



**Generation Interconnection
Feasibility Study Report
for
Queue Project AE1-168
VICTORIA-MARTIN 115 KV
90 MW Capacity / 150 MW Energy**

April, 2019

Table Of Contents

Introduction	
Preface	
General	
Attachment Facilities	
Direct Connection Cost Estimate	
Non-Direct Connection Cost Estimate	
Schedule	
Transmission Owner Analysis	
Interconnection Customer Requirements	
Revenue Metering and SCADA Requirements	
Analysis : Summer Peak	
Generation Deliverability	
Multiple Facility	
Contribution to Previously Identified	
Analysis : Affected Systems	
Analysis : Short Circuit	
Online Diagram	

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.

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.

General

The IC has proposed a solar and storage generating facility located in Nottoway County, Virginia. The installed facilities will have a capability of 150 MW with 90 MW of this output being recognized by PJM as Capacity. The proposed in-service date for the AE1-168 project is 9/01/2021. This study does not imply an ITO commitment to either in-service date.

Queue Number	AE1-168
Project Name	VICTORIA-MARTIN 115 KV
Interconnection Customer	
State	Virginia
County	Nottoway
Transmission Owner	Dominion
MFO	150
MWE	150
MWC	90
Fuel	Solar
Basecase Study Year	2022

Point of Interconnection

AE1-168 will interconnect with the ITO transmission system via a new three breaker ring bus switching station that connects on the of Victoria DP Tap to Martin DP 115 kV line #1034. See one line in **Attachment 1**.

Cost Summary

The AE1-168 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	\$1,550,000
Direct Connection Network Upgrade	\$5,500,000
Non Direct Connection Network Upgrades	\$ 800,000
Total Costs	\$7,850,000

In addition, the AE1-168 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	\$218,730,000

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 \$550,000.

Transmission: Construct approximately one span of 115 kV Attachment line between the generation substation and a new AE1-168 Switching Station. The estimated cost for this work is \$1,000,000.

The estimated total cost of the Attachment Facilities is \$1,550,000. 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
Generator Substation	\$ 550,000
Transmission	\$1,000,000
Total Attachment Facility Costs	\$1,550,000

Direct Connection Cost Estimate

Substation: Establish the new 115 kV AE1-168 Switching Substation (interconnection substation). The estimated cost of this work scope is \$5,500,000. It is estimated to take 24-36 months to complete this work.

Non-Direct Connection Cost Estimate

Transmission: Install transmission structure in-line with transmission line to allow the proposed interconnection switching station to be interconnected with the transmission system. Estimated cost is \$800,000 and is estimated to take 24-30 months to complete.

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

The Queue Project AE1-168 was evaluated as a 150 MW (Capacity 90 MW) injection tapping the Victoria DP Tap to Martin DP Tap 115 kV line in the ITO area. Project AE1-168 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-168 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
772831	242631	05EDAN 1	AEP	242620	05DANVL2	AEP	1	DVP_P1-2: LN 556	single	402.0	97.34	98.52	DC	4.75
463473	314559	3CAROLNA	DVP	314561	6CAROLNA	DVP	1	DVP_P1-2: LN 1029-B	single	239.89	99.7	101.62	DC	4.6
463646	314691	3FARMVIL	DVP	314692	6FARMVIL	DVP	2	DVP_P1-2: LN 235-A	single	182.64	98.24	118.92	DC	37.78
463753	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P1-2: LN 22-A	single	199.0	104.33	109.21	DC	9.72
463754	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P1-2: LN 90	single	199.0	104.0	108.92	DC	9.78
464053	314747	6BREMO	DVP	314744	3BREMO	DVP	1	DVP_P1-2: LN 2028	single	269.78	100.71	103.01	DC	6.2
463604	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 570	single	718.0	95.59	97.16	DC	11.32

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
462810	936480	AD2-063 TAP	DVP	314681	3CHASCTY	DVP	1	DVP_P4-2: 235T298	breaker	239.0	97.14	103.09	DC	31.54

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
463589	313867	6BREMIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	126.66	129.82	DC	20.88
463590	313867	6BREMIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-A	single	661.76	122.19	125.34	DC	20.88
462745	314282	6CARSON	DVP	314285	6CHRL249	DVP	1	DVP_P4-2: 562T563	breaker	684.0	140.18	140.76	DC	8.72

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
462773	314285	6CHRL249	DVP	314316	6LOCKS	DVP	1	DVP_P4-2: 562T563	breaker	684.0	137.16	137.74	DC	8.72
463472	314559	3CAROLNA	DVP	314561	6CAROLNA	DVP	1	DVP_P1-2: LN 1029-A	single	239.89	106.73	108.64	DC	4.6
462576	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P4-6: CAROLIN T122	breaker	208.6	198.57	202.2	DC	16.75
462577	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P4-2: 2202	breaker	208.6	189.92	197.49	DC	15.79
463301	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-2: LN 130-A	single	182.64	122.43	127.15	DC	8.62
463302	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-3: 6CAROLNA-TX#4	single	182.64	110.73	115.76	DC	9.17
462911	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 556T591	breaker	699.0	116.92	120.54	DC	56.27
462912	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 511T556	breaker	699.0	116.9	120.53	DC	56.27
463640	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P1-2: LN 556	single	571.52	122.77	128.67	DC	33.74
462929	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2: 556T591	breaker	684.0	115.27	118.98	DC	56.29
462930	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2: 511T556	breaker	684.0	115.26	118.96	DC	56.29
463678	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P1-2: LN 556	single	559.3	121.93	127.97	DC	33.75
463702	314697	6SEDGE HILL	DVP	927250	AC1-221 TAP	DVP	1	DVP_P1-2: LN 556	single	674.92	111.16	114.25	DC	20.89
462686	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P4-6: CAROLIN T122	breaker	199.0	147.28	151.8	DC	19.89
462687	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P4-2: 2202	breaker	199.0	138.31	142.26	DC	17.39
464184	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P7-1: LN 22-90-A	tower	199.0	152.53	156.99	DC	19.66
464185	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P7-1: LN 22-90-B	tower	199.0	140.98	145.44	DC	19.66
463546	314747	6BREMO	DVP	313867	6BREMIST	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	128.99	132.14	DC	20.88
463547	314747	6BREMO	DVP	313867	6BREMIST	DVP	1	DVP_P1-2: LN 2027-A	single	661.76	124.52	127.67	DC	20.88
463624	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	122.85	126.0	DC	20.88
463625	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-A	single	661.76	118.39	121.55	DC	20.88
463603	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 556	single	718.0	114.29	117.2	DC	20.89
463950	934610	AD1-087 TAP	DVP	314697	6SEDGE HILL	DVP	1	DVP_P1-2: LN 556	single	814.98	104.59	105.77	DC	9.6

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
463941	313825	3PLYWOOD	DVP	314696	3SEEDGE HILL	DVP	1	DVP_P1-2: LN 33-B	operation	141.0	111.84	116.7	DC	15.19
463587	313867	6BREMODIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-B	operation	661.76	145.11	147.48	DC	34.81
463595	313867	6BREMODIST	DVP	314765	6MTEAGLE	DVP	1	Base Case	operation	661.76	100.08	101.88	DC	26.31
464062	313868	6CARTERV	DVP	933500	AC2-165 TAP	DVP	1	DVP_P1-2: LN 2028	operation	800.88	100.11	101.69	DC	27.9
464009	314310	6JUDES F	DVP	314322	6MDLTHAN	DVP	1	DVP_P1-2: LN 2028	operation	800.88	104.61	106.18	DC	27.89
463972	314333	6POWHATN	DVP	314310	6JUDES F	DVP	1	DVP_P1-2: LN 2028	operation	800.88	108.37	109.94	DC	27.89
463471	314559	3CAROLNA	DVP	314561	6CAROLNA	DVP	1	Base Case	operation	226.54	120.13	121.86	DC	8.61
463296	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-3: 6CAROLNA-TX#4	operation	182.64	184.79	188.57	DC	15.28
463300	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	Base Case	operation	176.81	140.87	144.17	DC	12.94
463639	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P1-2: LN 556	operation	571.52	140.19	144.62	DC	56.23
464075	314686	6CLOVER	DVP	934610	AD1-087 TAP	DVP	1	DVP_P1-2: LN 556	operation	814.98	100.34	101.24	DC	16.01
463880	314687	3CREWE	DVP	314701	3LONEPN	DVP	1	DVP_P1-2: LN 98-A	operation	269.78	68.39	123.97	DC	149.96
463645	314691	3FARMVIL	DVP	314692	6FARMVIL	DVP	2	DVP_P1-2: LN 235-A	operation	182.64	128.99	144.52	DC	62.96
463677	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P1-2: LN 556	operation	559.3	138.09	142.62	DC	56.25
463990	314696	3SEEDGE HILL	DVP	314697	6SEEDGE HILL	DVP	1	DVP_P1-3: 6SEEDGE HILL-TX#2	operation	226.73	104.21	108.2	DC	20.08
463701	314697	6SEEDGE HILL	DVP	927250	AC1-221 TAP	DVP	1	DVP_P1-2: LN 556	operation	674.92	138.1	140.44	DC	34.82
463747	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P1-2: LN 296-A	operation	199.0	130.52	134.13	DC	15.92
463748	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P1-2: LN 296-B	operation	199.0	130.52	134.13	DC	15.92
463752	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	Base Case	operation	199.0	119.51	122.78	DC	14.38
463847	314706	3MARTIN TAP	DVP	314687	3CREWE	DVP	1	DVP_P1-2: LN 98-A	operation	269.78	71.69	127.27	DC	149.96
464052	314707	3MORAN	DVP	314691	3FARMVIL	DVP	1	DVP_P1-2: LN 98-A	operation	203.98	70.07	103.2	DC	149.94
463908	314712	3OTTER R	DVP	314666	3ALTVSTA	DVP	1	DVP_P1-2: LN 556	operation	224.66	115.48	117.43	DC	9.7
463544	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	DVP_P1-2: LN 2027-B	operation	661.76	147.44	149.81	DC	34.81
463552	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	Base Case	operation	661.76	102.4	104.19	DC	26.31
464051	314747	6BREMO	DVP	313868	6CARTERV	DVP	1	DVP_P1-2: LN 2028	operation	800.88	100.81	102.39	DC	27.9
464054	314747	6BREMO	DVP	314744	3BREMO	DVP	1	DVP_P1-2: LN 2028	operation	269.78	100.33	102.07	DC	10.33
463622	314765	6MTEAGLE	DVP	314749	6CHARLV	DVP	1	DVP_P1-2: LN 2027-B	operation	661.76	142.01	144.39	DC	34.8
463291	314914	8MDLTHAN	DVP	314918	8NO ANNA	DVP	1	Base Case	operation	2442.12	131.82	132.28	DC	25.65
463843	924160	AB2-060 TAP	DVP	314267	3CHASCTY2	DVP	1	DVP_P1-2: LN 1034-A	operation	269.78	72.35	127.94	DC	149.96
463602	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 556	operation	718.0	144.05	146.25	DC	34.82

