 944581     | AF1-123 C O2                          | 14.9558   |
| 944591     | AF1-124 C O2                          | 14.9558   |
| 944601     | AF1-125 C O2                          | 14.9558   |
| 945711     | AF1-236 C O2                          | 30.1353   |
| 945811     | AF1-246 C O2                          | 9.8133    |
| 946291     | AF1-293 C O2                          | 6.6818    |
| 946301     | AF1-294 C                             | 3.8283    |
| 946461     | AF1-310 C O1 (Withdrawn : 11/05/2019) | 26.6361   |
| DUCKCREEK  | DUCKCREEK                             | 4.2467    |
| NEWTON     | NEWTON                                | 4.2056    |
| FARMERCITY | FARMERCITY                            | 0.2430    |
| G-007A     | G-007A                                | 2.7284    |
| VFT        | VFT                                   | 7.2498    |
| AF1-020    | AF1-020                               | 18.1800   |
| PRAIRIE    | PRAIRIE                               | 11.4504   |
| AC1-131    | AC1-131                               | 10.9538   |
| COFFEEN    | COFFEEN                               | 2.0828    |
| EDWARDS    | EDWARDS                               | 1.2617    |
| CHEOAH     | CHEOAH                                | 3.5636    |
| TILTON     | TILTON                                | 2.2283    |
| GIBSON     | GIBSON                                | 2.0235    |
| CALDERWOOD | CALDERWOOD                            | 3.4696    |
| BLUEG      | BLUEG                                 | 6.2288    |

| <b>Bus #</b>   | <b>Bus</b> | <b>MW Impact</b> |
|----------------|------------|------------------|
| <b>TRIMBLE</b> | TRIMBLE    | 1.9750           |
| <b>CATAWBA</b> | CATAWBA    | 3.8616           |

## Short Circuit

### 13.6 Short Circuit

The following Breakers are overdutied:

None

## 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**