



**Generation Interconnection
Feasibility Study Report
for**

Queue Project AE1-056

RED HOUSE-SOUTH CREEK 115 KV

38.8 MW Capacity / 60 MW Energy

January, 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 : 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.

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 Appomattox County, Virginia. The installed facilities will have a capability of 60 MW with 38.8 MW of this output being recognized by PJM as Capacity. The proposed in-service date for the AE1-056 project is 12/15/2020. This study does not imply an ITO commitment to either in-service date.

Queue Number	AE1-056
Project Name	RED HOUSE-SOUTH CREEK 115 KV
Interconnection Customer	
State	Virginia
County	Appomattox
Transmission Owner	Dominion
MFO	60
MWE	60
MWC	38.8
Fuel	Solar
Basecase Study Year	2022

Point of Interconnection

AE1-056 will interconnect with the Dominion transmission system via a new three breaker ring bus switching station that connects on the Red House DP – South Creek 115kV line near the South Creek 115 kV substation. See one line in **Attachment 1**.

Cost Summary

The AE1-056 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	\$1,000,000
Total Costs	\$8,050,000

In addition, the AE1-056 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	\$145,730,000

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 is \$550,000.

Transmission: Construct approximately one span of 115 kV Attachment line between the generation substation and a new AE1-056 Switching Station near the South Creek 115kV substation. 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
Substation	\$550,000
Transmission	\$1,000,000
Total Attachment Facility Costs	\$1,550,000

Direct Connection Cost Estimate

Substation: Establish the new 115 kV AE1-056 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 \$1,000,000 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 AE1-056 was evaluated as a 60 MW (Capacity 38.8 MW) injection at the South Creek 115 kV substation in the ITO area. Project AE1-056 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-056 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)

None

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
88872	936480	AD2-063 TAP	DVP	314681	3CHASCTY	DVP	1	DVP_P4-4: 8442	breaker	239.0	77.0	102.1	DC	60.0

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
89256	313867	6BREMIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	112.03	113.61	DC	10.48
89257	313867	6BREMIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-A	single	661.76	109.26	110.85	DC	10.48
89018	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-3: 6CAROLNA-TX#4	single	182.64	106.93	107.72	DC	3.2
88816	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 556T591	breaker	699.0	104.31	108.01	DC	25.9
88817	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 511T556	breaker	699.0	104.31	108.01	DC	25.9
88818	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 511T591	breaker	699.0	104.11	107.81	DC	25.9
89253	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P1-2: LN 556	single	571.52	113.18	116.11	DC	16.74
88827	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2: 556T591	breaker	684.0	102.4	106.19	DC	25.91
88828	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2: 511T556	breaker	684.0	102.4	106.19	DC	25.91
88829	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2: 511T591	breaker	684.0	102.19	105.98	DC	25.91
89277	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P1-2: LN 556	single	559.3	112.17	115.16	DC	16.74
89228	314697	6SEGE HILL	DVP	927250	AC1-221 TAP	DVP	1	DVP_P1-2: LN 556	single	674.92	105.95	107.3	DC	9.13
88707	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P4-6: CAROLIN T122	breaker	199.0	127.23	128.71	DC	6.48
88708	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P4-2: 2202	breaker	199.0	120.4	121.69	DC	5.66
89579	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P7-1: LN 22-90-A	tower	199.0	132.6	134.06	DC	6.41

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
89580	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P7-1: LN 22-90-B	tower	199.0	121.1	122.56	DC	6.41
89236	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	114.35	115.94	DC	10.48
89237	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	DVP_P1-2: LN 2027-A	single	661.76	111.59	113.17	DC	10.48
89290	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	108.29	109.87	DC	10.47
89291	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-A	single	661.76	104.25	105.84	DC	10.47
89186	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 556	single	718.0	109.39	110.66	DC	9.13