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
463605	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	Base Case	operation	542.0	97.1	100.51	DC	18.58
463981	933500	AC2-165 TAP	DVP	314333	6POWHATN	DVP	1	DVP_P1-2: LN 2028	operation	800.88	107.66	109.23	DC	27.9
463949	934610	AD1-087 TAP	DVP	314697	6SEDGE HILL	DVP	1	DVP_P1-2: LN 556	operation	814.98	113.93	114.82	DC	16.01
463841	939370	AE1-168 TAP	DVP	314706	3MARTIN TAP	DVP	1	DVP_P1-2: LN 98-A	operation	269.78	72.35	127.94	DC	149.96

System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
464053	5	6BREMO 230.0 kV - 3BREMO 115.0 kV Ckt 1	DVP Description : PJM baseline upgrade b2989: Install a second 230 -115 kV Transformer(224 MVA) approximately 1 mile north of Brema and tie 230 kV Line #2028(Brema – Charlottesville) and 115 kV Line #91 (Brema-Sherwood) together. A three breaker 230 kV ring bus will split Line #2028 into two lines and Line #91 will also be split into two lines with a new three breaker 115 kV ring bus. Install a temporary 230-115 kV transformer at Brema substation for the interim until the new substation is complete. The baseline project has an projected in-service date of 06/01/2019.	\$0
463546,463547	15	6BREMO 230.0 kV - 6BREMODIST 230.0 kV Ckt 1	DVP Description : Rebuild / Uprate Line 2028 0.13 mi Time Estimate : 13-18 Months	\$300,000
463646	3	3FARMVIL 115.0 kV - 6FARMVIL 230.0 kV Ckt 2	DVP Description : Replace Transformer; Install 224 MVA 230-115 kV Transformer Time Estimate : 24-30 Months	\$6,000,000
772831	1	05EDAN 1 138.0 kV - 05DANVL2 138.0 kV Ckt 1	AEP Description : Current Station Ratings: S/N: 287, S/E: 337 1) Replace Danville Bus, \$300k 2) Replace 2 Danville Switches (1200A), \$250k each 3) Replace 5 Danville Risers, \$500k 4) Replace 1 East Danville Riser, \$100k Time Estimate : 18-24 Months Cost : \$1,400,000	\$0
462576,462577,463301,463302	11	3CLUBHSE 115.0 kV - 6CLUBHSE 230.0 kV Ckt 1	DVP Description : Add a second 230/115kV transformer and three 230kV breakers to convert the 230kV arrangement into a ring bus at Clubhouse Time Estimate : 22-26 Months	\$11,000,000
462745	9	6CARSON 230.0 kV - 6CHRL249 230.0 kV Ckt 1	DVP Description : Wreck & rebuild Line 249 7.5 mi VA CPCN Time Estimate : 44-48 Months	\$18,500,000
462810	7	AD2-063 TAP 115.0 kV - 3CHASCTY 115.0 kV Ckt 1	DVP Description : Wreck & rebuild Line 1012 6.2 mi local approval Time Estimate : 30-36 Months	\$12,400,000
463589,463590	8	6BREMODIST 230.0 kV - 6MTEAGLE 230.0 kV Ckt 1	DVP Description : Rebuild / uprate Line2028 15 mi VA CPCN Time Estimate : 36-44 Months	\$37,500,000

ID	Index	Facility	Upgrade Description	Cost
463472,463473	2	3CAROLNA 115.0 kV - 6CAROLNA 230.0 kV Ckt 1	DVP Description : Add 2nd 230-115 kV Tx & Rearrange Substation site expansion Time Estimate : 24-30 Months	\$5,500,000
463702	14	6SEDGE HILL 230.0 kV - AC1-221 TAP 230.0 kV Ckt 1	DVP Description : The line rating at DVP side is 904MVA (normal), 904MVA (Emergency) and 1105 MVA (normal). Therefore, the line limit element is not overloaded.	\$0
462912,463640,462911	12	6BUCKING 230.0 kV - 6BREMO 230.0 kV Ckt 1	DVP Description : Wreck & rebuild Line 298 15.51 mi Va CPCN Time Estimate : 44-48 Months	\$38,780,000
463753,463754,464184,464185,462686,462687	4	3KERR 115.0 kV - 3GW KING TAP 115.0 kV Ckt 1	DVP Description : Line 45 Uprate from 90 deg C to 135 degree C Time Estimate : 24-30 Months Cost : \$3,000,000 CPL Description : The external (i.e. Non-PJM) Transmission Owner, CPL, will not evaluate this violation until the impact study phase.	\$3,000,000
463950	17	AD1-087 TAP 230.0 kV - 6SEDGE HILL 230.0 kV Ckt 1	DVP Description : Wreck & rebuild Line #2068 12 mi, Va CPCN Time Estimate : 30-36 Months	\$30,000,000
462929,462930,463678	13	6FARMVIL 230.0 kV - 6BUCKING 230.0 kV Ckt 1	DVP Description : Wreck & rebuild Line 298 12.7 mi Va CPCN Time Estimate : 44-48 Months	\$31,750,000
462773	10	6CHRL249 230.0 kV - 6LOCKS 230.0 kV Ckt 1	DVP Description : Wreck & rebuild Line 249 3 mi Va CPCN Time Estimate : 44-48 Months	\$7,500,000
463624,463625	16	6MTEAGLE 230.0 kV - 6CHARLVL 230.0 kV Ckt 1	DVP Description : Rebuild & uprate Line 2028 6.5 mi Va CPCN Time Estimate : 36-44 Months	\$16,500,000
463603,463604	6	AC1-221 TAP 230.0 kV - 6PERSON230 T 230.0 kV Ckt 1	DVP Description : The line rating at DVP side is 904MVA (normal), 904MVA (Emergency) and 1105 MVA (normal). Therefore, the line limit element is not overloaded at DVP side. CPL Description : No Violation. Facility loading does not exceed 100%.	\$0
			TOTAL COST	\$218,730,000

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 gauge 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
772831	242631	05EDAN 1	AEP	242620	05DANVL2	AEP	1	DVP_P1-2: LN 556	single	402.0	97.34	98.52	DC	4.75

Bus #	Bus	MW Impact
315131	1EDGECEMA	3.38
315132	1EDGECEMB	3.38
315150	1BUGGS 1	4.42
315151	1BUGGS 2	4.42
315153	1CLOVER1	4.89
315154	1CLOVER2	4.82
315158	1KERR 1	0.13
315159	1KERR 2	0.51
315160	1KERR 3	0.51
315161	1KERR 4	0.51
315162	1KERR 5	0.51
315163	1KERR 6	0.51
315164	1KERR 7	0.51
315266	1PLYWOOD A	0.49
917341	Z2-044 C	0.07
917511	Z2-088 C OP1	0.45
919701	AA2-057 C	2.42
920591	AA2-165 C	0.05
923941	AB2-035 C	0.12
924021	AB2-043 C O1	0.17
924151	AB2-059 C O1	0.59
924161	AB2-060 C O1	0.5
924301	AB2-077 C O1	0.11
924311	AB2-078 C O1	0.11
924321	AB2-079 C O1	0.11
924391	AB2-088 C	0.15
924401	AB2-089 C	0.81
925591	AC1-034 C	2.49
925611	AC1-036 C	0.05
925781	AC1-054 C O1	2.66
925991	AC1-075 C	2.03
926021	AC1-080 C	0.68
926051	AC1-083 C O1	4.14
926201	AC1-098 C	1.93
926211	AC1-099 C	0.65
926271	AC1-105 C O1	2.37
926761	AC1-162 C	8.82
927021	AC1-189 C	2.73
927141	AC1-208 C	2.9
927251	AC1-221 C	1.45

Bus #	Bus	MW Impact
927261	AC1-222 C	1.55
930401	AB1-081 C O1	0.5
932631	AC2-084 C	2.75
932761	AC2-100 C	3.34
932821	AC2-107 C	3.6
933941	AD1-017 C	0.83
934231	AD1-050 C	1.78
934311	AD1-055 C	1.08
934331	AD1-057 C O1	3.27
934341	AD1-058 C	3.63
934611	AD1-087 C O1	3.69
934621	AD1-088 C	4.65
934991	AD1-131 C	1.19
935171	AD1-152 C O1	3.67
935231	AD1-160 C	0.33
936161	AD2-022 C O1	10.09
936171	AD2-023 C O1	5.79
936261	AD2-033 C	4.38
936331	AD2-043 C	2.02
936361	AD2-046 C O1	3.44
936481	AD2-063 C O1	5.22
936531	AD2-068 C	1.79
936651	AD2-082 C	0.51
936701	AD2-089 C	2.47
937481	AD2-202 C O1	1.02
938371	AE1-056 C	1.94
939181	AE1-148 C O1	3.38
939371	AE1-168 C	4.75
940081	AE1-250 C	14.23
AA2-074	AA2-074	2.92
BLUEG	BLUEG	4.93
CANNELTON	CANNELTON	0.23
CBM-N	CBM-N	0.07
CBM-S2	CBM-S2	6.36
COFFEEN	COFFEEN	0.37
CPL	CPL	4.3
DEARBORN	DEARBORN	0.79
DUCKCREEK	DUCKCREEK	0.88
EDWARDS	EDWARDS	0.42
ELMERSMITH	ELMERSMITH	0.38
FARMERCITY	FARMERCITY	0.18
G-007A	G-007A	0.54
GIBSON	GIBSON	0.18
NEWTON	NEWTON	1.01
NYISO	NYISO	0.32
O-066A	O-066A	0.25
PRAIRIE	PRAIRIE	1.28
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.39
TILTON	TILTON	0.55
TRIMBLE	TRIMBLE	0.56
VFT	VFT	1.43

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
463472	314559	3CAROLNA	DVP	314561	6CAROLNA	DVP	1	DVP_P1-2: LN 1029-A	single	239.89	106.73	108.64	DC	4.6

Bus #	Bus	MW Impact
314589	3MURPHYS	0.09
315115	1S HAMPT1	1.31
315126	1ROARAP2	3.42
315128	1ROARAP4	3.29
315150	1BUGGS 1	6.59
315151	1BUGGS 2	6.59
315158	1KERR 1	0.3
315159	1KERR 2	1.24
315160	1KERR 3	1.22
315161	1KERR 4	1.22
315162	1KERR 5	1.22
315163	1KERR 6	1.22
315164	1KERR 7	1.22
917331	Z2-043 C	0.22
917341	Z2-044 C	0.08
918491	AA1-063AC OP	2.33
918561	AA1-072 C	0.03
919691	AA2-053 C	2.94
919701	AA2-057 C	4.8
920041	AA2-088 C OP	1.25
920591	AA2-165 C	0.1
920671	AA2-174 C	0.13
923801	AB2-015 C O1	7.22
923911	AB2-031 C O1	6.02
923991	AB2-040 C O1	3.03
924021	AB2-043 C O1	0.22
924161	AB2-060 C O1	0.63
924301	AB2-077 C O1	0.14
924311	AB2-078 C O1	0.14
924321	AB2-079 C O1	0.14
924401	AB2-089 C	2.63
924501	AB2-099 C	0.35
925171	AB2-174 C O1	18.86
925611	AC1-036 C	0.05
925781	AC1-054 C O1	10.08
926201	AC1-098 C	5.83
926211	AC1-099 C	1.95
927141	AC1-208 C	11.31
931231	AB1-173 C	0.93
931241	AB1-173AC	0.93

