# Generation Interconnection

# Feasibility Study Report

# for

# Queue Project AE1-103

# UNION CAMP 115 KV

# 21 MW Capacity / 50 MW Energy

January, 2019

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## 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).

## 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.

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.

## General

The IC has proposed a solar generating facility located in Isle of Wight County, Virginia. The installed facilities will have a capability of 50 MW with 21 MW of this output being recognized by PJM as Capacity. The proposed in-service date for the AE1-103 project is 4/01/2021. This study does not imply an ITO commitment to either in-service date.

| | |
|---|---|
| **Queue Number** | **AE1-103** |
| **Project Name** | UNION CAMP 115 KV |
| **Interconnection Customer** | |
| **State** | Virginia |
| **County** | Isle of Wight |
| **Transmission Owner** | Dominion |
| **MFO** | 50 |
| **MWE** | 50 |
| **MWC** | 21 |
| **Fuel** | Solar |
| **Basecase Study Year** | 2022 |

## Point of Interconnection

### Primary Point of Interconnection

AE1-103 will interconnect with the ITO transmission system into the existing Union Camp 115kV substation. See one line in **Attachment 1**.

### Secondary Point of Interconnection

AE1-103 will interconnect with the ITO transmission system via a new three breaker ring bus switching station that connects on the Union Camp – Holland 115kV line # 68.

## Cost Summary

The AE1-103 project will be responsible for the following costs:

| Description | Total Cost |
|---|---|
| **Attachment Facilities** | $2,750,000 |
| **Direct Connection Network Upgrade** | $0 |
| **Non Direct Connection Network Upgrades** | $ 500,000 |
| **Total Costs** | $3,250,000 |

In addition, the AE1-103 project may be responsible for a contribution to the following costs

(Reference System Reinforcements in the Network Impacts section for details):

| Description | Total Cost |
|---|---|
| **System Upgrades** | $43,000,000 |

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

**Note**: PJM Open Access Transmission Tariff (OATT) section 217.3A outline cost allocation rules. The rules are further clarified in PJM Manual 14A Attachment B. The allocation of costs for a network upgrade will start with the first Queue project to cause the need for the upgrade. Later queue projects will receive cost allocation contingent on their contribution to the violation and are allocated to the queues that have not closed less than 5 years following the execution of the first Interconnection Service Agreement which identifies the need for this upgrade.

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.

## Transmission Owner Scope of Work

## Attachment Facilities

Generation Substation: Install metering and associated protection equipment. Estimated Cost is $550,000.

Transmission: Construct approximately one span of 115 kV Attachment line between the generation substation and a new AE1-103 generator lead line. The estimated cost for this work is $1,000,000.

Union Camp Substation: Build a new one 115 kV breaker bay to the existing Union Camp substation, which will require a site expansion. The estimated cost for this work is $1,200,000.

The estimated total cost of the Attachment Facilities is $3,050,000. It is estimated to take 18-24 months to complete this work. 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. The total preliminary cost estimate for the Attachment work is given in the table below. These costs do not include CIAC Tax Gross-up.

| Description | Total Cost |
|---|---|
| Generation Substation | $ 550,000 |
| Transmission | $1,000,000 |
| Union Camp Substation | $1,200,000 |
| **Total Attachment Facility Costs** | $2,750,000 |

## Direct Connection Cost Estimate

None

## Non-Direct Connection Cost Estimate

Substation: The proposed interconnection substation will need to have the 115 kV bus extended at the existing Union Camp substation, which will require a site expansion. The estimated cost of this work scope is $500,000. It is estimated to take 24-36 months to complete this work.

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.

## Interconnection Customer Requirements

ITO's Facility Connection Requirements as posted on PJM's website
http://www.pjm.com/~/media/planning/plan-standards/private-dominion/facility-connection-requirements1.ashx

Voltage Ride Through Requirements - The Customer Facility shall be designed to remain in service (not trip) for voltages and times as specified for the Eastern Interconnection in Attachment 1 of NERC Reliability Standard PRC-024-1, and successor Reliability Standards, for both high and low voltage conditions, irrespective of generator size, subject to the permissive trip exceptions established in PRC-024-1 (and successor Reliability Standards).

Frequency Ride Through Requirements - The Customer Facility shall be designed to remain in service (not trip) for frequencies and times as specified in Attachment 2 of NERC Reliability Standard PRC-024-1, and successor Reliability Standards, for both high and low frequency condition, irrespective of generator size, subject to the permissive trip exceptions established in PRC-024-1 (and successor Reliability Standards).

Reactive Power - The Generation Interconnection Customer shall design its non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading to 0.95 lagging measured at the generator's terminals.

# Revenue Metering and SCADA Requirements

## PJM Requirements

The IC 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 Appendix 2.

### Meteorological Data Reporting Requirement

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Temperature (degrees Fahrenheit)
- Atmospheric pressure (hectopascals)
- Irradiance
- Forced outage data

## Network Impacts – Option 1

The Queue Project AE1-103 was evaluated as a 50 MW (Capacity 21 MW) injection at the Union Camp 115 kV substation in the ITO area. Project AE1-103 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-103 was studied with a commercial probability of 53%. Potential network impacts were as follows:

# Summer Peak Load Flow

## Generation Deliverability

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

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **342333** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P1-2: LN 1029-B | single | 239.89 | 95.5 | 96.62 | DC | 2.68 |
| **342670** | 934330 | AD1-057 TAP | DVP | 313845 | 6HATHAWAY | DVP | 1 | DVP_P1-2: LN 238 | single | 441.8 | 99.71 | 100.07 | DC | 1.59 |

## 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341674** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 1 | DVP_P4-3: SUFFOLK H542 | breaker | 297.2 | 89.09 | 96.64 | DC | 22.44 |
| **341675** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 1 | DVP_P4-5: L1TL5 | breaker | 297.2 | 88.45 | 96.08 | DC | 22.69 |
| **341702** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 3 | DVP_P4-3: YTH5 | breaker | 307.0 | 84.87 | 92.07 | DC | 22.09 |

## 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341571** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P4-2: 102952 | breaker | 288.6 | 143.5 | 144.49 | DC | 6.33 |
| **341572** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P4-2: 7152 | breaker | 288.6 | 139.04 | 140.03 | DC | 6.33 |
| **342332** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P1-2: LN 1029-A | single | 239.89 | 102.53 | 103.64 | DC | 2.68 |
| **341561** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P4-2: 201262 | breaker | 208.0 | 147.87 | 150.37 | DC | 5.22 |
| **341562** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P4-2: WT2171 | breaker | 208.0 | 125.14 | 127.63 | DC | 5.2 |
| **341708** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 1 | DVP_P4-2: 217162 | breaker | 208.0 | 125.33 | 127.83 | DC | 5.2 |

## 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **342351** | 313720 | 3NEWSOMS | DVP | 314558 | 3BOYKINS | DVP | 1 | DVP_P1-2: LN 68 | operation | 224.66 | 137.16 | 159.41 | DC | 49.98 |
| **342808** | 314526 | 3HANDSOM | DVP | 313720 | 3NEWSOMS | DVP | 1 | DVP_P1-2: LN 68 | operation | 224.66 | 92.72 | 114.97 | DC | 49.99 |
| **342709** | 314527 | 3HOLLAND | DVP | 314536 | 3SUFFOLK | DVP | 1 | DVP_P1-2: LN 1017 | operation | 269.78 | 108.0 | 126.52 | DC | 49.98 |
| **342345** | 314539 | 3UNCAMP | DVP | 314527 | 3HOLLAND | DVP | 1 | DVP_P1-2: LN 1017 | operation | 224.66 | 137.16 | 159.41 | DC | 49.98 |
| **342350** | 314539 | 3UNCAMP | DVP | 314527 | 3HOLLAND | DVP | 1 | Base Case | operation | 224.66 | 92.18 | 106.04 | DC | 31.13 |
| **342664** | 314558 | 3BOYKINS | DVP | 314589 | 3MURPHYS | DVP | 1 | DVP_P1-2: LN 68 | operation | 116.56 | 115.57 | 130.9 | DC | 17.87 |
| **342326** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P1-2: LN 1029-A | operation | 239.89 | 159.18 | 160.39 | DC | 6.39 |
| **342331** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | Base Case | operation | 226.54 | 116.76 | 117.82 | DC | 5.28 |
| **342438** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 1 | DVP_P1-3: 6EARLEYS-TX#4 | operation | 175.78 | 146.49 | 149.44 | DC | 5.2 |
| **342441** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P1-3: 6EARLEYS-TX#3 | operation | 175.78 | 146.26 | 149.21 | DC | 5.2 |
| **342745** | 314577 | 3COX DP | DVP | 313719 | 3CHESTNUT | DVP | 1 | DVP_P1-3: 6CAROLNA-TX#4 | operation | 165.44 | 121.3 | 122.05 | DC | 2.75 |
| **342921** | 314580 | 3MAPLETN | DVP | 314617 | 3TUNIS | DVP | 1 | DVP_P1-2: LN 68 | operation | 142.88 | 90.18 | 102.69 | DC | 17.87 |
| **342825** | 314589 | 3MURPHYS | DVP | 314580 | 3MAPLETN | DVP | 1 | DVP_P1-2: LN 68 | operation | 134.42 | 99.73 | 113.02 | DC | 17.87 |
| **342906** | 925170 | AB2-174 TAP | DVP | 314572 | 3EMPORIA | DVP | 1 | DVP_P1-3: 6CAROLNA-TX#4 | operation | 315.84 | 104.06 | 104.57 | DC | 3.6 |

# System Reinforcements

| ID | Index | Facility | Upgrade Description | Cost |
|---|---|---|---|---|
| 341702 | 4 | 3SUFFOLK 115.0 kV - 6SUFFOLK 115.0 kV Ckt 3 | Description : No Violation. Facility loading does not exceed 100%. | $0 |
| 341708 | 6 | 3EARLEYS 115.0 kV - 6EARLEYS 115.0 kV Ckt 1 | Description : Upgrade Earleys 230 / 115kV Transformer<br>Time Estimate : 24-30 Months<br>Cost : $5,500,000 | $5,500,000 |
| 341561,341562 | 5 | 3EARLEYS 115.0 kV - 6EARLEYS 115.0 kV Ckt 2 | | |
| 342332,341571,341572,342333 | 1 | 3CAROLNA 115.0 kV - 6CAROLNA 115.0 kV Ckt 1 | Description : Add 2nd 230-115 kV Carolina Transformer & Rearrange Substation. Site expansion will be required<br>Time Estimate : 24-30 Months<br>Cost : $5,500,000 | $5,500,000 |
| 341674,341675 | 3 | 3SUFFOLK 115.0 kV - 6SUFFOLK 115.0 kV Ckt 1 | Description : No Violation. Facility loading does not exceed 100%. | $0 |
| 342670 | 2 | AD1-057 TAP 230.0 kV - 6HATHAWAY 230.0 kV Ckt 1 | Description : Wreck & rebuild 12.8 miles of 230kV Line # 2056 between Hathaway substation and Queue AD1-057. Note: line # 2056 is the Hathaway - Rocky Mount tie line between VEPCO and Duke / CPLE. A NC PUC approval will be required<br>Time Estimate : 36-40 Months<br>Cost : $32,000,000 | $32,000,000 |
| | | | **TOTAL COST** | **$43,000,000** |

## Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, 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.