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
89478	313825	3PLYWOOD	DVP	314696	3SEGE HILL	DVP	1	DVP_P1-2: LN 33-B	operation	141.0	99.4	100.94	DC	4.79
89254	313867	6BREMODIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-B	operation	661.76	122.19	124.64	DC	16.2
89014	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-3: 6CAROLNA-TX#4	operation	182.64	176.02	177.25	DC	4.94
89017	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	Base Case	operation	176.81	134.93	136.0	DC	4.19
89252	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P1-2: LN 556	operation	571.52	124.78	129.31	DC	25.88
89276	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P1-2: LN 556	operation	559.3	122.38	127.01	DC	25.89
89227	314697	6SEGE HILL	DVP	927250	AC1-221 TAP	DVP	1	DVP_P1-2: LN 556	operation	674.92	130.84	132.93	DC	14.11
89347	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	DVP_P1-2: LN 151	operation	199.0	114.12	115.33	DC	5.29
89352	314702	3KERR	DVP	304102	3GW KING TAP	CPL	1	Base Case	operation	199.0	104.25	105.32	DC	4.69
89374	314712	3OTTER R	DVP	314666	3ALTVSTA	DVP	1	DVP_P1-2: LN 556	operation	224.66	110.77	111.48	DC	3.56
89234	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	DVP_P1-2: LN 2027-B	operation	661.76	124.52	126.97	DC	16.2
89288	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-B	operation	661.76	119.17	121.62	DC	16.2
89185	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 556	operation	718.0	137.23	139.19	DC	14.11

89379	934610	AD1-087 TAP	DVP	314697	6SEDGE HILL	DVP	1	DVP_P1-2: LN 556	operation	814.98	109.94	111.05	DC	8.96
89472	936480	AD2-063 TAP	DVP	314681	3CHASCTY	DVP	1	DVP_P1-2: LN 84	operation	224.66	74.97	101.68	DC	60.0

System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
88827,88828,88829,89277	5	6FARMVIL 230.0 kV - 6BUCKING 230.0 kV Ckt 1	Description : Wreck & Rebuild 12.7 miles of 230kV Line # 298 between Buckingham and Farmville substations. A VA CPCN will be required. Time Estimate : 44-48 Months Cost : \$31,750,000	\$31,750,000
89018	3	3CLUBHSE 115.0 kV - 6CLUBHSE 115.0 kV Ckt 1	Description : Replace Clubhouse 230 / 115kV Transformer #1 with higher rating. Time Estimate : 12-16 Months Cost : \$5,500,000	\$5,500,000
89580,88707,88708,89579	7	3KERR 115.0 kV - 3GW KING TAP 115.0 kV Ckt 1	<u>Dominion</u> Description : Uprate 115kV Line # 45 between Kerr Dam and the ITO / Duke interface from 90 degree C to 125 degree C. Time Estimate : 24-30 Months Cost : \$3,000,000 <u>CPL</u> Description : The external (i.e. Non-PJM) Transmission Owner, Duke / CPL, will not evaluate this violation until the impact study phase.	\$3,000,000
89236,89237	8	6BREMO 230.0 kV - 6BREMODIST 230.0 kV Ckt 1	Description : Rebuild / Uprate 0.13 miles of 230kV Line # 202 between Bremo substation and Bremo Distribution. Time Estimate : 13-18 Months Cost : \$300,000	\$300,000
89228	6	6SEGE HILL 230.0 kV - AC1-221 TAP 230.0 kV Ckt 1	Description : No Violation. Applicable ITO Rating (94% Emerg for Single Cons) is 904 MVA. No Upgrade Required.	\$0
88816,88817,88818,89253	4	6BUCKING 230.0 kV - 6BREMO 230.0 kV Ckt 1	Description : Wreck & Rebuild 15.51 miles of 230kV Line # 298 between Bremo and Buckingham substations. A VA CPCN will be required Time Estimate : 44-48 Months Cost : \$38,780,000	\$38,780,000
88872	1	AD2-063 TAP 115.0 kV - 3CHASCTY 115.0 kV Ckt 1	Description : Wreck & Rebuild 6.2 miles of 115kV Line # 1012 between Chase City substation and Queue AD2-063. Note: line # 1012 is the Chase City to Pamplin line. Local approval will be required. Time Estimate : 30-36 Months Cost : \$12,400,000	\$12,400,000
89186	10	AC1-221 TAP 230.0 kV - 6PERSON230 T 230.0 kV Ckt 1	<u>Dominion</u> Description : No Violation. Applicable ITO Rating (94% Emerg for Single Cons) is 904 MVA. No Upgrade Required. <u>CPL</u> Description : The external (i.e. Non-PJM) Transmission Owner, Duke / CPL, will not evaluate this violation until the impact study phase.	\$0