Bus #	Bus	MW Impact
932631	AC2-084 C	8.31
934201	AD1-047 C	21.56
934231	AD1-050 C	5.8
936261	AD2-033 C	4.94
936361	AD2-046 C O1	7.71
936401	AD2-051 C O1	3.91
936481	AD2-063 C O1	6.31
936711	AD2-090 C O1	7.43
937571	AD2-169 C	26.94
938771	AE1-103 C O1	2.68
939181	AE1-148 C O1	7.39
939371	AE1-168 C	4.6
CARR	CARR	0.04
CBM-S1	CBM-S1	0.24
CBM-S2	CBM-S2	0.23
CBM-W1	CBM-W1	0.21
CBM-W2	CBM-W2	1.49
CIN	CIN	0.11
CPL	CPL	0.09
IPL	IPL	0.07
LGEE	LGEE	0.03
MEC	MEC	0.23
MECS	MECS	0.06
RENSSELAER	RENSSELAER	0.03
WEC	WEC	0.03

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
463646	314691	3FARMVIL	DVP	314692	6FARMVIL	DVP	2	DVP_P1-2: LN 235-A	single	182.64	98.24	118.92	DC	37.78

Bus #	Bus	MW Impact
314429	3JTRSVLE	1.0
314704	3LAWRENC	0.19
315150	1BUGGS 1	9.74
315151	1BUGGS 2	9.74
315158	1KERR 1	0.26
315159	1KERR 2	1.05
315160	1KERR 3	1.03
315161	1KERR 4	1.03
315162	1KERR 5	1.03
315163	1KERR 6	1.03
315164	1KERR 7	1.03
315266	1PLYWOOD A	0.56
923911	AB2-031 C O1	0.73
923991	AB2-040 C O1	0.37
924021	AB2-043 C O1	0.6
924161	AB2-060 C O1	1.79
924301	AB2-077 C O1	0.37
924311	AB2-078 C O1	0.37
924321	AB2-079 C O1	0.37
924401	AB2-089 C	1.53
925171	AB2-174 C O1	2.32
925611	AC1-036 C	0.3
925781	AC1-054 C O1	4.85
925831	AC1-062	0.14
926271	AC1-105 C O1	3.12
927261	AC1-222 C	1.32
931231	AB1-173 C	0.11
931241	AB1-173AC	0.11
934201	AD1-047 C	2.6
934231	AD1-050 C	3.38
934311	AD1-055 C	0.91
935221	AD1-157 C	0.69
935231	AD1-160 C	3.31
936261	AD2-033 C	24.72
936331	AD2-043 C	1.71
936361	AD2-046 C O1	7.7
936481	AD2-063 C O1	23.29
936651	AD2-082 C	5.07
937571	AD2-169 C	3.18
938371	AE1-056 C	19.49

Bus #	Bus	MW Impact
939181	AE1-148 C O1	7.79
939201	AE1-150 C O1	36.82
939371	AE1-168 C	37.78
CARR	CARR	0.08
CBM-S1	CBM-S1	1.63
CBM-S2	CBM-S2	2.21
CBM-W1	CBM-W1	1.34
CBM-W2	CBM-W2	10.47
CIN	CIN	0.61
CPLE	CPLE	1.19
IPL	IPL	0.38
LGEE	LGEE	0.18
MEC	MEC	1.48
MECS	MECS	0.46
RENSSELAER	RENSSELAER	0.06
WEC	WEC	0.16

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
464184	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P7-1: LN 22-90-A	tower	199.0	152.53	156.99	DC	19.66

Bus #	Bus	MW Impact
315150	1BUGGS 1	15.54
315151	1BUGGS 2	15.54
315158	1KERR 1	0.7
315159	1KERR 2	2.85
315160	1KERR 3	2.81
315161	1KERR 4	2.81
315162	1KERR 5	2.81
315163	1KERR 6	2.81
315164	1KERR 7	2.81
924022	AB2-043 E O1	6.02
924162	AB2-060 E O1	4.91
924302	AB2-077 E O1	1.58
924312	AB2-078 E O1	1.58
924322	AB2-079 E O1	1.58
924401	AB2-089 C	4.63
924402	AB2-089 E	2.38
925612	AC1-036 E	1.43
925781	AC1-054 C O1	15.6
925782	AC1-054 E O1	7.18
926271	AC1-105 C O1	2.87
926272	AC1-105 E O1	1.43
934231	AD1-050 C	10.2
934232	AD1-050 E	5.57
935222	AD1-157 E	0.64
935231	AD1-160 C	0.7
935232	AD1-160 E	0.97
936261	AD2-033 C	12.59
936262	AD2-033 E	8.39
936361	AD2-046 C O1	17.92
936362	AD2-046 E O1	8.24
936481	AD2-063 C O1	16.07
936482	AD2-063 E O1	10.72
936651	AD2-082 C	1.08
936652	AD2-082 E	0.52
938371	AE1-056 C	4.14
938372	AE1-056 E	2.26
939181	AE1-148 C O1	17.24
939182	AE1-148 E O1	11.49
939201	AE1-150 C O1	4.43
939202	AE1-150 E O1	2.95

Bus #	Bus	MW Impact
939371	AE1-168 C	11.8
939372	AE1-168 E	7.86
BAYOU	BAYOU	0.71
BIG_CAJUN1	BIG_CAJUN1	1.12
BIG_CAJUN2	BIG_CAJUN2	2.24
BLUEG	BLUEG	1.98
CALDERWOOD	CALDERWOOD	0.42
CANNELTON	CANNELTON	0.14
CATAWBA	CATAWBA	0.43
CBM-N	CBM-N	0.0
CHEOAH	CHEOAH	0.39
CHILHOWEE	CHILHOWEE	0.14
CHOCTAW	CHOCTAW	0.76
COFFEEN	COFFEEN	0.23
COTTONWOOD	COTTONWOOD	2.77
DEARBORN	DEARBORN	0.25
DUCKCREEK	DUCKCREEK	0.48
EDWARDS	EDWARDS	0.21
ELMERSMITH	ELMERSMITH	0.24
FARMERCITY	FARMERCITY	0.17
G-007A	G-007A	0.09
GIBSON	GIBSON	0.09
HAMLET	HAMLET	1.64
NEWTON	NEWTON	0.61
NYISO	NYISO	0.02
O-066A	O-066A	0.04
PRAIRIE	PRAIRIE	1.28
SANTEETLA	SANTEETLA	0.12
SMITHLAND	SMITHLAND	0.11
TATANKA	TATANKA	0.29
TILTON	TILTON	0.25
TRIMBLE	TRIMBLE	0.22
TVA	TVA	1.17
UNIONPOWER	UNIONPOWER	0.59
VFT	VFT	0.22

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
464053	314747	6BREMO	DVP	314744	3BREMO	DVP	1	DVP_P1-2: LN 2028	single	269.78	100.71	103.01	DC	6.2

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.16
315191	1BEARGRDN G1	3.98
315192	1BEARGRDN G2	3.98
315193	1BEARGRDN S1	8.19
920291	AA2-127	0.83
923861	AB2-026 C	0.19
924031	AB2-045 C	0.28
925611	AC1-036 C	0.05
925831	AC1-062	0.02
926761	AC1-162 C	14.45
932511	AC2-071 C	0.28
933501	AC2-165 C	5.84
934621	AD1-088 C	4.53
935221	AD1-157 C	0.11
935231	AD1-160 C	0.53
936261	AD2-033 C	4.29
936651	AD2-082 C	0.81
938371	AE1-056 C	3.1
938561	AE1-075 C	1.08
939201	AE1-150 C O1	5.7
939371	AE1-168 C	6.2
BAYOU	BAYOU	0.29
BIG_CAJUN1	BIG_CAJUN1	0.43
BIG_CAJUN2	BIG_CAJUN2	0.86
BLUEG	BLUEG	2.56
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.14
CARR	CARR	0.01
CBM-S2	CBM-S2	0.62
CHEOAH	CHEOAH	0.11
CHILHOWEE	CHILHOWEE	0.04
CHOCTAW	CHOCTAW	0.28
COFFEEN	COFFEEN	0.24
COTTONWOOD	COTTONWOOD	1.19
CPL	CPL	0.55
DEARBORN	DEARBORN	0.4
DUCKCREEK	DUCKCREEK	0.53
EDWARDS	EDWARDS	0.25
ELMERSMITH	ELMERSMITH	0.24
FARMERCITY	FARMERCITY	0.15

Bus #	Bus	MW Impact
G-007A	G-007A	0.09
GIBSON	GIBSON	0.1
NEWTON	NEWTON	0.64
O-066A	O-066A	0.04
PRAIRIE	PRAIRIE	1.08
RENSSELAER	RENSSELAER	0.01
SANTEETLA	SANTEETLA	0.03
SMITHLAND	SMITHLAND	0.08
TATANKA	TATANKA	0.27
TILTON	TILTON	0.3
TRIMBLE	TRIMBLE	0.29
TVA	TVA	0.54
UNIONPOWER	UNIONPOWER	0.16
VFT	VFT	0.23

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
463603	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 556	single	718.0	114.29	117.2	DC	20.89

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.5
315150	1BUGGS 1	17.2
315151	1BUGGS 2	17.2
315153	1CLOVER1	35.07
315154	1CLOVER2	34.61
315159	1KERR 2	1.14
315162	1KERR 5	1.12
315163	1KERR 6	1.12
315164	1KERR 7	1.12
315165	1HURT 1	5.16
315166	1HURT 2	5.16
315266	1PLYWOOD A	2.96
924021	AB2-043 C O1	0.65
924031	AB2-045 C	0.38
924161	AB2-060 C O1	1.87
924301	AB2-077 C O1	0.42
924311	AB2-078 C O1	0.42
924321	AB2-079 C O1	0.42
924401	AB2-089 C	1.61
925611	AC1-036 C	0.2
925831	AC1-062	0.07
925991	AC1-075 C	11.93
926021	AC1-080 C	3.99
926271	AC1-105 C O1	14.49
926761	AC1-162 C	56.66
927251	AC1-221 C	11.73
927261	AC1-222 C	10.12
932511	AC2-071 C	0.37
932761	AC2-100 C	26.99
932821	AC2-107 C	21.21
934231	AD1-050 C	3.55
934311	AD1-055 C	7.02
934341	AD1-058 C	29.4
934611	AD1-087 C O1	26.93
934621	AD1-088 C	31.81
934991	AD1-131 C	9.64
935171	AD1-152 C O1	26.76
935221	AD1-157 C	0.32
935231	AD1-160 C	1.55
936261	AD2-033 C	17.81