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341571** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P4-2: 102952 | breaker | 288.6 | 143.5 | 144.49 | DC | 6.33 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 1.77 |
| **314541** | 3WATKINS | 0.62 |
| **314578** | 3HORNRTN | 8.18 |
| **314582** | 3KELFORD | 2.17 |
| **314589** | 3MURPHYS | 0.09 |
| **314603** | 3SCOT NK | 2.69 |
| **314617** | 3TUNIS | 0.64 |
| **315126** | 1ROARAP2 | 3.42 |
| **315128** | 1ROARAP4 | 3.29 |
| **315150** | 1BUGGS 1 | 7.88 |
| **315151** | 1BUGGS 2 | 7.88 |
| **315159** | 1KERR 2 | 1.36 |
| **315162** | 1KERR 5 | 1.34 |
| **315163** | 1KERR 6 | 1.34 |
| **315164** | 1KERR 7 | 1.34 |
| **900672** | V4-068 E | 0.31 |
| **907092** | X1-038 E | 4.43 |
| **917332** | Z2-043 E | 0.62 |
| **918491** | AA1-063AC OP | 2.32 |
| **918492** | AA1-063AE OP | 7.14 |
| **918562** | AA1-072 E | 0.1 |
| **919691** | AA2-053 C | 2.93 |
| **919692** | AA2-053 E | 8.21 |
| **919701** | AA2-057 C | 4.74 |
| **919702** | AA2-057 E | 2.37 |
| **920041** | AA2-088 C OP | 1.25 |
| **920042** | AA2-088 E OP | 13.29 |
| **920592** | AA2-165 E | 0.31 |
| **920671** | AA2-174 C | 0.13 |
| **920672** | AA2-174 E | 0.95 |
| **923801** | AB2-015 C O1 | 7.16 |
| **923802** | AB2-015 E O1 | 5.87 |
| **923911** | AB2-031 C O1 | 6.01 |
| **923912** | AB2-031 E O1 | 2.96 |
| **923991** | AB2-040 C O1 | 3.03 |
| **923992** | AB2-040 E O1 | 16.16 |
| **924022** | AB2-043 E O1 | 3.26 |
| **924162** | AB2-060 E O1 | 2.66 |
| **924302** | AB2-077 E O1 | 0.85 |
| **924312** | AB2-078 E O1 | 0.85 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **924322** | AB2-079 E O1 | 0.85 |
| **924401** | AB2-089 C | 2.81 |
| **924402** | AB2-089 E | 1.45 |
| **924501** | AB2-099 C | 0.34 |
| **924502** | AB2-099 E | 0.15 |
| **925171** | AB2-174 C O1 | 18.85 |
| **925172** | AB2-174 E O1 | 17.06 |
| **925612** | AC1-036 E | 0.77 |
| **925781** | AC1-054 C O1 | 10.61 |
| **925782** | AC1-054 E O1 | 4.89 |
| **926201** | AC1-098 C | 5.78 |
| **926202** | AC1-098 E | 3.44 |
| **926211** | AC1-099 C | 1.94 |
| **926212** | AC1-099 E | 1.14 |
| **927141** | AC1-208 C | 11.25 |
| **927142** | AC1-208 E | 5.0 |
| **931231** | AB1-173 C | 0.93 |
| **931232** | AB1-173 E | 2.83 |
| **931241** | AB1-173AC | 0.93 |
| **931242** | AB1-173AE | 2.83 |
| **932631** | AC2-084 C | 8.24 |
| **932632** | AC2-084 E | 4.06 |
| **934201** | AD1-047 C | 21.54 |
| **934202** | AD1-047 E | 14.36 |
| **934231** | AD1-050 C | 6.19 |
| **934232** | AD1-050 E | 3.38 |
| **936261** | AD2-033 C | 6.8 |
| **936262** | AD2-033 E | 4.53 |
| **936361** | AD2-046 C O1 | 8.69 |
| **936362** | AD2-046 E O1 | 3.99 |
| **936481** | AD2-063 C O1 | 8.7 |
| **936482** | AD2-063 E O1 | 5.8 |
| **936711** | AD2-090 C O1 | 7.38 |
| **936712** | AD2-090 E O1 | 4.92 |
| **937571** | AD2-169 C | 26.93 |
| **937572** | AD2-169 E | 17.95 |
| **938771** | AE1-103 C O1 | 2.66 |
| **938772** | AE1-103 E O1 | 3.67 |
| **939181** | AE1-148 C O1 | 8.39 |
| **939182** | AE1-148 E O1 | 5.59 |
| **CARR** | CARR | 0.04 |
| **CBM-S1** | CBM-S1 | 0.35 |
| **CBM-S2** | CBM-S2 | 0.32 |
| **CBM-W1** | CBM-W1 | 0.35 |
| **CBM-W2** | CBM-W2 | 2.24 |
| **CIN** | CIN | 0.17 |
| **CPLE** | CPLE | 0.12 |
| **G-007** | G-007 | 0.14 |
| **IPL** | IPL | 0.11 |
| **LGEE** | LGEE | 0.05 |
| **MEC** | MEC | 0.35 |
| **MECS** | MECS | 0.13 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **O-066** | O-066 | 0.47 |
| **RENSSELAER** | RENSSELAER | 0.03 |
| **WEC** | WEC | 0.04 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **342670** | 934330 | AD1-057 TAP | DVP | 313845 | 6HATHAWAY | DVP | 1 | DVP_P1-2: LN 238 | single | 441.8 | 99.71 | 100.07 | DC | 1.59 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314589** | 3MURPHYS | 0.05 |
| **314704** | 3LAWRENC | 0.21 |
| **315115** | 1S HAMPT1 | 0.73 |
| **315126** | 1ROARAP2 | 1.42 |
| **315128** | 1ROARAP4 | 1.37 |
| **315136** | 1ROSEMG1 | 5.27 |
| **315137** | 1ROSEMS1 | 3.27 |
| **315138** | 1ROSEMG2 | 2.47 |
| **315139** | 1GASTONA | 6.4 |
| **315141** | 1GASTONB | 6.4 |
| **315158** | 1KERR 1 | 0.14 |
| **315159** | 1KERR 2 | 0.56 |
| **315160** | 1KERR 3 | 0.56 |
| **315161** | 1KERR 4 | 0.56 |
| **315162** | 1KERR 5 | 0.56 |
| **315163** | 1KERR 6 | 0.56 |
| **315164** | 1KERR 7 | 0.56 |
| **917331** | Z2-043 C | 0.15 |
| **918491** | AA1-063AC OP | 1.16 |
| **918511** | AA1-065 C OP | 0.7 |
| **918561** | AA1-072 C | 0.02 |
| **919691** | AA2-053 C | 1.33 |
| **920041** | AA2-088 C OP | 0.65 |
| **920671** | AA2-174 C | 0.06 |
| **923801** | AB2-015 C O1 | 4.13 |
| **923911** | AB2-031 C O1 | 2.15 |
| **923991** | AB2-040 C O1 | 1.08 |
| **924021** | AB2-043 C O1 | 0.16 |
| **924161** | AB2-060 C O1 | 0.44 |
| **924301** | AB2-077 C O1 | 0.1 |
| **924311** | AB2-078 C O1 | 0.1 |
| **924321** | AB2-079 C O1 | 0.1 |
| **924401** | AB2-089 C | 1.16 |
| **924501** | AB2-099 C | 0.34 |
| **924511** | AB2-100 C | 25.42 |
| **925171** | AB2-174 C O1 | 6.51 |
| **925781** | AC1-054 C O1 | 4.39 |
| **926071** | AC1-086 C | 46.93 |
| **930861** | AB1-132 C O1 | 4.89 |
| **931231** | AB1-173 C | 0.33 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **931241** | AB1-173AC | 0.33 |
| **933991** | AD1-023 C | 4.9 |
| **934201** | AD1-047 C | 7.71 |
| **934231** | AD1-050 C | 2.56 |
| **934331** | AD1-057 C O1 | 38.44 |
| **934521** | AD1-076 C | 17.69 |
| **936361** | AD2-046 C O1 | 3.67 |
| **936401** | AD2-051 C O1 | 4.87 |
| **936711** | AD2-090 C O1 | 4.03 |
| **937571** | AD2-169 C | 10.0 |
| **938171** | AE1-026 C1 O | 11.22 |
| **938172** | AE1-026 C2 O | 1.62 |
| **938221** | AE1-035 C | 1.15 |
| **938771** | AE1-103 C O1 | 1.59 |
| **939071** | AE1-135 C O1 | 45.52 |
| **939181** | AE1-148 C O1 | 3.58 |
| **BAYOU** | BAYOU | 1.14 |
| **BIG_CAJUN1** | BIG_CAJUN1 | 1.79 |
| **BIG_CAJUN2** | BIG_CAJUN2 | 3.6 |
| **BLUEG** | BLUEG | 3.38 |
| **CALDERWOOD** | CALDERWOOD | 0.66 |
| **CANNELTON** | CANNELTON | 0.23 |
| **CARR** | CARR | 0.0 |
| **CATAWBA** | CATAWBA | 0.64 |
| **CHEOAH** | CHEOAH | 0.62 |
| **CHILHOWEE** | CHILHOWEE | 0.22 |
| **CHOCTAW** | CHOCTAW | 1.22 |
| **COFFEEN** | COFFEEN | 0.39 |
| **COTTONWOOD** | COTTONWOOD | 4.45 |
| **DEARBORN** | DEARBORN | 0.45 |
| **DUCKCREEK** | DUCKCREEK | 0.81 |
| **EDWARDS** | EDWARDS | 0.36 |
| **ELMERSMITH** | ELMERSMITH | 0.4 |
| **FARMERCITY** | FARMERCITY | 0.28 |
| **G-007A** | G-007A | 0.12 |
| **GIBSON** | GIBSON | 0.15 |
| **HAMLET** | HAMLET | 2.58 |
| **NEWTON** | NEWTON | 1.02 |
| **O-066A** | O-066A | 0.05 |
| **PRAIRIE** | PRAIRIE | 2.12 |
| **RENSSELAER** | RENSSELAER | 0.0 |
| **SANTEETLA** | SANTEETLA | 0.18 |
| **SMITHLAND** | SMITHLAND | 0.19 |
| **TATANKA** | TATANKA | 0.48 |
| **TILTON** | TILTON | 0.43 |
| **TRIMBLE** | TRIMBLE | 0.37 |
| **TVA** | TVA | 1.88 |
| **UNIONPOWER** | UNIONPOWER | 0.93 |
| **VFT** | VFT | 0.3 |

## Index 3

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC\|DC | MW IMPACT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341675** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 1 | DVP_P4-5: L1TL5 | breaker | 297.2 | 88.45 | 96.08 | DC | 22.69 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 6.35 |
| **314541** | 3WATKINS | 1.58 |
| **314589** | 3MURPHYS | 0.09 |
| **314617** | 3TUNIS | 0.59 |
| **315115** | 1S HAMPT1 | 3.14 |
| **900672** | V4-068 E | 0.33 |
| **907092** | X1-038 E | 15.88 |
| **920041** | AA2-088 C OP | 1.58 |
| **920042** | AA2-088 E OP | 16.86 |
| **923801** | AB2-015 C O1 | 20.96 |
| **923802** | AB2-015 E O1 | 17.19 |
| **924501** | AB2-099 C | 0.27 |
| **924502** | AB2-099 E | 0.11 |
| **925061** | AB2-161 C O1 | 7.91 |
| **925062** | AB2-161 E O1 | 12.9 |
| **932581** | AC2-078 C O1 | 4.76 |
| **932582** | AC2-078 E O1 | 7.76 |
| **932591** | AC2-079 C O1 | 17.59 |
| **932592** | AC2-079 E O1 | 28.7 |
| **934571** | AD1-082 C | 18.03 |
| **934572** | AD1-082 E | 10.28 |
| **936661** | AD2-085 C | 10.41 |
| **936662** | AD2-085 E | 16.98 |
| **936711** | AD2-090 C O1 | 14.78 |
| **936712** | AD2-090 E O1 | 9.85 |
| **938631** | AE1-085 C O1 | 14.33 |
| **938632** | AE1-085 E O1 | 9.56 |
| **938771** | AE1-103 C O1 | 9.53 |
| **938772** | AE1-103 E O1 | 13.16 |
| **938841** | AE1-109AC O1 | 21.13 |
| **938842** | AE1-109AE O1 | 14.08 |
| **939191** | AE1-149 C O1 | 9.99 |
| **939192** | AE1-149 E O1 | 6.66 |
| **940061** | AE1-248 C O1 | 37.47 |
| **940062** | AE1-248 E O1 | 24.98 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.4 |
| **CBM-S2** | CBM-S2 | 0.47 |
| **CBM-W1** | CBM-W1 | 0.4 |
| **CBM-W2** | CBM-W2 | 2.62 |
| **CIN** | CIN | 0.18 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **CPLE** | CPLE | 0.26 |
| **G-007** | G-007 | 0.07 |
| **IPL** | IPL | 0.11 |
| **LGEE** | LGEE | 0.05 |
| **MEC** | MEC | 0.4 |
| **MECS** | MECS | 0.17 |
| **O-066** | O-066 | 0.22 |
| **RENSSELAER** | RENSSELAER | 0.02 |
| **WEC** | WEC | 0.05 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341702** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 3 | DVP_P4-3: YTH5 | breaker | 307.0 | 84.87 | 92.07 | DC | 22.09 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 6.19 |
| **314541** | 3WATKINS | 1.54 |
| **314589** | 3MURPHYS | 0.09 |
| **314617** | 3TUNIS | 0.56 |
| **315115** | 1S HAMPT1 | 3.06 |
| **900672** | V4-068 E | 0.32 |
| **907092** | X1-038 E | 15.46 |
| **920041** | AA2-088 C OP | 1.54 |
| **920042** | AA2-088 E OP | 16.36 |
| **923801** | AB2-015 C O1 | 20.4 |
| **923802** | AB2-015 E O1 | 16.73 |
| **925061** | AB2-161 C O1 | 7.71 |
| **925062** | AB2-161 E O1 | 12.59 |
| **932581** | AC2-078 C O1 | 4.64 |
| **932582** | AC2-078 E O1 | 7.57 |
| **932591** | AC2-079 C O1 | 17.16 |
| **932592** | AC2-079 E O1 | 28.0 |
| **934571** | AD1-082 C | 17.58 |
| **934572** | AD1-082 E | 10.03 |
| **936661** | AD2-085 C | 10.15 |
| **936662** | AD2-085 E | 16.56 |
| **936711** | AD2-090 C O1 | 14.37 |
| **936712** | AD2-090 E O1 | 9.58 |
| **938631** | AE1-085 C O1 | 13.97 |
| **938632** | AE1-085 E O1 | 9.32 |
| **938771** | AE1-103 C O1 | 9.28 |
| **938772** | AE1-103 E O1 | 12.81 |
| **938841** | AE1-109AC O1 | 20.6 |
| **938842** | AE1-109AE O1 | 13.74 |
| **939191** | AE1-149 C O1 | 9.74 |
| **939192** | AE1-149 E O1 | 6.49 |
| **940061** | AE1-248 C O1 | 36.54 |
| **940062** | AE1-248 E O1 | 24.36 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.35 |
| **CBM-S2** | CBM-S2 | 0.41 |
| **CBM-W1** | CBM-W1 | 0.36 |
| **CBM-W2** | CBM-W2 | 2.31 |
| **CIN** | CIN | 0.16 |
| **CPLE** | CPLE | 0.22 |
| **G-007** | G-007 | 0.06 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **IPL** | IPL | 0.1 |
| **LGEE** | LGEE | 0.05 |
| **MEC** | MEC | 0.36 |
| **MECS** | MECS | 0.15 |
| **O-066** | O-066 | 0.19 |
| **RENSSELAER** | RENSSELAER | 0.01 |
| **WEC** | WEC | 0.04 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341561** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P4-2: 201262 | breaker | 208.0 | 147.87 | 150.37 | DC | 5.22 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 1.46 |
| **314541** | 3WATKINS | 0.52 |
| **314572** | 3EMPORIA | 0.18 |
| **314578** | 3HORNRTN | 2.81 |
| **314582** | 3KELFORD | 9.44 |
| **314589** | 3MURPHYS | 0.15 |
| **314603** | 3SCOT NK | 6.48 |
| **314617** | 3TUNIS | 2.15 |
| **314623** | 3WITAKRS | 0.69 |
| **315115** | 1S HAMPT1 | 1.1 |
| **315126** | 1ROARAP2 | 1.03 |
| **315128** | 1ROARAP4 | 0.99 |
| **900672** | V4-068 E | 0.55 |
| **907092** | X1-038 E | 3.65 |
| **917331** | Z2-043 C | 0.96 |
| **917332** | Z2-043 E | 2.68 |
| **917342** | Z2-044 E | 0.3 |
| **918491** | AA1-063AC OP | 2.41 |
| **918492** | AA1-063AE OP | 7.42 |
| **918561** | AA1-072 C | 0.14 |
| **918562** | AA1-072 E | 0.45 |
| **919691** | AA2-053 C | 1.86 |
| **919692** | AA2-053 E | 5.21 |
| **919701** | AA2-057 C | 5.23 |
| **919702** | AA2-057 E | 2.61 |
| **920041** | AA2-088 C OP | 1.08 |
| **920042** | AA2-088 E OP | 11.54 |
| **920591** | AA2-165 C | 0.11 |
| **920592** | AA2-165 E | 0.34 |
| **920671** | AA2-174 C | 0.09 |
| **920672** | AA2-174 E | 0.6 |
| **923801** | AB2-015 C O1 | 6.0 |
| **923802** | AB2-015 E O1 | 4.92 |
| **923911** | AB2-031 C O1 | 1.29 |
| **923912** | AB2-031 E O1 | 0.63 |
| **923992** | AB2-040 E O1 | 3.46 |
| **924401** | AB2-089 C | 0.89 |
| **924402** | AB2-089 E | 0.46 |
| **924501** | AB2-099 C | 1.76 |
| **924502** | AB2-099 E | 0.76 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **925171** | AB2-174 C O1 | 3.68 |
| **925172** | AB2-174 E O1 | 3.33 |
| **925781** | AC1-054 C O1 | 3.34 |
| **925782** | AC1-054 E O1 | 1.54 |
| **926201** | AC1-098 C | 9.29 |
| **926202** | AC1-098 E | 5.53 |
| **926211** | AC1-099 C | 3.11 |
| **926212** | AC1-099 E | 1.83 |
| **927141** | AC1-208 C | 9.21 |
| **927142** | AC1-208 E | 4.09 |
| **931232** | AB1-173 E | 0.61 |
| **931242** | AB1-173AE | 0.61 |
| **932631** | AC2-084 C | 13.24 |
| **932632** | AC2-084 E | 6.52 |
| **934201** | AD1-047 C | 4.61 |
| **934202** | AD1-047 E | 3.07 |
| **934231** | AD1-050 C | 1.97 |
| **934232** | AD1-050 E | 1.08 |
| **936401** | AD2-051 C O1 | 29.7 |
| **936402** | AD2-051 E O1 | 12.75 |
| **936711** | AD2-090 C O1 | 6.31 |
| **936712** | AD2-090 E O1 | 4.2 |
| **937571** | AD2-169 C | 6.32 |
| **937572** | AD2-169 E | 4.21 |
| **938174** | AE1-026 CBAT | 1.16 |
| **938175** | AE1-026 EBAT | 4.65 |
| **938661** | AE1-088 | 0.77 |
| **938771** | AE1-103 C O1 | 2.19 |
| **938772** | AE1-103 E O1 | 3.03 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.07 |
| **CBM-S2** | CBM-S2 | 0.03 |
| **CBM-W1** | CBM-W1 | 0.03 |
| **CBM-W2** | CBM-W2 | 0.38 |
| **CIN** | CIN | 0.02 |
| **DEARBORN** | DEARBORN | 0.0 |
| **G-007** | G-007 | 0.07 |
| **IPL** | IPL | 0.01 |
| **LGEE** | LGEE | 0.01 |
| **MEC** | MEC | 0.05 |
| **O-066** | O-066 | 0.25 |
| **RENSSELAER** | RENSSELAER | 0.02 |
| **WEC** | WEC | 0.0 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **341708** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 1 | DVP_P4-2: 217162 | breaker | 208.0 | 125.33 | 127.83 | DC | 5.2 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 1.46 |
| **314541** | 3WATKINS | 0.52 |
| **314578** | 3HORNRTN | 2.4 |
| **314582** | 3KELFORD | 9.59 |
| **314589** | 3MURPHYS | 0.15 |
| **314603** | 3SCOT NK | 6.48 |
| **314617** | 3TUNIS | 2.18 |
| **314623** | 3WITAKRS | 0.63 |
| **315115** | 1S HAMPT1 | 1.08 |
| **315126** | 1ROARAP2 | 0.86 |
| **315128** | 1ROARAP4 | 0.83 |
| **900672** | V4-068 E | 0.55 |
| **907092** | X1-038 E | 3.64 |
| **917331** | Z2-043 C | 0.98 |
| **917332** | Z2-043 E | 2.73 |
| **917342** | Z2-044 E | 0.27 |
| **918491** | AA1-063AC OP | 2.35 |
| **918492** | AA1-063AE OP | 7.23 |
| **918561** | AA1-072 C | 0.15 |
| **918562** | AA1-072 E | 0.45 |
| **919691** | AA2-053 C | 1.75 |
| **919692** | AA2-053 E | 4.89 |