Bus #	Bus	MW Impact
936331	AD2-043 C	13.11
936361	AD2-046 C O1	8.38
936481	AD2-063 C O1	20.34
936651	AD2-082 C	2.37
937481	AD2-202 C O1	7.42
938371	AE1-056 C	9.12
939181	AE1-148 C O1	8.48
939201	AE1-150 C O1	14.36
939371	AE1-168 C	20.89
AC1-133	AC1-133	20.69
BAYOU	BAYOU	2.62
BIG_CAJUN1	BIG_CAJUN1	4.15
BIG_CAJUN2	BIG_CAJUN2	8.35
BLUEG	BLUEG	6.71
CALDERWOOD	CALDERWOOD	1.58
CANNELTON	CANNELTON	0.47
CATAWBA	CATAWBA	1.69
CBM-N	CBM-N	0.03
CHEOAH	CHEOAH	1.48
CHILHOWEE	CHILHOWEE	0.51
CHOCTAW	CHOCTAW	2.83
COFFEEN	COFFEEN	0.81
COTTONWOOD	COTTONWOOD	10.24
DEARBORN	DEARBORN	0.83
DUCKCREEK	DUCKCREEK	1.65
EDWARDS	EDWARDS	0.73
ELMERSMITH	ELMERSMITH	0.84
FARMERCITY	FARMERCITY	0.6
G-007A	G-007A	0.32
GIBSON	GIBSON	0.29
HAMLET	HAMLET	6.38
NEWTON	NEWTON	2.11
NYISO	NYISO	0.14
O-066A	O-066A	0.14
PRAIRIE	PRAIRIE	4.54
SANTEETLA	SANTEETLA	0.44
SMITHLAND	SMITHLAND	0.41
TATANKA	TATANKA	1.0
TILTON	TILTON	0.86
TRIMBLE	TRIMBLE	0.73
TVA	TVA	4.32
UNIONPOWER	UNIONPOWER	2.22
VFT	VFT	0.83

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
462810	936480	AD2-063 TAP	DVP	314681	3CHASCTY	DVP	1	DVP_P4-2: 235T298	breaker	239.0	97.14	103.09	DC	31.54

Bus #	Bus	MW Impact
925611	AC1-036 C	0.72
925612	AC1-036 E	7.69
935221	AD1-157 C	0.86
935222	AD1-157 E	3.76
935231	AD1-160 C	4.13
935232	AD1-160 E	5.7
936261	AD2-033 C	8.51
936262	AD2-033 E	5.68
936481	AD2-063 C O1	83.99
936482	AD2-063 E O1	56.0
936651	AD2-082 C	6.33
936652	AD2-082 E	3.07
938371	AE1-056 C	24.3
938372	AE1-056 E	13.28
939201	AE1-150 C O1	29.15
939202	AE1-150 E O1	19.43
939371	AE1-168 C	18.92
939372	AE1-168 E	12.61
BAYOU	BAYOU	0.01
BIG_CAJUN1	BIG_CAJUN1	0.01
BIG_CAJUN2	BIG_CAJUN2	0.03
BLUEG	BLUEG	0.04
CALDERWOOD	CALDERWOOD	0.0
CANNELTON	CANNELTON	0.0
CARR	CARR	0.0
CATAWBA	CATAWBA	0.0
CHEOAH	CHEOAH	0.0
CHILHOWEE	CHILHOWEE	0.0
CHOCTAW	CHOCTAW	0.01
COFFEEN	COFFEEN	0.0
COTTONWOOD	COTTONWOOD	0.03
DEARBORN	DEARBORN	0.01
DUCKCREEK	DUCKCREEK	0.01
EDWARDS	EDWARDS	0.0
ELMERSMITH	ELMERSMITH	0.0
FARMERCITY	FARMERCITY	0.0
G-007	G-007	0.01
GIBSON	GIBSON	0.0
HAMLET	HAMLET	0.01
NEWTON	NEWTON	0.01

Bus #	Bus	MW Impact
O-066	O-066	0.03
PRAIRIE	PRAIRIE	0.02
RENSSELAER	RENSSELAER	0.0
SANTEETLA	SANTEETLA	0.0
SMITHLAND	SMITHLAND	0.0
TATANKA	TATANKA	0.01
TILTON	TILTON	0.01
TRIMBLE	TRIMBLE	0.0
TVA	TVA	0.01
UNIONPOWER	UNIONPOWER	0.01

Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
463589	313867	6BREMODIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	126.66	129.82	DC	20.88

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.54
315150	1BUGGS 1	7.33
315151	1BUGGS 2	7.33
315153	1CLOVER1	6.64
315154	1CLOVER2	6.55
315159	1KERR 2	0.77
315164	1KERR 7	0.76
315170	1BREMO 3	30.26
315171	1BREMO 4	66.48
315191	1BEARGRDN G1	13.63
315192	1BEARGRDN G2	13.63
315193	1BEARGRDN S1	28.05
920291	AA2-127	2.83
924021	AB2-043 C O1	0.39
924031	AB2-045 C	0.97
924161	AB2-060 C O1	1.15
924301	AB2-077 C O1	0.24
924311	AB2-078 C O1	0.24
924321	AB2-079 C O1	0.24
925611	AC1-036 C	0.17
925831	AC1-062	0.07
926271	AC1-105 C O1	3.21
926761	AC1-162 C	48.05
932511	AC2-071 C	0.95
933501	AC2-165 C	32.69
934621	AD1-088 C	14.59
935221	AD1-157 C	0.37
935231	AD1-160 C	1.78
936261	AD2-033 C	14.42
936361	AD2-046 C O1	5.5
936481	AD2-063 C O1	14.24
936651	AD2-082 C	2.73
938071	AE1-009 C O1	5.58
938371	AE1-056 C	10.47
938541	AE1-073 C	17.49
938821	AE1-108 C O1	38.05
939181	AE1-148 C O1	5.53
939201	AE1-150 C O1	19.26
939371	AE1-168 C	20.88
939841	AE1-220 C O1	12.08

Bus #	Bus	MW Impact
AA2-074	AA2-074	1.48
CARR	CARR	0.28
CBM-S1	CBM-S1	2.84
CBM-S2	CBM-S2	4.09
CBM-W1	CBM-W1	1.71
CBM-W2	CBM-W2	17.5
CIN	CIN	0.86
CPL	CPL	2.17
IPL	IPL	0.52
LGEE	LGEE	0.25
MEC	MEC	2.25
MECS	MECS	0.26
RENSSELAER	RENSSELAER	0.22
WEC	WEC	0.22

Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
462745	314282	6CARSON	DVP	314285	6CHRL249	DVP	1	DVP_P4-2: 562T563	breaker	684.0	140.18	140.76	DC	8.72

Bus #	Bus	MW Impact
314541	3WATKINS	0.23
314554	3BTLEBRO	0.4
314557	3BETHEL	0.39
314572	3EMPORIA	0.33
314574	6EVERETS	1.77
314578	3HORNRTN	1.92
314582	3KELFORD	1.62
314603	3SCOT NK	1.61
314617	3TUNIS	0.36
314620	6CASHIE	0.31
314623	3WITAKRS	0.69
314704	3LAWRENC	0.22
315102	1BRUNSWICKG1	4.2
315103	1BRUNSWICKG2	4.2
315104	1BRUNSWICKG3	4.2
315105	1BRUNSWICKS1	8.72
315131	1EDGECEMA	4.73
315132	1EDGECEMB	4.73
315136	1ROSEMG1	1.33
315137	1ROSEMS1	0.82
315138	1ROSEMG2	0.62
315139	1GASTONA	1.92
315141	1GASTONB	1.92
315150	1BUGGS 1	5.14
315151	1BUGGS 2	5.14
900672	V4-068 E	0.13
916301	Z1-086 C	25.59
916302	Z1-086 E	5.22
917332	Z2-043 E	0.46
917342	Z2-044 E	0.3
917512	Z2-088 E OP1	1.76
918492	AA1-063AE OP	2.11
918512	AA1-065 E OP	1.81
918532	AA1-067 E	0.31
918562	AA1-072 E	0.08
919692	AA2-053 E	2.08
919701	AA2-057 C	3.67
919702	AA2-057 E	1.83
920042	AA2-088 E OP	4.28
920592	AA2-165 E	0.24

Bus #	Bus	MW Impact
920672	AA2-174 E	0.24
923851	AB2-025 C	0.44
923852	AB2-025 E	1.3
923911	AB2-031 C O1	1.6
923912	AB2-031 E O1	0.79
923941	AB2-035 C	0.16
923942	AB2-035 E	0.07
923991	AB2-040 C O1	0.8
923992	AB2-040 E O1	4.29
924022	AB2-043 E O1	2.32
924152	AB2-059 E O1	2.75
924162	AB2-060 E O1	1.9
924302	AB2-077 E O1	0.6
924312	AB2-078 E O1	0.6
924322	AB2-079 E O1	0.6
924391	AB2-088 C	0.21
924392	AB2-088 E	0.1
924401	AB2-089 C	1.07
924402	AB2-089 E	0.55
924491	AB2-098 C	0.24
924492	AB2-098 E	0.1
924501	AB2-099 C	0.26
924502	AB2-099 E	0.11
924511	AB2-100 C	10.63
924512	AB2-100 E	5.23
925122	AB2-169 E	2.2
925171	AB2-174 C O1	5.2
925172	AB2-174 E O1	4.71
925591	AC1-034 C	3.46
925592	AC1-034 E	2.61
925612	AC1-036 E	0.6
925781	AC1-054 C O1	3.69
925782	AC1-054 E O1	1.7
926071	AC1-086 C	14.06
926072	AC1-086 E	6.4
926201	AC1-098 C	3.12
926202	AC1-098 E	1.86
926211	AC1-099 C	1.04
926212	AC1-099 E	0.61
926271	AC1-105 C O1	2.36
926272	AC1-105 E O1	1.18
927021	AC1-189 C	3.85
927022	AC1-189 E	1.92
927141	AC1-208 C	4.79
927142	AC1-208 E	2.13
927251	AC1-221 C	0.93
927252	AC1-221 E	0.93
927261	AC1-222 C	1.47
927262	AC1-222 E	1.4
930402	AB1-081 E O1	1.94
930861	AB1-132 C O1	1.46
930862	AB1-132 E O1	4.09