| **919701** | AA2-057 C | 4.87 |
| **919702** | AA2-057 E | 2.43 |
| **920041** | AA2-088 C OP | 1.06 |
| **920042** | AA2-088 E OP | 11.24 |
| **920591** | AA2-165 C | 0.1 |
| **920592** | AA2-165 E | 0.32 |
| **920671** | AA2-174 C | 0.08 |
| **920672** | AA2-174 E | 0.56 |
| **923801** | AB2-015 C O1 | 5.93 |
| **923802** | AB2-015 E O1 | 4.86 |
| **923911** | AB2-031 C O1 | 0.99 |
| **923912** | AB2-031 E O1 | 0.49 |
| **923992** | AB2-040 E O1 | 2.66 |
| **924501** | AB2-099 C | 1.8 |
| **924502** | AB2-099 E | 0.77 |
| **925171** | AB2-174 C O1 | 2.75 |
| **925172** | AB2-174 E O1 | 2.49 |
| **925781** | AC1-054 C O1 | 2.75 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **925782** | AC1-054 E O1 | 1.27 |
| **926201** | AC1-098 C | 9.12 |
| **926202** | AC1-098 E | 5.44 |
| **926211** | AC1-099 C | 3.06 |
| **926212** | AC1-099 E | 1.8 |
| **927141** | AC1-208 C | 8.65 |
| **927142** | AC1-208 E | 3.84 |
| **931232** | AB1-173 E | 0.47 |
| **931242** | AB1-173AE | 0.47 |
| **932631** | AC2-084 C | 13.01 |
| **932632** | AC2-084 E | 6.41 |
| **934201** | AD1-047 C | 3.55 |
| **934202** | AD1-047 E | 2.37 |
| **936401** | AD2-051 C O1 | 30.42 |
| **936402** | AD2-051 E O1 | 13.06 |
| **936711** | AD2-090 C O1 | 6.19 |
| **936712** | AD2-090 E O1 | 4.12 |
| **937571** | AD2-169 C | 4.99 |
| **937572** | AD2-169 E | 3.33 |
| **938174** | AE1-026 CBAT | 0.8 |
| **938175** | AE1-026 EBAT | 3.21 |
| **938771** | AE1-103 C O1 | 2.18 |
| **938772** | AE1-103 E O1 | 3.01 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.03 |
| **CBM-S2** | CBM-S2 | 0.02 |
| **CBM-W2** | CBM-W2 | 0.17 |
| **CIN** | CIN | 0.0 |
| **DEARBORN** | DEARBORN | 0.01 |
| **G-007** | G-007 | 0.06 |
| **IPL** | IPL | 0.0 |
| **LGEE** | LGEE | 0.0 |
| **MEC** | MEC | 0.01 |
| **O-066** | O-066 | 0.21 |
| **RENSSELAER** | RENSSELAER | 0.02 |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-2: 201262** | CONTINGENCY 'DVP_P4-2: 201262' /* EARLEYS 230 KV<br>OPEN BRANCH FROM BUS 314266 TO BUS 314569 CKT 1 /* 6NORTHAMPTON230.00 - 6EARLEYS 230.00<br>OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 6NORTHAMPTON230.00 - 6ROA VAL 230.00<br>OPEN BUS 314266 /* ISLAND: 6NORTHAMPTON230.00<br>OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 1 /* 3EARLEYS 115.00 - 6EARLEYS 230.00<br>END |
| **DVP_P1-2: LN 1029-B** | CONTINGENCY 'DVP_P1-2: LN 1029-B'<br>OPEN BRANCH FROM BUS 925170 TO BUS 314615 CKT 1 /* AB2-174 TAP 115.00 - 3TREGOTP 115.00<br>END |
| **DVP_P4-5: L1TL5** | CONTINGENCY 'DVP_P4-5: L1TL5' /* SUFFOLK 115 KV<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 3 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>END |
| **DVP_P4-3: SUFFOLK H542** | CONTINGENCY 'DVP_P4-3: SUFFOLK H542' /* SUFFOLK 230 KV<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 3 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314537 TO BUS 314928 CKT 2 /* 6SUFFOLK 230.00 - 8SUFFOLK 500.00<br>END |
| **DVP_P4-2: 102952** | CONTINGENCY 'DVP_P4-2: 102952' /* CLUBHOUSE 115 KV<br>OPEN BRANCH FROM BUS 314312 TO BUS 314325 CKT 1 /* 3JARRATT 115.00 - 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314325 TO BUS 314562 CKT 1 /* 3PURDYSW 115.00 - 3CLUBHSE 115.00<br>OPEN BUS 314312 /* ISLAND: 3JARRATT 115.00<br>OPEN BUS 314325 /* ISLAND: 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314572 CKT 1 /* 3METCATP 115.00 - 3EMPORIA 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314588 CKT 1 /* 3METCATP 115.00 - 3METCALF 115.00<br>OPEN BRANCH FROM BUS 314572 TO BUS 925170 CKT 1 /* 3EMPORIA 115.00 - AB2-174 TAP 115.00 /* CONTINGENCY LINE ADDED FOR AE1 BUILD<br>OPEN BRANCH FROM BUS 314572 TO BUS 314863 CKT 1 /* 3EMPORIA 115.00 - 3EMPOR_1 115.00<br>OPEN BUS 314570 /* ISLAND: 3METCATP 115.00<br>OPEN BUS 314572 /* ISLAND: 3EMPORIA 115.00<br>OPEN BUS 314588 /* ISLAND: 3METCALF 115.00<br>OPEN BUS 314863 /* ISLAND: 3EMPOR_1 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314565 CKT Z1 /* 3CLUBHSE 115.00 - 3CLUBHSE71 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00<br>OPEN BUS 314562 /* 3CLUBHSE 115.00 KV<br>END |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-2: WT2171** | CONTINGENCY 'DVP_P4-2: WT2171' /* EARLEYS 230 KV<br>OPEN BRANCH FROM BUS 313709 TO BUS 314569 CKT Z1 /* 6HOLLOMAN 230.00 - 6EARLEYS 230.00<br>OPEN BUS 313709 /* ISLAND: 6HOLLOMAN 230.00<br>OPEN BUS 918511 /* ISLAND: AA1-065 C OP230.00<br>OPEN BUS 918512 /* ISLAND: AA1-065 E OP230.00<br>OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 1 /* 3EARLEYS 115.00 - 6EARLEYS 230.00<br>END |
| **DVP_P1-2: LN 238** | CONTINGENCY 'DVP_P1-2: LN 238'<br>OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /* 6CARSON 230.00 - 6SAPONY 230.00<br>OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /* 6SAPONY 230.00 - 6CLUBHSE 230.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00<br>OPEN BUS 314435 /* ISLAND: 6SAPONY 230.00<br>END |
| **DVP_P4-2: 217162** | CONTINGENCY 'DVP_P4-2: 217162' /* EARLEYS 230 KV<br>OPEN BRANCH FROM BUS 313709 TO BUS 314569 CKT Z1 /* 6HOLLOMAN 230.00 - 6EARLEYS 230.00<br>OPEN BUS 313709 /* ISLAND: 6HOLLOMAN 230.00<br>OPEN BUS 918511 /* ISLAND: AA1-065 C OP230.00<br>OPEN BUS 918512 /* ISLAND: AA1-065 E OP230.00<br>OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 2 /* 3EARLEYS 115.00 - 6EARLEYS 230.00<br>END |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-2: 7152** | CONTINGENCY 'DVP_P4-2: 7152' /* CLUBHOUSE 115 KV<br>OPEN BRANCH FROM BUS 314516 TO BUS 314676 CKT 1 /* 3BRUNWICK_1 115.00 - 3BRUNWICK 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314565 CKT Z1 /* 3CLUBHSE 115.00 - 3CLUBHSE71 115.00<br>OPEN BRANCH FROM BUS 314565 TO BUS 314693 CKT 1 /* 3CLUBHSE71 115.00 - 3FRMAN D 115.00<br>OPEN BRANCH FROM BUS 314565 TO BUS 314850 CKT 1 /* 3CLUBHSE71 115.00 - 3CLUBHSE71_1115.00<br>OPEN BRANCH FROM BUS 314675 TO BUS 314676 CKT 1 /* 3BRODNAX 115.00 - 3BRUNWICK 115.00<br>OPEN BRANCH FROM BUS 314676 TO BUS 314704 CKT 1 /* 3BRUNWICK 115.00 - 3LAWRENC 115.00<br>OPEN BRANCH FROM BUS 314693 TO BUS 314704 CKT 1 /* 3FRMAN D 115.00 - 3LAWRENC 115.00<br>OPEN BUS 314516 /* ISLAND: 3BRUNWICK_1 115.00<br>OPEN BUS 314565 /* ISLAND: 3CLUBHSE71 115.00<br>OPEN BUS 314676 /* ISLAND: 3BRUNWICK 115.00<br>OPEN BUS 314782 /* ISLAND: 2BRUNWICK 69.000<br>OPEN BUS 314785 /* ISLAND: 2DANLTWN 69.000<br>OPEN BUS 314786 /* ISLAND: 2GASBURG 69.000<br>OPEN BUS 314787 /* ISLAND: 2BRUNWICK2 69.000<br>OPEN BUS 314872 /* ISLAND: 2BRUNSWICKDP69.000<br>OPEN BUS 314693 /* ISLAND: 3FRMAN D 115.00<br>OPEN BUS 314704 /* ISLAND: 3LAWRENC 115.00<br>OPEN BUS 314850 /* ISLAND: 3CLUBHSE71_1115.00<br>OPEN BRANCH FROM BUS 314312 TO BUS 314325 CKT 1 /* 3JARRATT 115.00 - 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314325 TO BUS 314562 CKT 1 /* 3PURDYSW 115.00 - 3CLUBHSE 115.00<br>OPEN BUS 314312 /* ISLAND: 3JARRATT 115.00<br>OPEN BUS 314325 /* ISLAND: 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00<br>OPEN BUS 314562 /* 3CLUBHSE 115.00 KV<br>END |
| **DVP_P1-2: LN 1029-A** | CONTINGENCY 'DVP_P1-2: LN 1029-A'<br>OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314572 CKT 1 /* 3METCATP 115.00 - 3EMPORIA 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314588 CKT 1 /* 3METCATP 115.00 - 3METCALF 115.00<br>OPEN BRANCH FROM BUS 314572 TO BUS 925170 CKT 1 /* 3EMPORIA 115.00 - AB2-174 TAP 115.00<br>OPEN BRANCH FROM BUS 314572 TO BUS 314863 CKT 1 /* 3EMPORIA 115.00 - 3EMPOR_1 115.00<br>OPEN BUS 314570 /* ISLAND: 3METCATP 115.00<br>OPEN BUS 314572 /* ISLAND: 3EMPORIA 115.00<br>OPEN BUS 314588 /* ISLAND: 3METCALF 115.00<br>OPEN BUS 314863 /* ISLAND: 3EMPOR_1 115.00<br>END |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-3: YTH5** | CONTINGENCY 'DVP_P4-3: YTH5' /* SUFFOLK 230 KV<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 1 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314537 TO BUS 314928 CKT 1 /* 6SUFFOLK 230.00 - 8SUFFOLK 500.00<br>REMOVE SWSHUNT FROM BUS 314537<br>END |