Bus #	Bus	MW Impact
931231	AB1-173 C	0.25
931232	AB1-173 E	0.75
931241	AB1-173AC	0.25
931242	AB1-173AE	0.75
932631	AC2-084 C	4.44
932632	AC2-084 E	2.19
932761	AC2-100 C	2.14
932762	AC2-100 E	1.04
933991	AD1-023 C	4.64
933992	AD1-023 E	2.53
934201	AD1-047 C	5.72
934202	AD1-047 E	3.81
934231	AD1-050 C	2.36
934232	AD1-050 E	1.29
934311	AD1-055 C	1.02
934312	AD1-055 E	0.26
934331	AD1-057 C O1	5.86
934332	AD1-057 E O1	3.13
934341	AD1-058 C	2.33
934342	AD1-058 E	0.59
934611	AD1-087 C O1	3.67
934612	AD1-087 E O1	1.73
934621	AD1-088 C	4.84
934622	AD1-088 E	2.27
934991	AD1-131 C	0.76
934992	AD1-131 E	0.51
935171	AD1-152 C O1	3.65
935172	AD1-152 E O1	2.43
935212	AD1-156 E	0.63
936261	AD2-033 C	5.16
936262	AD2-033 E	3.44
936331	AD2-043 C	1.92
936332	AD2-043 E	2.27
936361	AD2-046 C O1	4.25
936362	AD2-046 E O1	1.95
936401	AD2-051 C O1	3.84
936402	AD2-051 E O1	1.65
936481	AD2-063 C O1	6.37
936482	AD2-063 E O1	4.25
936531	AD2-068 C	2.27
936532	AD2-068 E	1.17
936701	AD2-089 C	3.47
936702	AD2-089 E	2.31
936711	AD2-090 C O1	2.58
936712	AD2-090 E O1	1.72
937481	AD2-202 C O1	1.01
937482	AD2-202 E O1	0.51
937571	AD2-169 C	6.85
937572	AD2-169 E	4.57
938171	AE1-026 C1 O	10.21
938172	AE1-026 C2 O	1.48
938173	AE1-026 E O1	3.08

Bus #	Bus	MW Impact
938221	AE1-035 C	0.92
938222	AE1-035 E	0.45
938491	AE1-068 C O1	33.33
938492	AE1-068 E O1	18.41
938501	AE1-069 C O1	26.06
938502	AE1-069 E O1	14.9
938661	AE1-088	0.67
939071	AE1-135 C O1	19.71
939072	AE1-135 E O1	13.14
939181	AE1-148 C O1	4.18
939182	AE1-148 E O1	2.78
939371	AE1-168 C	5.23
939372	AE1-168 E	3.49
939411	AE1-173 C	37.41
939412	AE1-173 E	24.94
AA2-074	AA2-074	2.63
CARR	CARR	0.31
CBM-S1	CBM-S1	6.67
CBM-S2	CBM-S2	7.56
CBM-W1	CBM-W1	6.65
CBM-W2	CBM-W2	43.74
CIN	CIN	3.01
CPL	CPL	3.87
G-007	G-007	1.05
IPL	IPL	1.89
LGEE	LGEE	0.87
MEC	MEC	6.71
MECS	MECS	2.79
O-066	O-066	3.49
RENSSELAER	RENSSELAER	0.24
WEC	WEC	0.81

Index 10

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
462773	314285	6CHRL249	DVP	314316	6LOCKS	DVP	1	DVP_P4-2: 562T563	breaker	684.0	137.16	137.74	DC	8.72

Bus #	Bus	MW Impact
314541	3WATKINS	0.23
314554	3BTLEBRO	0.4
314557	3BETHELC	0.39
314572	3EMPORIA	0.33
314574	6EVERETS	1.77
314578	3HORNRTN	1.92
314582	3KELFORD	1.62
314603	3SCOT NK	1.61
314617	3TUNIS	0.36
314620	6CASHIE	0.31
314623	3WITAKRS	0.69
314704	3LAWRENC	0.22
315102	1BRUNSWICKG1	4.2
315103	1BRUNSWICKG2	4.2
315104	1BRUNSWICKG3	4.2
315105	1BRUNSWICKS1	8.72
315131	1EDGECEMA	4.73
315132	1EDGECEMB	4.73
315136	1ROSEMG1	1.33
315137	1ROSEMS1	0.82
315138	1ROSEMG2	0.62
315139	1GASTONA	1.92
315141	1GASTONB	1.92
315150	1BUGGS 1	5.14
315151	1BUGGS 2	5.14
900672	V4-068 E	0.13
916301	Z1-086 C	25.59
916302	Z1-086 E	5.22
917332	Z2-043 E	0.46
917342	Z2-044 E	0.3
917512	Z2-088 E OP1	1.76
918492	AA1-063AE OP	2.11
918512	AA1-065 E OP	1.81
918532	AA1-067 E	0.31
918562	AA1-072 E	0.08
919692	AA2-053 E	2.08
919701	AA2-057 C	3.67
919702	AA2-057 E	1.83
920042	AA2-088 E OP	4.28
920592	AA2-165 E	0.24

Bus #	Bus	MW Impact
920672	AA2-174 E	0.24
923851	AB2-025 C	0.44
923852	AB2-025 E	1.3
923911	AB2-031 C O1	1.6
923912	AB2-031 E O1	0.79
923941	AB2-035 C	0.16
923942	AB2-035 E	0.07
923991	AB2-040 C O1	0.8
923992	AB2-040 E O1	4.29
924022	AB2-043 E O1	2.32
924152	AB2-059 E O1	2.75
924162	AB2-060 E O1	1.9
924302	AB2-077 E O1	0.6
924312	AB2-078 E O1	0.6
924322	AB2-079 E O1	0.6
924391	AB2-088 C	0.21
924392	AB2-088 E	0.1
924401	AB2-089 C	1.07
924402	AB2-089 E	0.55
924491	AB2-098 C	0.24
924492	AB2-098 E	0.1
924501	AB2-099 C	0.26
924502	AB2-099 E	0.11
924511	AB2-100 C	10.63
924512	AB2-100 E	5.23
925122	AB2-169 E	2.2
925171	AB2-174 C O1	5.2
925172	AB2-174 E O1	4.71
925591	AC1-034 C	3.46
925592	AC1-034 E	2.61
925612	AC1-036 E	0.6
925781	AC1-054 C O1	3.69
925782	AC1-054 E O1	1.7
926071	AC1-086 C	14.06
926072	AC1-086 E	6.4
926201	AC1-098 C	3.12
926202	AC1-098 E	1.86
926211	AC1-099 C	1.04
926212	AC1-099 E	0.61
926271	AC1-105 C O1	2.36
926272	AC1-105 E O1	1.18
927021	AC1-189 C	3.85
927022	AC1-189 E	1.92
927141	AC1-208 C	4.79
927142	AC1-208 E	2.13
927251	AC1-221 C	0.93
927252	AC1-221 E	0.93
927261	AC1-222 C	1.47
927262	AC1-222 E	1.4
930402	AB1-081 E O1	1.94
930861	AB1-132 C O1	1.46
930862	AB1-132 E O1	4.09

Bus #	Bus	MW Impact
931231	AB1-173 C	0.25
931232	AB1-173 E	0.75
931241	AB1-173AC	0.25
931242	AB1-173AE	0.75
932631	AC2-084 C	4.44
932632	AC2-084 E	2.19
932761	AC2-100 C	2.14
932762	AC2-100 E	1.04
933991	AD1-023 C	4.64
933992	AD1-023 E	2.53
934201	AD1-047 C	5.72
934202	AD1-047 E	3.81
934231	AD1-050 C	2.36
934232	AD1-050 E	1.29
934311	AD1-055 C	1.02
934312	AD1-055 E	0.26
934331	AD1-057 C O1	5.86
934332	AD1-057 E O1	3.13
934341	AD1-058 C	2.33
934342	AD1-058 E	0.59
934611	AD1-087 C O1	3.67
934612	AD1-087 E O1	1.73
934621	AD1-088 C	4.84
934622	AD1-088 E	2.27
934991	AD1-131 C	0.76
934992	AD1-131 E	0.51
935171	AD1-152 C O1	3.65
935172	AD1-152 E O1	2.43
935212	AD1-156 E	0.63
936261	AD2-033 C	5.16
936262	AD2-033 E	3.44
936331	AD2-043 C	1.92
936332	AD2-043 E	2.27
936361	AD2-046 C O1	4.25
936362	AD2-046 E O1	1.95
936401	AD2-051 C O1	3.84
936402	AD2-051 E O1	1.65
936481	AD2-063 C O1	6.37
936482	AD2-063 E O1	4.25
936531	AD2-068 C	2.27
936532	AD2-068 E	1.17
936701	AD2-089 C	3.47
936702	AD2-089 E	2.31
936711	AD2-090 C O1	2.58
936712	AD2-090 E O1	1.72
937481	AD2-202 C O1	1.01
937482	AD2-202 E O1	0.51
937571	AD2-169 C	6.85
937572	AD2-169 E	4.57
938171	AE1-026 C1 O	10.21
938172	AE1-026 C2 O	1.48
938173	AE1-026 E O1	3.08

Bus #	Bus	MW Impact
938221	AE1-035 C	0.92
938222	AE1-035 E	0.45
938491	AE1-068 C O1	33.33
938492	AE1-068 E O1	18.41
938501	AE1-069 C O1	26.06
938502	AE1-069 E O1	14.9
938661	AE1-088	0.67
939071	AE1-135 C O1	19.71
939072	AE1-135 E O1	13.14
939181	AE1-148 C O1	4.18
939182	AE1-148 E O1	2.78
939371	AE1-168 C	5.23
939372	AE1-168 E	3.49
939411	AE1-173 C	37.41
939412	AE1-173 E	24.94
AA2-074	AA2-074	2.63
CARR	CARR	0.31
CBM-S1	CBM-S1	6.67
CBM-S2	CBM-S2	7.56
CBM-W1	CBM-W1	6.65
CBM-W2	CBM-W2	43.74
CIN	CIN	3.01
CPL	CPL	3.87
G-007	G-007	1.05
IPL	IPL	1.89
LGEE	LGEE	0.87
MEC	MEC	6.71
MECS	MECS	2.79
O-066	O-066	3.49
RENSSELAER	RENSSELAER	0.24
WEC	WEC	0.81

Index 11

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
462576	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P4-6: CAROLIN T122	breaker	208.6	198.57	202.2	DC	16.75

Bus #	Bus	MW Impact
314572	3EMPORIA	1.98
314704	3LAWRENC	1.12
315150	1BUGGS 1	8.31
315151	1BUGGS 2	8.31
315158	1KERR 1	0.24
315159	1KERR 2	0.99
315160	1KERR 3	0.98
315161	1KERR 4	0.98
315162	1KERR 5	0.98
315163	1KERR 6	0.98
315164	1KERR 7	0.98
923911	AB2-031 C O1	10.64
923912	AB2-031 E O1	5.24
923991	AB2-040 C O1	5.36
923992	AB2-040 E O1	28.58
924021	AB2-043 C O1	0.48
924022	AB2-043 E O1	5.17
924161	AB2-060 C O1	1.37
924162	AB2-060 E O1	4.21
924301	AB2-077 C O1	0.3
924302	AB2-077 E O1	1.29
924311	AB2-078 C O1	0.3
924312	AB2-078 E O1	1.29
924321	AB2-079 C O1	0.3
924322	AB2-079 E O1	1.29
924401	AB2-089 C	1.61
924402	AB2-089 E	0.83
925171	AB2-174 C O1	33.34
925172	AB2-174 E O1	30.17
925611	AC1-036 C	0.11
925612	AC1-036 E	1.22
925781	AC1-054 C O1	5.43
925782	AC1-054 E O1	2.5
931231	AB1-173 C	1.64
931232	AB1-173 E	5.0
931241	AB1-173AC	1.64
931242	AB1-173AE	5.0
934201	AD1-047 C	38.11
934202	AD1-047 E	25.4
934231	AD1-050 C	3.55

Bus #	Bus	MW Impact
934232	AD1-050 E	1.94
936261	AD2-033 C	10.77
936262	AD2-033 E	7.18
936361	AD2-046 C O1	7.05
936362	AD2-046 E O1	3.24
936481	AD2-063 C O1	13.78
936482	AD2-063 E O1	9.19
937571	AD2-169 C	47.63
937572	AD2-169 E	31.76
939181	AE1-148 C O1	7.07
939182	AE1-148 E O1	4.71
939371	AE1-168 C	10.05
939372	AE1-168 E	6.7
CARR	CARR	0.04
CBM-S1	CBM-S1	0.53
CBM-S2	CBM-S2	0.43
CBM-W1	CBM-W1	0.63
CBM-W2	CBM-W2	3.54
CIN	CIN	0.29
CPL	CPL	0.17
G-007	G-007	0.13
IPL	IPL	0.19
LGEE	LGEE	0.09
MEC	MEC	0.59
MECS	MECS	0.29
O-066	O-066	0.44
RENSSELAER	RENSSELAER	0.03
WEC	WEC	0.08

Index 12

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
463640	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P1-2: LN 556	single	571.52	122.77	128.67	DC	33.74

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.87
315150	1BUGGS 1	13.25
315151	1BUGGS 2	13.25
315153	1CLOVER1	20.01
315154	1CLOVER2	19.75
315159	1KERR 2	1.3
315162	1KERR 5	1.28
315163	1KERR 6	1.28
315164	1KERR 7	1.28
315266	1PLYWOOD A	1.34
924021	AB2-043 C O1	0.66
924031	AB2-045 C	1.44
924161	AB2-060 C O1	1.95
924301	AB2-077 C O1	0.41
924311	AB2-078 C O1	0.41
924321	AB2-079 C O1	0.41
924401	AB2-089 C	1.91
925611	AC1-036 C	0.28
925781	AC1-054 C O1	6.06
925831	AC1-062	0.12
925991	AC1-075 C	4.95
926021	AC1-080 C	1.65
926271	AC1-105 C O1	6.76
926761	AC1-162 C	83.39
927251	AC1-221 C	1.65
927261	AC1-222 C	4.06
932511	AC2-071 C	1.42
932761	AC2-100 C	3.81
932821	AC2-107 C	8.8
934231	AD1-050 C	4.22
934311	AD1-055 C	2.82
934341	AD1-058 C	4.15
934611	AD1-087 C O1	12.04
934621	AD1-088 C	29.88
934991	AD1-131 C	1.36
935171	AD1-152 C O1	11.97
935221	AD1-157 C	0.6
935231	AD1-160 C	2.85
936261	AD2-033 C	23.74
936331	AD2-043 C	5.27

Bus #	Bus	MW Impact
936361	AD2-046 C O1	9.34
936481	AD2-063 C O1	23.81
936651	AD2-082 C	4.36
937481	AD2-202 C O1	3.32
938371	AE1-056 C	16.74
939181	AE1-148 C O1	9.39
939201	AE1-150 C O1	30.46
939371	AE1-168 C	33.74
AA2-074	AA2-074	2.33
CARR	CARR	0.24
CBM-S1	CBM-S1	5.29
CBM-S2	CBM-S2	6.51
CBM-W1	CBM-W1	4.91
CBM-W2	CBM-W2	34.29
CIN	CIN	2.24
CPLE	CPLE	3.43
IPL	IPL	1.4
LGEE	LGEE	0.65
MEC	MEC	5.12
MECS	MECS	1.93
RENSSELAER	RENSSELAER	0.19
WEC	WEC	0.6

Index 13

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
463678	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P1-2: LN 556	single	559.3	121.93	127.97	DC	33.75

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.87
315150	1BUGGS 1	13.25
315151	1BUGGS 2	13.25
315153	1CLOVER1	20.02
315154	1CLOVER2	19.76
315159	1KERR 2	1.3
315162	1KERR 5	1.28
315163	1KERR 6	1.28
315164	1KERR 7	1.28
315266	1PLYWOOD A	1.34
924021	AB2-043 C O1	0.66
924161	AB2-060 C O1	1.95
924301	AB2-077 C O1	0.41
924311	AB2-078 C O1	0.41
924321	AB2-079 C O1	0.41
924401	AB2-089 C	1.91
925611	AC1-036 C	0.28
925781	AC1-054 C O1	6.07
925831	AC1-062	0.12
925991	AC1-075 C	4.96
926021	AC1-080 C	1.66
926271	AC1-105 C O1	6.77
926761	AC1-162 C	83.41
927251	AC1-221 C	1.66
927261	AC1-222 C	4.07
932761	AC2-100 C	3.81
932821	AC2-107 C	8.81
934231	AD1-050 C	4.22
934311	AD1-055 C	2.82
934341	AD1-058 C	4.15
934611	AD1-087 C O1	12.05
934621	AD1-088 C	29.89
934991	AD1-131 C	1.36
935171	AD1-152 C O1	11.97
935221	AD1-157 C	0.6
935231	AD1-160 C	2.85
936261	AD2-033 C	23.75
936331	AD2-043 C	5.28
936361	AD2-046 C O1	9.35
936481	AD2-063 C O1	23.82

Bus #	Bus	MW Impact
936651	AD2-082 C	4.36
937481	AD2-202 C O1	3.32
938371	AE1-056 C	16.74
939181	AE1-148 C O1	9.4
939201	AE1-150 C O1	30.47
939371	AE1-168 C	33.75
AA2-074	AA2-074	2.34
CARR	CARR	0.24
CBM-S1	CBM-S1	5.33
CBM-S2	CBM-S2	6.54
CBM-W1	CBM-W1	4.99
CBM-W2	CBM-W2	34.62
CIN	CIN	2.28
CPLE	CPLE	3.44
IPL	IPL	1.42
LGEE	LGEE	0.66
MEC	MEC	5.18
MECS	MECS	1.98
RENSSELAER	RENSSELAER	0.19
WEC	WEC	0.61

Index 14

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
463702	314697	65EDGE HILL	DVP	927250	AC1-221 TAP	DVP	1	DVP_P1-2: LN 556	single	674.92	111.16	114.25	DC	20.89

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.5
315150	1BUGGS 1	17.2
315151	1BUGGS 2	17.2
315153	1CLOVER1	35.07
315154	1CLOVER2	34.61
315159	1KERR 2	1.14
315162	1KERR 5	1.12
315163	1KERR 6	1.12
315164	1KERR 7	1.12
315165	1HURT 1	5.16
315166	1HURT 2	5.16
315266	1PLYWOOD A	2.96
924021	AB2-043 C O1	0.65
924031	AB2-045 C	0.38
924161	AB2-060 C O1	1.87
924301	AB2-077 C O1	0.42
924311	AB2-078 C O1	0.42
924321	AB2-079 C O1	0.42
924401	AB2-089 C	1.61
925611	AC1-036 C	0.2
925661	AC1-042 C	1.59
925781	AC1-054 C O1	4.97
925831	AC1-062	0.07
925991	AC1-075 C	11.93
926021	AC1-080 C	3.99
926271	AC1-105 C O1	14.49
926641	AC1-145 C	1.9
926761	AC1-162 C	56.66
927261	AC1-222 C	10.12
932511	AC2-071 C	0.37
932821	AC2-107 C	21.21
934231	AD1-050 C	3.55
934311	AD1-055 C	7.02
934611	AD1-087 C O1	26.93
934621	AD1-088 C	31.81
935171	AD1-152 C O1	26.76
935221	AD1-157 C	0.32
935231	AD1-160 C	1.55
936261	AD2-033 C	17.81
936331	AD2-043 C	13.11

Bus #	Bus	MW Impact
936361	AD2-046 C O1	8.38
936481	AD2-063 C O1	20.34
936651	AD2-082 C	2.37
937481	AD2-202 C O1	7.42
938371	AE1-056 C	9.12
939181	AE1-148 C O1	8.48
939201	AE1-150 C O1	14.36
939371	AE1-168 C	20.89
939941	AE1-230 C1	0.72
AC1-133	AC1-133	20.69
BAYOU	BAYOU	2.62
BIG_CAJUN1	BIG_CAJUN1	4.15
BIG_CAJUN2	BIG_CAJUN2	8.35
BLUEG	BLUEG	6.71
CALDERWOOD	CALDERWOOD	1.58
CANNELTON	CANNELTON	0.47
CATAWBA	CATAWBA	1.69
CBM-N	CBM-N	0.03
CHEOAH	CHEOAH	1.48
CHILHOWEE	CHILHOWEE	0.51
CHOCTAW	CHOCTAW	2.83
COFFEEN	COFFEEN	0.81
COTTONWOOD	COTTONWOOD	10.24
DEARBORN	DEARBORN	0.83
DUCKCREEK	DUCKCREEK	1.65
EDWARDS	EDWARDS	0.73
ELMERSMITH	ELMERSMITH	0.84
FARMERCITY	FARMERCITY	0.6
G-007A	G-007A	0.32
GIBSON	GIBSON	0.29
HAMLET	HAMLET	6.38
NEWTON	NEWTON	2.11
NYISO	NYISO	0.14
O-066A	O-066A	0.14
PRAIRIE	PRAIRIE	4.54
SANTEETLA	SANTEETLA	0.44
SMITHLAND	SMITHLAND	0.41
TATANKA	TATANKA	1.0
TILTON	TILTON	0.86
TRIMBLE	TRIMBLE	0.73
TVA	TVA	4.32
UNIONPOWER	UNIONPOWER	2.22
VFT	VFT	0.83

Index 15

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
463546	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	128.99	132.14	DC	20.88

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.54
315150	1BUGGS 1	7.33
315151	1BUGGS 2	7.33
315153	1CLOVER1	6.64
315154	1CLOVER2	6.55
315159	1KERR 2	0.77
315164	1KERR 7	0.76
315170	1BREMO 3	30.26
315171	1BREMO 4	66.48
315191	1BEARGRDN G1	13.63
315192	1BEARGRDN G2	13.63
315193	1BEARGRDN S1	28.05
920291	AA2-127	2.83
924021	AB2-043 C O1	0.39
924031	AB2-045 C	0.97
924161	AB2-060 C O1	1.15
924301	AB2-077 C O1	0.24
924311	AB2-078 C O1	0.24
924321	AB2-079 C O1	0.24
925611	AC1-036 C	0.17
925831	AC1-062	0.07
926271	AC1-105 C O1	3.21
926761	AC1-162 C	48.05
932511	AC2-071 C	0.95
933501	AC2-165 C	32.69
934621	AD1-088 C	14.59
935221	AD1-157 C	0.37
935231	AD1-160 C	1.78
936261	AD2-033 C	14.42
936361	AD2-046 C O1	5.5
936481	AD2-063 C O1	14.24
936651	AD2-082 C	2.73
938071	AE1-009 C O1	5.58
938371	AE1-056 C	10.47
938541	AE1-073 C	17.49
938821	AE1-108 C O1	38.05
939181	AE1-148 C O1	5.53
939201	AE1-150 C O1	19.26
939371	AE1-168 C	20.88
939841	AE1-220 C O1	12.08