# Short Circuit

## Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None

Contributions to previously identified circuit breakers found to be over-duty:

None

## Network Impacts – Option 2

The Queue Project AE1-103 was evaluated as a 50 MW (Capacity 21 MW) injection tapping the Union Camp to Holland 115 kV line in the ITO area. Project AE1-103 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-103 was studied with a commercial probability of 53%. Potential network impacts were as follows:

# Summer Peak Load Flow

## Generation Deliverability

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

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **293616** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P1-2: LN 1029-B | single | 239.89 | 95.45 | 96.47 | DC | 2.43 |
| **294027** | 934330 | AD1-057 TAP | DVP | 313845 | 6HATHAWAY | DVP | 1 | DVP_P1-2: LN 238 | single | 441.8 | 99.75 | 100.09 | DC | 1.49 |

## 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292825** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 1 | DVP_P4-3: SUFFOLK H542 | breaker | 297.2 | 88.87 | 96.83 | DC | 23.67 |
| **292826** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 1 | DVP_P4-5: L1TL5 | breaker | 297.2 | 88.26 | 96.31 | DC | 23.93 |
| **292872** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 3 | DVP_P4-3: YTH5 | breaker | 307.0 | 84.66 | 92.25 | DC | 23.31 |

## 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292705** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P4-2: 102952 | breaker | 288.6 | 143.43 | 144.33 | DC | 5.73 |
| **292706** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P4-2: 7152 | breaker | 288.6 | 139.02 | 139.92 | DC | 5.73 |
| **293615** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P1-2: LN 1029-A | single | 239.89 | 102.52 | 103.54 | DC | 2.43 |
| **292696** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P4-2: 201262 | breaker | 208.0 | 147.85 | 148.85 | DC | 4.66 |
| **292697** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P4-2: WT2171 | breaker | 208.0 | 125.13 | 126.14 | DC | 4.67 |
| **292902** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 1 | DVP_P4-2: 217162 | breaker | 208.0 | 125.33 | 126.34 | DC | 4.67 |

## 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **293647** | 313720 | 3NEWSOMS | DVP | 314558 | 3BOYKINS | DVP | 1 | DVP_P1-2: LN 68-A | operation | 224.66 | 137.16 | 159.41 | DC | 49.98 |
| **294160** | 314218 | 6ELMONT | DVP | 314908 | 8ELMONT | DVP | 1 | DVP_P1-2: LN 557 | operation | 920.92 | 99.75 | 100.0 | DC | 5.01 |
| **294141** | 314526 | 3HANDSOM | DVP | 313720 | 3NEWSOMS | DVP | 1 | DVP_P1-2: LN 68-A | operation | 224.66 | 92.72 | 114.97 | DC | 49.99 |
| **294064** | 314527 | 3HOLLAND | DVP | 314536 | 3SUFFOLK | DVP | 1 | DVP_P1-2: LN 1017 | operation | 269.78 | 108.0 | 126.52 | DC | 49.98 |
| **294012** | 314558 | 3BOYKINS | DVP | 314589 | 3MURPHYS | DVP | 1 | DVP_P1-2: LN 68-A | operation | 116.56 | 115.57 | 130.9 | DC | 17.87 |
| **293609** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P1-2: LN 1029-A | operation | 239.89 | 159.18 | 160.27 | DC | 5.79 |
| **293614** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | Base Case | operation | 226.54 | 116.72 | 117.67 | DC | 4.78 |
| **293817** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 1 | DVP_P1-3: 6EARLEYS-TX#4 | operation | 175.78 | 146.42 | 147.62 | DC | 4.67 |
| **293820** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P1-3: 6EARLEYS-TX#3 | operation | 175.78 | 146.2 | 147.39 | DC | 4.67 |
| **294257** | 314580 | 3MAPLETN | DVP | 314617 | 3TUNIS | DVP | 1 | DVP_P1-2: LN 68-A | operation | 142.88 | 90.18 | 102.69 | DC | 17.87 |
| **294168** | 314589 | 3MURPHYS | DVP | 314580 | 3MAPLETN | DVP | 1 | DVP_P1-2: LN 68-A | operation | 134.42 | 99.73 | 113.02 | DC | 17.87 |
| **293648** | 938770 | AE1-103 TAP | DVP | 314527 | 3HOLLAND | DVP | 1 | DVP_P1-2: LN 1017 | operation | 224.66 | 137.16 | 159.41 | DC | 49.98 |
| **293653** | 938770 | AE1-103 TAP | DVP | 314527 | 3HOLLAND | DVP | 1 | Base Case | operation | 224.66 | 92.14 | 106.75 | DC | 32.82 |

## Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, 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.

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292705** | 314559 | 3CAROLNA | DVP | 314561 | 6CAROLNA | DVP | 1 | DVP_P4-2: 102952 | breaker | 288.6 | 143.43 | 144.33 | DC | 5.73 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 1.77 |
| **314541** | 3WATKINS | 0.62 |
| **314578** | 3HORNRTN | 8.18 |
| **314582** | 3KELFORD | 2.17 |
| **314589** | 3MURPHYS | 0.09 |
| **314603** | 3SCOT NK | 2.68 |
| **314617** | 3TUNIS | 0.64 |
| **315126** | 1ROARAP2 | 3.42 |
| **315128** | 1ROARAP4 | 3.29 |
| **315150** | 1BUGGS 1 | 7.88 |
| **315151** | 1BUGGS 2 | 7.88 |
| **315159** | 1KERR 2 | 1.36 |
| **315162** | 1KERR 5 | 1.34 |
| **315163** | 1KERR 6 | 1.34 |
| **315164** | 1KERR 7 | 1.34 |
| **900672** | V4-068 E | 0.31 |
| **907092** | X1-038 E | 4.43 |
| **917332** | Z2-043 E | 0.62 |
| **918491** | AA1-063AC OP | 2.32 |
| **918492** | AA1-063AE OP | 7.14 |
| **918562** | AA1-072 E | 0.1 |
| **919691** | AA2-053 C | 2.93 |
| **919692** | AA2-053 E | 8.21 |
| **919701** | AA2-057 C | 4.73 |
| **919702** | AA2-057 E | 2.37 |
| **920041** | AA2-088 C OP | 1.25 |
| **920042** | AA2-088 E OP | 13.29 |
| **920592** | AA2-165 E | 0.31 |
| **920671** | AA2-174 C | 0.13 |
| **920672** | AA2-174 E | 0.95 |
| **923801** | AB2-015 C O1 | 7.16 |
| **923802** | AB2-015 E O1 | 5.87 |
| **923911** | AB2-031 C O1 | 6.01 |
| **923912** | AB2-031 E O1 | 2.96 |
| **923991** | AB2-040 C O1 | 3.03 |
| **923992** | AB2-040 E O1 | 16.16 |
| **924022** | AB2-043 E O1 | 3.26 |
| **924162** | AB2-060 E O1 | 2.66 |
| **924302** | AB2-077 E O1 | 0.85 |
| **924312** | AB2-078 E O1 | 0.85 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **924322** | AB2-079 E O1 | 0.85 |
| **924401** | AB2-089 C | 2.81 |
| **924402** | AB2-089 E | 1.45 |
| **924501** | AB2-099 C | 0.34 |
| **924502** | AB2-099 E | 0.15 |
| **925171** | AB2-174 C O1 | 18.85 |
| **925172** | AB2-174 E O1 | 17.05 |
| **925612** | AC1-036 E | 0.77 |
| **925781** | AC1-054 C O1 | 10.61 |
| **925782** | AC1-054 E O1 | 4.89 |
| **926201** | AC1-098 C | 5.78 |
| **926202** | AC1-098 E | 3.44 |
| **926211** | AC1-099 C | 1.94 |
| **926212** | AC1-099 E | 1.14 |
| **927141** | AC1-208 C | 11.25 |
| **927142** | AC1-208 E | 5.0 |
| **931231** | AB1-173 C | 0.93 |
| **931232** | AB1-173 E | 2.83 |
| **931241** | AB1-173AC | 0.93 |
| **931242** | AB1-173AE | 2.83 |
| **932631** | AC2-084 C | 8.24 |
| **932632** | AC2-084 E | 4.06 |
| **934201** | AD1-047 C | 21.54 |
| **934202** | AD1-047 E | 14.36 |
| **934231** | AD1-050 C | 6.19 |
| **934232** | AD1-050 E | 3.38 |
| **936261** | AD2-033 C | 6.8 |
| **936262** | AD2-033 E | 4.53 |
| **936361** | AD2-046 C O1 | 8.68 |
| **936362** | AD2-046 E O1 | 3.99 |
| **936481** | AD2-063 C O1 | 8.7 |
| **936482** | AD2-063 E O1 | 5.8 |
| **936711** | AD2-090 C O1 | 7.38 |
| **936712** | AD2-090 E O1 | 4.92 |
| **937571** | AD2-169 C | 26.93 |
| **937572** | AD2-169 E | 17.95 |
| **938771** | AE1-103 C O2 | 2.41 |
| **938772** | AE1-103 E O2 | 3.32 |
| **939181** | AE1-148 C O2 | 8.4 |
| **939182** | AE1-148 E O2 | 5.6 |
| **CARR** | CARR | 0.04 |
| **CBM-S1** | CBM-S1 | 0.34 |
| **CBM-S2** | CBM-S2 | 0.31 |
| **CBM-W1** | CBM-W1 | 0.34 |
| **CBM-W2** | CBM-W2 | 2.22 |
| **CIN** | CIN | 0.17 |
| **CPLE** | CPLE | 0.12 |
| **G-007** | G-007 | 0.14 |
| **IPL** | IPL | 0.1 |
| **LGEE** | LGEE | 0.05 |
| **MEC** | MEC | 0.35 |
| **MECS** | MECS | 0.13 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **O-066** | O-066 | 0.47 |
| **RENSSELAER** | RENSSELAER | 0.03 |
| **WEC** | WEC | 0.04 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **294027** | 934330 | AD1-057 TAP | DVP | 313845 | 6HATHAWAY | DVP | 1 | DVP_P1-2: LN 238 | single | 441.8 | 99.75 | 100.09 | DC | 1.49 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314589** | 3MURPHYS | 0.05 |
| **314704** | 3LAWRENC | 0.21 |
| **315115** | 1S HAMPT1 | 0.73 |
| **315126** | 1ROARAP2 | 1.42 |
| **315128** | 1ROARAP4 | 1.37 |
| **315136** | 1ROSEMG1 | 5.27 |
| **315137** | 1ROSEMS1 | 3.27 |
| **315138** | 1ROSEMG2 | 2.47 |
| **315139** | 1GASTONA | 6.4 |
| **315141** | 1GASTONB | 6.4 |
| **315158** | 1KERR 1 | 0.14 |
| **315159** | 1KERR 2 | 0.56 |
| **315160** | 1KERR 3 | 0.56 |
| **315161** | 1KERR 4 | 0.56 |
| **315162** | 1KERR 5 | 0.56 |
| **315163** | 1KERR 6 | 0.56 |
| **315164** | 1KERR 7 | 0.56 |
| **917331** | Z2-043 C | 0.15 |
| **918491** | AA1-063AC OP | 1.16 |
| **918511** | AA1-065 C OP | 0.7 |
| **918561** | AA1-072 C | 0.02 |
| **919691** | AA2-053 C | 1.33 |
| **920041** | AA2-088 C OP | 0.65 |
| **920671** | AA2-174 C | 0.06 |
| **923801** | AB2-015 C O1 | 4.13 |
| **923911** | AB2-031 C O1 | 2.15 |
| **923991** | AB2-040 C O1 | 1.08 |
| **924021** | AB2-043 C O1 | 0.16 |
| **924161** | AB2-060 C O1 | 0.44 |
| **924301** | AB2-077 C O1 | 0.1 |
| **924311** | AB2-078 C O1 | 0.1 |
| **924321** | AB2-079 C O1 | 0.1 |
| **924401** | AB2-089 C | 1.16 |
| **924501** | AB2-099 C | 0.34 |
| **924511** | AB2-100 C | 25.42 |
| **925171** | AB2-174 C O1 | 6.51 |
| **925781** | AC1-054 C O1 | 4.39 |
| **926071** | AC1-086 C | 46.93 |
| **930861** | AB1-132 C O1 | 4.89 |
| **931231** | AB1-173 C | 0.33 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **931241** | AB1-173AC | 0.33 |
| **933991** | AD1-023 C | 4.9 |
| **934201** | AD1-047 C | 7.71 |
| **934231** | AD1-050 C | 2.56 |
| **934331** | AD1-057 C O1 | 38.45 |
| **934521** | AD1-076 C | 17.69 |
| **936361** | AD2-046 C O1 | 3.68 |
| **936401** | AD2-051 C O1 | 4.87 |
| **936711** | AD2-090 C O1 | 4.03 |
| **937571** | AD2-169 C | 10.0 |
| **938171** | AE1-026 C1 O | 11.18 |
| **938172** | AE1-026 C2 O | 1.62 |
| **938221** | AE1-035 C | 1.15 |
| **938771** | AE1-103 C O2 | 1.49 |
| **939071** | AE1-135 C O2 | 45.52 |
| **939181** | AE1-148 C O2 | 3.58 |
| **BAYOU** | BAYOU | 1.14 |
| **BIG_CAJUN1** | BIG_CAJUN1 | 1.79 |
| **BIG_CAJUN2** | BIG_CAJUN2 | 3.6 |
| **BLUEG** | BLUEG | 3.39 |
| **CALDERWOOD** | CALDERWOOD | 0.66 |
| **CANNELTON** | CANNELTON | 0.23 |
| **CARR** | CARR | 0.0 |
| **CATAWBA** | CATAWBA | 0.64 |
| **CHEOAH** | CHEOAH | 0.62 |
| **CHILHOWEE** | CHILHOWEE | 0.22 |
| **CHOCTAW** | CHOCTAW | 1.22 |
| **COFFEEN** | COFFEEN | 0.39 |
| **COTTONWOOD** | COTTONWOOD | 4.45 |
| **DEARBORN** | DEARBORN | 0.45 |
| **DUCKCREEK** | DUCKCREEK | 0.81 |
| **EDWARDS** | EDWARDS | 0.36 |
| **ELMERSMITH** | ELMERSMITH | 0.4 |
| **FARMERCITY** | FARMERCITY | 0.28 |
| **G-007A** | G-007A | 0.11 |
| **GIBSON** | GIBSON | 0.15 |
| **HAMLET** | HAMLET | 2.58 |
| **NEWTON** | NEWTON | 1.02 |
| **O-066A** | O-066A | 0.05 |
| **PRAIRIE** | PRAIRIE | 2.12 |
| **RENSSELAER** | RENSSELAER | 0.0 |
| **SANTEETLA** | SANTEETLA | 0.18 |
| **SMITHLAND** | SMITHLAND | 0.19 |
| **TATANKA** | TATANKA | 0.48 |
| **TILTON** | TILTON | 0.43 |
| **TRIMBLE** | TRIMBLE | 0.37 |
| **TVA** | TVA | 1.88 |
| **UNIONPOWER** | UNIONPOWER | 0.93 |
| **VFT** | VFT | 0.29 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292826** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 1 | DVP_P4-5: L1TL5 | breaker | 297.2 | 88.26 | 96.31 | DC | 23.93 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 6.35 |
| **314541** | 3WATKINS | 1.58 |
| **314589** | 3MURPHYS | 0.09 |
| **314617** | 3TUNIS | 0.59 |
| **315115** | 1S HAMPT1 | 3.14 |
| **900672** | V4-068 E | 0.33 |
| **907092** | X1-038 E | 15.88 |
| **920041** | AA2-088 C OP | 1.58 |
| **920042** | AA2-088 E OP | 16.86 |
| **923801** | AB2-015 C O1 | 20.96 |
| **923802** | AB2-015 E O1 | 17.19 |
| **924501** | AB2-099 C | 0.27 |
| **924502** | AB2-099 E | 0.11 |
| **925061** | AB2-161 C O1 | 7.91 |
| **925062** | AB2-161 E O1 | 12.9 |
| **932581** | AC2-078 C O1 | 4.76 |
| **932582** | AC2-078 E O1 | 7.76 |