Bus #	Bus	MW Impact
AA2-074	AA2-074	1.48
CARR	CARR	0.28
CBM-S1	CBM-S1	2.84
CBM-S2	CBM-S2	4.09
CBM-W1	CBM-W1	1.71
CBM-W2	CBM-W2	17.5
CIN	CIN	0.86
CPL	CPL	2.17
IPL	IPL	0.52
LGEE	LGEE	0.25
MEC	MEC	2.25
MECS	MECS	0.26
RENSSELAER	RENSSELAER	0.22
WEC	WEC	0.22

Index 16

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
463624	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	122.85	126.0	DC	20.88

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.54
315150	1BUGGS 1	7.33
315151	1BUGGS 2	7.33
315153	1CLOVER1	6.64
315154	1CLOVER2	6.55
315159	1KERR 2	0.77
315164	1KERR 7	0.76
315170	1BREMO 3	30.25
315171	1BREMO 4	66.47
315191	1BEARGRDN G1	13.63
315192	1BEARGRDN G2	13.63
315193	1BEARGRDN S1	28.05
920291	AA2-127	2.83
924021	AB2-043 C O1	0.39
924031	AB2-045 C	0.97
924161	AB2-060 C O1	1.15
924301	AB2-077 C O1	0.24
924311	AB2-078 C O1	0.24
924321	AB2-079 C O1	0.24
925611	AC1-036 C	0.17
925831	AC1-062	0.07
926451	AC1-116 C	0.56
926761	AC1-162 C	48.05
932511	AC2-071 C	0.95
933501	AC2-165 C	32.69
934621	AD1-088 C	14.59
935221	AD1-157 C	0.37
935231	AD1-160 C	1.78
936261	AD2-033 C	14.42
936361	AD2-046 C O1	5.5
936481	AD2-063 C O1	14.24
936651	AD2-082 C	2.73
938071	AE1-009 C O1	5.58
938371	AE1-056 C	10.47
938541	AE1-073 C	17.49
938821	AE1-108 C O1	38.05
939181	AE1-148 C O1	5.53
939201	AE1-150 C O1	19.26
939371	AE1-168 C	20.88
939841	AE1-220 C O1	12.08

Bus #	Bus	MW Impact
AA2-074	AA2-074	1.47
CARR	CARR	0.28
CBM-S1	CBM-S1	2.83
CBM-S2	CBM-S2	4.08
CBM-W1	CBM-W1	1.7
CBM-W2	CBM-W2	17.43
CIN	CIN	0.85
CPL	CPL	2.17
IPL	IPL	0.52
LGEE	LGEE	0.25
MEC	MEC	2.24
MECS	MECS	0.24
RENSSELAER	RENSSELAER	0.23
WEC	WEC	0.22

Index 17

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
463950	934610	AD1-087 TAP	DVP	314697	6SEGE HILL	DVP	1	DVP_P1-2: LN 556	single	814.98	104.59	105.77	DC	9.6

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.28
315153	1CLOVER1	46.07
315154	1CLOVER2	45.46
315170	1BREMO 3	6.22
315171	1BREMO 4	13.68
315191	1BEARGRDN G1	2.78
315192	1BEARGRDN G2	2.78
315193	1BEARGRDN S1	5.71
920291	AA2-127	0.58
923861	AB2-026 C	0.12
924031	AB2-045 C	0.42
925611	AC1-036 C	0.06
925831	AC1-062	0.04
926451	AC1-116 C	0.04
926761	AC1-162 C	68.93
932511	AC2-071 C	0.41
932823	AC2-107 BAT	10.28
933501	AC2-165 C	3.9
934611	AD1-087 C O1	35.74
934621	AD1-088 C	40.53
935171	AD1-152 C O1	35.52
935221	AD1-157 C	0.21
935231	AD1-160 C	0.98
936261	AD2-033 C	4.2
936651	AD2-082 C	1.51
937481	AD2-202 C O1	9.84
938071	AE1-009 C O1	1.15
938371	AE1-056 C	5.79
938541	AE1-073 C	3.79
938561	AE1-075 C	0.7
938821	AE1-108 C O1	7.31
939201	AE1-150 C O1	12.39
939371	AE1-168 C	9.6
BAYOU	BAYOU	2.02
BIG_CAJUN1	BIG_CAJUN1	3.19
BIG_CAJUN2	BIG_CAJUN2	6.41
BLUEG	BLUEG	6.14
CALDERWOOD	CALDERWOOD	1.2
CANNELTON	CANNELTON	0.41
CATAWBA	CATAWBA	1.15

Bus #	Bus	MW Impact
CBM-N	CBM-N	0.02
CHEOAH	CHEOAH	1.12
CHILHOWEE	CHILHOWEE	0.39
CHOCTAW	CHOCTAW	2.16
COFFEEN	COFFEEN	0.71
COTTONWOOD	COTTONWOOD	7.93
DEARBORN	DEARBORN	0.79
DUCKCREEK	DUCKCREEK	1.46
EDWARDS	EDWARDS	0.65
ELMERSMITH	ELMERSMITH	0.73
FARMERCITY	FARMERCITY	0.5
G-007A	G-007A	0.27
GIBSON	GIBSON	0.26
HAMLET	HAMLET	4.23
NEWTON	NEWTON	1.84
NYISO	NYISO	0.07
O-066A	O-066A	0.12
PRAIRIE	PRAIRIE	3.8
SANTEETLA	SANTEETLA	0.33
SMITHLAND	SMITHLAND	0.33
TATANKA	TATANKA	0.86
TILTON	TILTON	0.77
TRIMBLE	TRIMBLE	0.68
TVA	TVA	3.37
UNIONPOWER	UNIONPOWER	1.66
VFT	VFT	0.7

Contingency Name	Contingency Definition
DVP_P1-2: LN 1029-B	CONTINGENCY 'DVP_P1-2: LN 1029-B' OPEN BRANCH FROM BUS 925170 TO BUS 314615 CKT 1 /* AB2-174 TAP 115.00 - 3TREGOTP 115.00 END
DVP_P1-2: LN 1029-A	CONTINGENCY 'DVP_P1-2: LN 1029-A' OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00 OPEN BRANCH FROM BUS 314570 TO BUS 314572 CKT 1 /* 3METCATP 115.00 - 3EMPORIA 115.00 OPEN BRANCH FROM BUS 314570 TO BUS 314588 CKT 1 /* 3METCATP 115.00 - 3METCALF 115.00 OPEN BRANCH FROM BUS 314572 TO BUS 925170 CKT 1 /* 3EMPORIA 115.00 - AB2-174 TAP 115.00 OPEN BRANCH FROM BUS 314572 TO BUS 314863 CKT 1 /* 3EMPORIA 115.00 - 3EMPOR_1 115.00 OPEN BUS 314570 /* ISLAND: 3METCATP 115.00 OPEN BUS 314572 /* ISLAND: 3EMPORIA 115.00 OPEN BUS 314588 /* ISLAND: 3METCALF 115.00 OPEN BUS 314863 /* ISLAND: 3EMPOR_1 115.00 END
DVP_P1-2: LN 90	CONTINGENCY 'DVP_P1-2: LN 90' OPEN BRANCH FROM BUS 314265 TO BUS 314584 CKT 1 /* 3FIVEFORKSDP115.00 - 3LITTLTN 115.00 OPEN BRANCH FROM BUS 314265 TO BUS 314673 CKT 1 /* 3FIVEFORKSDP115.00 - 3PALMERSPRNG115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314585 CKT 1 /* 3CAROLNA 115.00 - 3L GASTN 115.00 OPEN BRANCH FROM BUS 314584 TO BUS 314585 CKT 1 /* 3LITTLTN 115.00 - 3L GASTN 115.00 OPEN BUS 314265 /* ISLAND: 3FIVEFORKSDP115.00 OPEN BUS 314584 /* ISLAND: 3LITTLTN 115.00 OPEN BUS 314585 /* ISLAND: 3L GASTN 115.00 END
DVP_P4-2: 562T563	CONTINGENCY 'DVP_P4-2: 562T563' /* CARSON 500 KV OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /* 8CARSON 500.00 - 8SEPTA 500.00 OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN 500.00 END

Contingency Name	Contingency Definition
DVP_P1-2: LN 1034-A	CONTINGENCY 'DVP_P1-2: LN 1034-A' OPEN BRANCH FROM BUS 314432 TO BUS 314706 CKT 1 /* 3MARTIN DP 115.00 - 3MARTIN TAP 115.00 OPEN BRANCH FROM BUS 314687 TO BUS 314701 CKT 1 /* 3CREWE 115.00 - 3LONEPN 115.00 OPEN BRANCH FROM BUS 314687 TO BUS 314706 CKT 1 /* 3CREWE 115.00 - 3MARTIN TAP 115.00 OPEN BRANCH FROM BUS 314706 TO BUS 939370 CKT 1 /* 3MARTIN TAP 115.00 - AE1-168 TAP 115.00 OPEN BUS 314432 /* ISLAND: 3MARTIN DP 115.00 OPEN BUS 314687 /* ISLAND: 3CREWE 115.00 OPEN BUS 314706 /* ISLAND: 3MARTIN TAP 115.00 END
DVP_P1-3: 6CAROLNA-TX#4	CONTINGENCY 'DVP_P1-3: 6CAROLNA-TX#4' OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 230.00 END
DVP_P1-2: LN 130-A	CONTINGENCY 'DVP_P1-2: LN 130-A' OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* 3CAROLNA 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314595 TO BUS 314600 CKT 1 /* 3PL HILL 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314600 TO BUS 937570 CKT 1 /* 3PLHITP 115.00 - AD2-169 TAP 115.00 OPEN BUS 314595 /* ISLAND: 3PL HILL 115.00 OPEN BUS 314600 /* ISLAND: 3PLHITP 115.00 END
DVP_P1-2: LN 33-B	CONTINGENCY 'DVP_P1-2: LN 33-B' OPEN BRANCH FROM BUS 926270 TO BUS 314696 CKT 1 /* AC1-105 TAP 115.00 - 3SEDGE HILL 115.00 END
DVP_P1-2: LN 296-B	CONTINGENCY 'DVP_P1-2: LN 296-B' OPEN BRANCH FROM BUS 927250 TO BUS 314697 CKT 1 /* AC1-221 TAP T230.00 - 6SEDGE HILL 230.00 END
DVP_P1-2: LN 22-A	CONTINGENCY 'DVP_P1-2: LN 22-A' OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 314571 TO BUS 925780 CKT 1 /* 3EATON F 115.00 - AC1-054 TAP 115.00 OPEN BUS 314571 /* ISLAND: 3EATON F 115.00 END
DVP_P1-2: LN 2027-A	CONTINGENCY 'DVP_P1-2: LN 2027-A' OPEN BRANCH FROM BUS 313868 TO BUS 933500 CKT 1 /* 6CARTERV 230.00 - AC2-165 TAP 230.00 OPEN BRANCH FROM BUS 313868 TO BUS 314747 CKT 1 /* 6CARTERV 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314310 TO BUS 314333 CKT 1 /* 6JUDES F 230.00 - 6POWHATN 230.00 OPEN BUS 313868 /* ISLAND: 6CARTERV 230.00 END