| **932591** | AC2-079 C O1 | 17.59 |
| **932592** | AC2-079 E O1 | 28.7 |
| **934571** | AD1-082 C | 18.03 |
| **934572** | AD1-082 E | 10.28 |
| **936661** | AD2-085 C | 10.41 |
| **936662** | AD2-085 E | 16.98 |
| **936711** | AD2-090 C O1 | 14.78 |
| **936712** | AD2-090 E O1 | 9.85 |
| **938631** | AE1-085 C O2 | 13.99 |
| **938632** | AE1-085 E O2 | 9.33 |
| **938771** | AE1-103 C O2 | 10.05 |
| **938772** | AE1-103 E O2 | 13.88 |
| **938841** | AE1-109AC O2 | 23.21 |
| **938842** | AE1-109AE O2 | 15.48 |
| **939191** | AE1-149 C O2 | 9.12 |
| **939192** | AE1-149 E O2 | 6.08 |
| **940061** | AE1-248 C O2 | 37.12 |
| **940062** | AE1-248 E O2 | 24.74 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.4 |
| **CBM-S2** | CBM-S2 | 0.47 |
| **CBM-W1** | CBM-W1 | 0.4 |
| **CBM-W2** | CBM-W2 | 2.62 |
| **CIN** | CIN | 0.18 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **CPLE** | CPLE | 0.26 |
| **G-007** | G-007 | 0.07 |
| **IPL** | IPL | 0.11 |
| **LGEE** | LGEE | 0.05 |
| **MEC** | MEC | 0.4 |
| **MECS** | MECS | 0.17 |
| **O-066** | O-066 | 0.22 |
| **RENSSELAER** | RENSSELAER | 0.02 |
| **WEC** | WEC | 0.05 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292872** | 314536 | 3SUFFOLK | DVP | 314537 | 6SUFFOLK | DVP | 3 | DVP_P4-3: YTH5 | breaker | 307.0 | 84.66 | 92.25 | DC | 23.31 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 6.19 |
| **314541** | 3WATKINS | 1.54 |
| **314589** | 3MURPHYS | 0.09 |
| **314617** | 3TUNIS | 0.56 |
| **315115** | 1S HAMPT1 | 3.06 |
| **900672** | V4-068 E | 0.32 |
| **907092** | X1-038 E | 15.46 |
| **920041** | AA2-088 C OP | 1.54 |
| **920042** | AA2-088 E OP | 16.36 |
| **923801** | AB2-015 C O1 | 20.4 |
| **923802** | AB2-015 E O1 | 16.73 |
| **925061** | AB2-161 C O1 | 7.71 |
| **925062** | AB2-161 E O1 | 12.59 |
| **932581** | AC2-078 C O1 | 4.64 |
| **932582** | AC2-078 E O1 | 7.57 |
| **932591** | AC2-079 C O1 | 17.16 |
| **932592** | AC2-079 E O1 | 28.0 |
| **934571** | AD1-082 C | 17.58 |
| **934572** | AD1-082 E | 10.03 |
| **936661** | AD2-085 C | 10.15 |
| **936662** | AD2-085 E | 16.56 |
| **936711** | AD2-090 C O1 | 14.37 |
| **936712** | AD2-090 E O1 | 9.58 |
| **938631** | AE1-085 C O2 | 13.64 |
| **938632** | AE1-085 E O2 | 9.09 |
| **938771** | AE1-103 C O2 | 9.79 |
| **938772** | AE1-103 E O2 | 13.52 |
| **938841** | AE1-109AC O2 | 22.64 |
| **938842** | AE1-109AE O2 | 15.09 |
| **939191** | AE1-149 C O2 | 8.89 |
| **939192** | AE1-149 E O2 | 5.92 |
| **940061** | AE1-248 C O2 | 36.2 |
| **940062** | AE1-248 E O2 | 24.13 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.35 |
| **CBM-S2** | CBM-S2 | 0.41 |
| **CBM-W1** | CBM-W1 | 0.36 |
| **CBM-W2** | CBM-W2 | 2.31 |
| **CIN** | CIN | 0.16 |
| **CPLE** | CPLE | 0.22 |
| **G-007** | G-007 | 0.06 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **IPL** | IPL | 0.1 |
| **LGEE** | LGEE | 0.05 |
| **MEC** | MEC | 0.36 |
| **MECS** | MECS | 0.15 |
| **O-066** | O-066 | 0.19 |
| **RENSSELAER** | RENSSELAER | 0.01 |
| **WEC** | WEC | 0.04 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292696** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 2 | DVP_P4-2: 201262 | breaker | 208.0 | 147.85 | 148.85 | DC | 4.66 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 1.46 |
| **314541** | 3WATKINS | 0.52 |
| **314572** | 3EMPORIA | 0.18 |
| **314578** | 3HORNRTN | 2.81 |
| **314582** | 3KELFORD | 9.44 |
| **314589** | 3MURPHYS | 0.15 |
| **314603** | 3SCOT NK | 6.48 |
| **314617** | 3TUNIS | 2.15 |
| **314623** | 3WITAKRS | 0.69 |
| **315115** | 1S HAMPT1 | 1.1 |
| **315126** | 1ROARAP2 | 1.03 |
| **315128** | 1ROARAP4 | 0.99 |
| **900672** | V4-068 E | 0.55 |
| **907092** | X1-038 E | 3.65 |
| **917331** | Z2-043 C | 0.96 |
| **917332** | Z2-043 E | 2.68 |
| **917342** | Z2-044 E | 0.3 |
| **918491** | AA1-063AC OP | 2.41 |
| **918492** | AA1-063AE OP | 7.42 |
| **918561** | AA1-072 C | 0.14 |
| **918562** | AA1-072 E | 0.45 |
| **919691** | AA2-053 C | 1.86 |
| **919692** | AA2-053 E | 5.21 |
| **919701** | AA2-057 C | 5.23 |
| **919702** | AA2-057 E | 2.61 |
| **920041** | AA2-088 C OP | 1.08 |
| **920042** | AA2-088 E OP | 11.54 |
| **920591** | AA2-165 C | 0.11 |
| **920592** | AA2-165 E | 0.34 |
| **920671** | AA2-174 C | 0.09 |
| **920672** | AA2-174 E | 0.6 |
| **923801** | AB2-015 C O1 | 6.0 |
| **923802** | AB2-015 E O1 | 4.92 |
| **923911** | AB2-031 C O1 | 1.29 |
| **923912** | AB2-031 E O1 | 0.63 |
| **923992** | AB2-040 E O1 | 3.46 |
| **924401** | AB2-089 C | 0.89 |
| **924402** | AB2-089 E | 0.46 |
| **924501** | AB2-099 C | 1.76 |
| **924502** | AB2-099 E | 0.76 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **925171** | AB2-174 C O1 | 3.68 |
| **925172** | AB2-174 E O1 | 3.33 |
| **925781** | AC1-054 C O1 | 3.34 |
| **925782** | AC1-054 E O1 | 1.54 |
| **926201** | AC1-098 C | 9.29 |
| **926202** | AC1-098 E | 5.53 |
| **926211** | AC1-099 C | 3.11 |
| **926212** | AC1-099 E | 1.83 |
| **927141** | AC1-208 C | 9.21 |
| **927142** | AC1-208 E | 4.09 |
| **931232** | AB1-173 E | 0.61 |
| **931242** | AB1-173AE | 0.61 |
| **932631** | AC2-084 C | 13.24 |
| **932632** | AC2-084 E | 6.52 |
| **934201** | AD1-047 C | 4.61 |
| **934202** | AD1-047 E | 3.07 |
| **934231** | AD1-050 C | 1.97 |
| **934232** | AD1-050 E | 1.08 |
| **936401** | AD2-051 C O1 | 29.7 |
| **936402** | AD2-051 E O1 | 12.75 |
| **936711** | AD2-090 C O1 | 6.31 |
| **936712** | AD2-090 E O1 | 4.2 |
| **937571** | AD2-169 C | 6.32 |
| **937572** | AD2-169 E | 4.21 |
| **938174** | AE1-026 CBAT | 1.16 |
| **938175** | AE1-026 EBAT | 4.63 |
| **938661** | AE1-088 | 0.77 |
| **938771** | AE1-103 C O2 | 1.96 |
| **938772** | AE1-103 E O2 | 2.7 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.06 |
| **CBM-S2** | CBM-S2 | 0.03 |
| **CBM-W1** | CBM-W1 | 0.02 |
| **CBM-W2** | CBM-W2 | 0.35 |
| **CIN** | CIN | 0.02 |
| **DEARBORN** | DEARBORN | 0.01 |
| **G-007** | G-007 | 0.08 |
| **IPL** | IPL | 0.01 |
| **LGEE** | LGEE | 0.01 |
| **MEC** | MEC | 0.05 |
| **O-066** | O-066 | 0.25 |
| **RENSSELAER** | RENSSELAER | 0.02 |
| **WEC** | WEC | 0.0 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **292902** | 314568 | 3EARLEYS | DVP | 314569 | 6EARLEYS | DVP | 1 | DVP_P4-2: 217162 | breaker | 208.0 | 125.33 | 126.34 | DC | 4.67 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **314539** | 3UNCAMP | 1.46 |
| **314541** | 3WATKINS | 0.52 |
| **314578** | 3HORNRTN | 2.4 |
| **314582** | 3KELFORD | 9.59 |
| **314589** | 3MURPHYS | 0.15 |
| **314603** | 3SCOT NK | 6.48 |
| **314617** | 3TUNIS | 2.18 |
| **314623** | 3WITAKRS | 0.63 |
| **315115** | 1S HAMPT1 | 1.08 |
| **315126** | 1ROARAP2 | 0.86 |
| **315128** | 1ROARAP4 | 0.83 |
| **900672** | V4-068 E | 0.55 |
| **907092** | X1-038 E | 3.64 |
| **917331** | Z2-043 C | 0.98 |
| **917332** | Z2-043 E | 2.73 |
| **917342** | Z2-044 E | 0.27 |
| **918491** | AA1-063AC OP | 2.35 |
| **918492** | AA1-063AE OP | 7.23 |
| **918561** | AA1-072 C | 0.15 |
| **918562** | AA1-072 E | 0.45 |
| **919691** | AA2-053 C | 1.75 |
| **919692** | AA2-053 E | 4.89 |
| **919701** | AA2-057 C | 4.87 |
| **919702** | AA2-057 E | 2.43 |
| **920041** | AA2-088 C OP | 1.06 |
| **920042** | AA2-088 E OP | 11.24 |
| **920591** | AA2-165 C | 0.1 |
| **920592** | AA2-165 E | 0.32 |
| **920671** | AA2-174 C | 0.08 |
| **920672** | AA2-174 E | 0.56 |
| **923801** | AB2-015 C O1 | 5.93 |
| **923802** | AB2-015 E O1 | 4.86 |
| **923911** | AB2-031 C O1 | 0.99 |
| **923912** | AB2-031 E O1 | 0.49 |
| **923992** | AB2-040 E O1 | 2.66 |
| **924501** | AB2-099 C | 1.8 |
| **924502** | AB2-099 E | 0.77 |
| **925171** | AB2-174 C O1 | 2.75 |
| **925172** | AB2-174 E O1 | 2.49 |
| **925781** | AC1-054 C O1 | 2.75 |

| Bus # | Bus | MW Impact |
|---|---|---|
| **925782** | AC1-054 E O1 | 1.27 |
| **926201** | AC1-098 C | 9.12 |
| **926202** | AC1-098 E | 5.44 |
| **926211** | AC1-099 C | 3.06 |
| **926212** | AC1-099 E | 1.8 |
| **927141** | AC1-208 C | 8.65 |
| **927142** | AC1-208 E | 3.84 |
| **931232** | AB1-173 E | 0.47 |
| **931242** | AB1-173AE | 0.47 |
| **932631** | AC2-084 C | 13.01 |
| **932632** | AC2-084 E | 6.41 |
| **934201** | AD1-047 C | 3.55 |
| **934202** | AD1-047 E | 2.37 |
| **936401** | AD2-051 C O1 | 30.42 |
| **936402** | AD2-051 E O1 | 13.06 |
| **936711** | AD2-090 C O1 | 6.19 |
| **936712** | AD2-090 E O1 | 4.12 |
| **937571** | AD2-169 C | 4.99 |
| **937572** | AD2-169 E | 3.33 |
| **938174** | AE1-026 CBAT | 0.8 |
| **938175** | AE1-026 EBAT | 3.2 |
| **938771** | AE1-103 C O2 | 1.96 |
| **938772** | AE1-103 E O2 | 2.71 |
| **CARR** | CARR | 0.02 |
| **CBM-S1** | CBM-S1 | 0.03 |
| **CBM-S2** | CBM-S2 | 0.02 |
| **CBM-W2** | CBM-W2 | 0.17 |
| **CIN** | CIN | 0.0 |
| **DEARBORN** | DEARBORN | 0.01 |
| **G-007** | G-007 | 0.06 |
| **IPL** | IPL | 0.0 |
| **LGEE** | LGEE | 0.0 |
| **MEC** | MEC | 0.01 |
| **O-066** | O-066 | 0.21 |
| **RENSSELAER** | RENSSELAER | 0.02 |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-2: 201262** | CONTINGENCY 'DVP_P4-2: 201262' /* EARLEYS 230 KV<br>OPEN BRANCH FROM BUS 314266 TO BUS 314569 CKT 1 /* 6NORTHAMPTON230.00 - 6EARLEYS 230.00<br>OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 6NORTHAMPTON230.00 - 6ROA VAL 230.00<br>OPEN BUS 314266 /* ISLAND: 6NORTHAMPTON230.00<br>OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 1 /* 3EARLEYS 115.00 - 6EARLEYS 230.00<br>END |
| **DVP_P1-2: LN 1029-B** | CONTINGENCY 'DVP_P1-2: LN 1029-B'<br>OPEN BRANCH FROM BUS 925170 TO BUS 314615 CKT 1 /* AB2-174 TAP 115.00 - 3TREGOTP 115.00<br>END |
| **DVP_P4-5: L1TL5** | CONTINGENCY 'DVP_P4-5: L1TL5' /* SUFFOLK 115 KV<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 3 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>END |
| **DVP_P4-3: SUFFOLK H542** | CONTINGENCY 'DVP_P4-3: SUFFOLK H542' /* SUFFOLK 230 KV<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 3 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314537 TO BUS 314928 CKT 2 /* 6SUFFOLK 230.00 - 8SUFFOLK 500.00<br>END |
| **DVP_P4-2: 102952** | CONTINGENCY 'DVP_P4-2: 102952' /* CLUBHOUSE 115 KV<br>OPEN BRANCH FROM BUS 314312 TO BUS 314325 CKT 1 /* 3JARRATT 115.00 - 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314325 TO BUS 314562 CKT 1 /* 3PURDYSW 115.00 - 3CLUBHSE 115.00<br>OPEN BUS 314312 /* ISLAND: 3JARRATT 115.00<br>OPEN BUS 314325 /* ISLAND: 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314572 CKT 1 /* 3METCATP 115.00 - 3EMPORIA 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314588 CKT 1 /* 3METCATP 115.00 - 3METCALF 115.00<br>OPEN BRANCH FROM BUS 314572 TO BUS 925170 CKT 1 /* 3EMPORIA 115.00 - AB2-174 TAP 115.00 /* CONTINGENCY LINE ADDED FOR AE1 BUILD<br>OPEN BRANCH FROM BUS 314572 TO BUS 314863 CKT 1 /* 3EMPORIA 115.00 - 3EMPOR_1 115.00<br>OPEN BUS 314570 /* ISLAND: 3METCATP 115.00<br>OPEN BUS 314572 /* ISLAND: 3EMPORIA 115.00<br>OPEN BUS 314588 /* ISLAND: 3METCALF 115.00<br>OPEN BUS 314863 /* ISLAND: 3EMPOR_1 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314565 CKT Z1 /* 3CLUBHSE 115.00 - 3CLUBHSE71 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00<br>OPEN BUS 314562 /* 3CLUBHSE 115.00 KV<br>END |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-2: WT2171** | CONTINGENCY 'DVP_P4-2: WT2171' /* EARLEYS 230 KV<br>OPEN BRANCH FROM BUS 313709 TO BUS 314569 CKT Z1 /* 6HOLLOMAN 230.00 - 6EARLEYS 230.00<br>OPEN BUS 313709 /* ISLAND: 6HOLLOMAN 230.00<br>OPEN BUS 918511 /* ISLAND: AA1-065 C OP230.00<br>OPEN BUS 918512 /* ISLAND: AA1-065 E OP230.00<br>OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 1 /* 3EARLEYS 115.00 - 6EARLEYS 230.00<br>END |
| **DVP_P1-2: LN 238** | CONTINGENCY 'DVP_P1-2: LN 238'<br>OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /* 6CARSON 230.00 - 6SAPONY 230.00<br>OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /* 6SAPONY 230.00 - 6CLUBHSE 230.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00<br>OPEN BUS 314435 /* ISLAND: 6SAPONY 230.00<br>END |
| **DVP_P4-2: 217162** | CONTINGENCY 'DVP_P4-2: 217162' /* EARLEYS 230 KV<br>OPEN BRANCH FROM BUS 313709 TO BUS 314569 CKT Z1 /* 6HOLLOMAN 230.00 - 6EARLEYS 230.00<br>OPEN BUS 313709 /* ISLAND: 6HOLLOMAN 230.00<br>OPEN BUS 918511 /* ISLAND: AA1-065 C OP230.00<br>OPEN BUS 918512 /* ISLAND: AA1-065 E OP230.00<br>OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 2 /* 3EARLEYS 115.00 - 6EARLEYS 230.00<br>END |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-2: 7152** | CONTINGENCY 'DVP_P4-2: 7152' /* CLUBHOUSE 115 KV<br>OPEN BRANCH FROM BUS 314516 TO BUS 314676 CKT 1 /* 3BRUNWICK_1 115.00 - 3BRUNWICK 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314565 CKT Z1 /* 3CLUBHSE 115.00 - 3CLUBHSE71 115.00<br>OPEN BRANCH FROM BUS 314565 TO BUS 314693 CKT 1 /* 3CLUBHSE71 115.00 - 3FRMAN D 115.00<br>OPEN BRANCH FROM BUS 314565 TO BUS 314850 CKT 1 /* 3CLUBHSE71 115.00 - 3CLUBHSE71_1115.00<br>OPEN BRANCH FROM BUS 314675 TO BUS 314676 CKT 1 /* 3BRODNAX 115.00 - 3BRUNWICK 115.00<br>OPEN BRANCH FROM BUS 314676 TO BUS 314704 CKT 1 /* 3BRUNWICK 115.00 - 3LAWRENC 115.00<br>OPEN BRANCH FROM BUS 314693 TO BUS 314704 CKT 1 /* 3FRMAN D 115.00 - 3LAWRENC 115.00<br>OPEN BUS 314516 /* ISLAND: 3BRUNWICK_1 115.00<br>OPEN BUS 314565 /* ISLAND: 3CLUBHSE71 115.00<br>OPEN BUS 314676 /* ISLAND: 3BRUNWICK 115.00<br>OPEN BUS 314782 /* ISLAND: 2BRUNWICK 69.000<br>OPEN BUS 314785 /* ISLAND: 2DANLTWN 69.000<br>OPEN BUS 314786 /* ISLAND: 2GASBURG 69.000<br>OPEN BUS 314787 /* ISLAND: 2BRUNWICK2 69.000<br>OPEN BUS 314872 /* ISLAND: 2BRUNSWICKDP69.000<br>OPEN BUS 314693 /* ISLAND: 3FRMAN D 115.00<br>OPEN BUS 314704 /* ISLAND: 3LAWRENC 115.00<br>OPEN BUS 314850 /* ISLAND: 3CLUBHSE71_1115.00<br>OPEN BRANCH FROM BUS 314312 TO BUS 314325 CKT 1 /* 3JARRATT 115.00 - 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314325 TO BUS 314562 CKT 1 /* 3PURDYSW 115.00 - 3CLUBHSE 115.00<br>OPEN BUS 314312 /* ISLAND: 3JARRATT 115.00<br>OPEN BUS 314325 /* ISLAND: 3PURDYSW 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00<br>OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00<br>OPEN BUS 314562 /* 3CLUBHSE 115.00 KV<br>END |
| **DVP_P1-2: LN 1029-A** | CONTINGENCY 'DVP_P1-2: LN 1029-A'<br>OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314572 CKT 1 /* 3METCATP 115.00 - 3EMPORIA 115.00<br>OPEN BRANCH FROM BUS 314570 TO BUS 314588 CKT 1 /* 3METCATP 115.00 - 3METCALF 115.00<br>OPEN BRANCH FROM BUS 314572 TO BUS 925170 CKT 1 /* 3EMPORIA 115.00 - AB2-174 TAP 115.00<br>OPEN BRANCH FROM BUS 314572 TO BUS 314863 CKT 1 /* 3EMPORIA 115.00 - 3EMPOR_1 115.00<br>OPEN BUS 314570 /* ISLAND: 3METCATP 115.00<br>OPEN BUS 314572 /* ISLAND: 3EMPORIA 115.00<br>OPEN BUS 314588 /* ISLAND: 3METCALF 115.00<br>OPEN BUS 314863 /* ISLAND: 3EMPOR_1 115.00<br>END |

| Contingency Name | Contingency Defintion |
|---|---|
| **DVP_P4-3: YTH5** | CONTINGENCY 'DVP_P4-3: YTH5' /* SUFFOLK 230 KV<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 1 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00<br>OPEN BRANCH FROM BUS 314537 TO BUS 314928 CKT 1 /* 6SUFFOLK 230.00 - 8SUFFOLK 500.00<br>REMOVE SWSHUNT FROM BUS 314537<br>END |

# Short Circuit

## Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None

Contributions to previously identified circuit breakers found to be over-duty:

None

# Attachment 1

# Single Line Diagram