Contingency Name	Contingency Definition
DVP_P1-2: LN 2027-B	CONTINGENCY 'DVP_P1-2: LN 2027-B' OPEN BRANCH FROM BUS 933500 TO BUS 314333 CKT 1 /* AC2-165 TAP 230.00 - 6POWHATN 230.00 OPEN BRANCH FROM BUS 314310 TO BUS 314322 CKT 1 /* 6JUDES F 230.00 - 6MDLTHAN 230.00 OPEN BRANCH FROM BUS 314310 TO BUS 314333 CKT 1 /* 6JUDES F 230.00 - 6POWHATN 230.00 OPEN BUS 314310 /* ISLAND: 6JUDES F 230.00 OPEN BUS 314333 /* ISLAND: 6POWHATN 230.00 END
DVP_P1-3: 6SEDGE HILL-TX#2	CONTINGENCY 'DVP_P1-3: 6SEDGE HILL-TX#2' OPEN BRANCH FROM BUS 314696 TO BUS 314697 CKT 2 /* 3SEDGE HILL 115.00 - 6SEDGE HILL 230.00 END
DVP_P4-2: 2202	CONTINGENCY 'DVP_P4-2: 2202' /* CAROLINA 115 KV OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 314571 TO BUS 925780 CKT 1 /* 3EATON F 115.00 - AC1-054 TAP 115.00 /* CONTINGENCY LINE ADDED FOR AE1 BUILD OPEN BUS 314571 /* ISLAND: 3EATON F 115.00 OPEN BRANCH FROM BUS 313722 TO BUS 314559 CKT 1 /* 3OCCONEECHEE115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314259 TO BUS 314559 CKT Z1 /* 3CAROL56_1 115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* 3CAROLNA 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 230.00 END
DVP_P1-2: LN 570	CONTINGENCY 'DVP_P1-2: LN 570' OPEN BRANCH FROM BUS 304183 TO BUS 918500 CKT 1 /* 8WAKE 500 TT500.00 - AA1-064 TAP 500.00 OPEN BRANCH FROM BUS 314935 TO BUS 918500 CKT 1 /* 8HERITAGE 500.00 - AA1-064 TAP 500.00 OPEN BUS 918500 /* ISLAND: AA1-064 TAP 500.00 END

Contingency Name	Contingency Definition
DVP_P4-6: CAROLIN T122	CONTINGENCY 'DVP_P4-6: CAROLIN T122' /* CAROLINA 115 KV OPEN BRANCH FROM BUS 314559 TO BUS 315126 CKT 1 /* 3CAROLNA 115.00 - 1ROARAP2 14.400 OPEN BRANCH FROM BUS 314559 TO BUS 315128 CKT 1 /* 3CAROLNA 115.00 - 1ROARAP4 14.400 OPEN BUS 315126 /* ISLAND: 1ROARAP2 14.400 OPEN BUS 315128 /* ISLAND: 1ROARAP4 14.400 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 313722 TO BUS 314559 CKT 1 /* 3OCCONEECHEE115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314259 TO BUS 314559 CKT Z1 /* 3CAROL56_1 115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314578 CKT 1 /* 3CAROLNA 115.00 - 3HORNRTN 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314585 CKT 1 /* 3CAROLNA 115.00 - 3L GASTN 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* 3CAROLNA 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 230.00 OPEN BUS 314559 /* 3CAROLNA 115.00 KV END
DVP_P1-2: LN 556	CONTINGENCY 'DVP_P1-2: LN 556' OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 1 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 2 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 3 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314906 TO BUS 314936 CKT 1 /* 8CLOVER 500.00 - 8RAWLINGS 500.00 OPEN BUS 314906 /* ISLAND: 8CLOVER 500.00 OPEN BUS 314915 /* ISLAND: 8CLOVER_STC 500.00 END
DVP_P1-2: LN 296-A	CONTINGENCY 'DVP_P1-2: LN 296-A' OPEN BRANCH FROM BUS 304070 TO BUS 927250 CKT 1 /* 6PERSON230 T230.00 - AC1-221 TAP 230.00 END
DVP_P7-1: LN 22-90-A	CONTINGENCY 'DVP_P7-1: LN 22-90-A' OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 314571 TO BUS 925780 CKT 1 /* 3EATON F 115.00 - AC1-054 TAP 115.00 OPEN BUS 314571 /* ISLAND: 3EATON F 115.00 OPEN BRANCH FROM BUS 314265 TO BUS 314584 CKT 1 /* 3FIVEFORKSDP115.00 - 3LITTLTN 115.00 OPEN BRANCH FROM BUS 314265 TO BUS 314673 CKT 1 /* 3FIVEFORKSDP115.00 - 3PALMERSPRNG115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314585 CKT 1 /* 3CAROLNA 115.00 - 3L GASTN 115.00 OPEN BRANCH FROM BUS 314584 TO BUS 314585 CKT 1 /* 3LITTLTN 115.00 - 3L GASTN 115.00 OPEN BUS 314265 /* ISLAND: 3FIVEFORKSDP115.00 OPEN BUS 314584 /* ISLAND: 3LITTLTN 115.00 OPEN BUS 314585 /* ISLAND: 3L GASTN 115.00 END

Contingency Name	Contingency Definition
DVP_P4-2: 556T591	CONTINGENCY 'DVP_P4-2: 556T591' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 1 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 2 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 3 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314906 TO BUS 314936 CKT 1 /* 8CLOVER 500.00 - 8RAWLINGS 500.00 OPEN BUS 314906 /* ISLAND: 8CLOVER 500.00 OPEN BUS 314915 /* ISLAND: 8CLOVER_STC 500.00 OPEN BRANCH FROM BUS 314935 TO BUS 314936 CKT 1 /* 8HERITAGE 500.00 - 8RAWLINGS 500.00 END
DVP_P7-1: LN 22-90-B	CONTINGENCY 'DVP_P7-1: LN 22-90-B' OPEN BRANCH FROM BUS 925780 TO BUS 314702 CKT 1 /* AC1-054 TAP 115.00 - 3KERR 115.00 OPEN BRANCH FROM BUS 314265 TO BUS 314584 CKT 1 /* 3FIVEFORKSDP115.00 - 3LITTLTN 115.00 OPEN BRANCH FROM BUS 314265 TO BUS 314673 CKT 1 /* 3FIVEFORKSDP115.00 - 3PALMERSPRNG115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314585 CKT 1 /* 3CAROLNA 115.00 - 3L GASTN 115.00 OPEN BRANCH FROM BUS 314584 TO BUS 314585 CKT 1 /* 3LITTLTN 115.00 - 3L GASTN 115.00 OPEN BUS 314265 /* ISLAND: 3FIVEFORKSDP115.00 OPEN BUS 314584 /* ISLAND: 3LITTLTN 115.00 OPEN BUS 314585 /* ISLAND: 3L GASTN 115.00 END
Base Case	
DVP_P1-2: LN 2028	CONTINGENCY 'DVP_P1-2: LN 2028' OPEN BRANCH FROM BUS 313867 TO BUS 314747 CKT 1 /* 6BREMIST 230.00 - 6BREMIST 230.00 OPEN BRANCH FROM BUS 313867 TO BUS 314765 CKT 1 /* 6BREMIST 230.00 - 6MTEAGLE 230.00 OPEN BRANCH FROM BUS 314749 TO BUS 314765 CKT 1 /* 6CHARVL 230.00 - 6MTEAGLE 230.00 OPEN BUS 313867 /* ISLAND: 6BREMIST 230.00 OPEN BUS 314765 /* ISLAND: 6MTEAGLE 230.00 END
DVP_P1-2: LN 98-A	CONTINGENCY 'DVP_P1-2: LN 98-A' OPEN BRANCH FROM BUS 314267 TO BUS 924160 CKT 1 /* 3CHASCTY2 115.00 - AB2-060 TAP 115.00 END

Contingency Name	Contingency Definition
DVP_P4-2: 235T298	CONTINGENCY 'DVP_P4-2: 235T298' /* FARMVILLE 230 KV OPEN BRANCH FROM BUS 313802 TO BUS 314268 CKT 1 /* 6PRINCE EDW 230.00 - 6BRIERY 230.00 OPEN BRANCH FROM BUS 313802 TO BUS 314692 CKT 1 /* 6PRINCE EDW 230.00 - 6FARMVIL 230.00 OPEN BRANCH FROM BUS 314268 TO BUS 926760 CKT 1 /* 6BRIERY 230.00 - AC1-162 TAP 230.00 /* CONTINGENCY LINE ADDED FOR AE1 BUILD OPEN BRANCH FROM BUS 314691 TO BUS 314692 CKT 1 /* 3FARMVIL 115.00 - 6FARMVIL 230.00 OPEN BUS 313802 /* ISLAND: 6PRINCE EDW 230.00 OPEN BUS 314268 /* ISLAND: 6BRIERY 230.00 OPEN BRANCH FROM BUS 314677 TO BUS 314692 CKT 1 /* 6BUCKING 230.00 - 6FARMVIL 230.00 OPEN BRANCH FROM BUS 314677 TO BUS 314747 CKT 1 /* 6BUCKING 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314691 TO BUS 314692 CKT 2 /* 3FARMVIL 115.00 - 6FARMVIL 230.00 OPEN BUS 314677 /* ISLAND: 6BUCKING 230.00 END
DVP_P4-2: 511T556	CONTINGENCY 'DVP_P4-2: 511T556' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 314902 TO BUS 314936 CKT 1 /* 8CARSON 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 1 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 2 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314686 TO BUS 314906 CKT 3 /* 6CLOVER 230.00 - 8CLOVER 500.00 OPEN BRANCH FROM BUS 314906 TO BUS 314936 CKT 1 /* 8CLOVER 500.00 - 8RAWLINGS 500.00 OPEN BUS 314906 /* ISLAND: 8CLOVER 500.00 OPEN BUS 314915 /* ISLAND: 8CLOVER_STC 500.00 END
DVP_P1-2: LN 235-A	CONTINGENCY 'DVP_P1-2: LN 235-A' OPEN BRANCH FROM BUS 313802 TO BUS 314268 CKT 1 /* 6PRINCE EDW 230.00 - 6BRIERY 230.00 OPEN BRANCH FROM BUS 313802 TO BUS 314692 CKT 1 /* 6PRINCE EDW 230.00 - 6FARMVIL 230.00 OPEN BRANCH FROM BUS 314268 TO BUS 926760 CKT 1 /* 6BRIERY 230.00 - AC1-162 TAP 230.00 OPEN BRANCH FROM BUS 314691 TO BUS 314692 CKT 1 /* 3FARMVIL 115.00 - 6FARMVIL 230.00 OPEN BUS 313802 /* ISLAND: 6PRINCE EDW 230.00 OPEN BUS 314268 /* ISLAND: 6BRIERY 230.00 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