89256,89257	2	6BREMIST 230.0 kV - 6MTEAGLE 230.0 kV Ckt 1	Description : Rebuild / Uprate 15 miles of 230kV Line # 2028 between Bremo Distribution and Mount Eagle substation. A VA CPCN will be required. Time Estimate : 36-44 Months Cost : \$37,500,000	\$37,500,000
89290,89291	9	6MTEAGLE 230.0 kV - 6CHARLVL 230.0 kV Ckt 1	Description : Rebuild / Uprate 6.5 miles of 230kV Line # 2028 between Charlottesville and Mount Eagle substations. A VA CPCN will be required. Time Estimate : 36-44 Months Cost : \$16,500,000	\$16,500,000
			TOTAL COST	\$145,730,000

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
88872	936480	AD2-063 TAP	DVP	314681	3CHASCTY	DVP	1	DVP_P4-4: 8442	breaker	239.0	77.0	102.1	DC	60.0

Bus #	Bus	MW Impact
925611	AC1-036 C	0.98
925612	AC1-036 E	9.3
935221	AD1-157 C	1.55
935222	AD1-157 E	6.0
935231	AD1-160 C	6.6
935232	AD1-160 E	9.1
936481	AD2-063 C O1	89.99
936482	AD2-063 E O1	60.0
936651	AD2-082 C	10.1
936652	AD2-082 E	4.9
938371	AE1-056 C	38.8
938372	AE1-056 E	21.2
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
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

Bus #	Bus	MW Impact
TRIMBLE	TRIMBLE	0.0
TVA	TVA	0.01
UNIONPOWER	UNIONPOWER	0.01

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
89256	313867	6BREMODIST	DVP	314765	6MTEAGLE	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	112.03	113.61	DC	10.48

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.61
315150	1BUGGS 1	7.34
315151	1BUGGS 2	7.34
315153	1CLOVER1	7.46
315154	1CLOVER2	7.36
315159	1KERR 2	0.86
315164	1KERR 7	0.85
315170	1BREMO 3	30.26
315171	1BREMO 4	66.49
315191	1BEARGRDN G1	15.31
315192	1BEARGRDN G2	15.31
315193	1BEARGRDN S1	31.5
920291	AA2-127	3.18
924021	AB2-043 C O1	0.44
924031	AB2-045 C	1.08
924161	AB2-060 C O1	1.29
924301	AB2-077 C O1	0.27
924311	AB2-078 C O1	0.27
924321	AB2-079 C O1	0.27
925611	AC1-036 C	0.19
925831	AC1-062	0.08
926271	AC1-105 C O1	3.21
926761	AC1-162 C	48.07
932511	AC2-071 C	1.07
933501	AC2-165 C	32.69
934621	AD1-088 C	14.6
935221	AD1-157 C	0.42
935231	AD1-160 C	1.78
936261	AD2-033 C	14.43
936361	AD2-046 C O1	5.51
936481	AD2-063 C O1	14.25
936651	AD2-082 C	2.73
938071	AE1-009 C O1	5.58
938371	AE1-056 C	10.48
938541	AE1-073 C	17.5
AA2-074	AA2-074	1.48
CARR	CARR	0.28
CBM-S1	CBM-S1	2.87
CBM-S2	CBM-S2	4.1
CBM-W1	CBM-W1	1.77

Bus #	Bus	MW Impact
CBM-W2	CBM-W2	17.71
CIN	CIN	0.88
CPL	CPL	2.18
IPL	IPL	0.53
LGEE	LGEE	0.26
MEC	MEC	2.3
MECS	MECS	0.29
RENSSELAER	RENSSELAER	0.22
WEC	WEC	0.23

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
89018	314562	3CLUBHSE	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-3: 6CAROLNA-TX#4	single	182.64	106.93	107.72	DC	3.2

Bus #	Bus	MW Impact
314704	3LAWRENC	0.99
315126	1ROARAP2	1.82
315128	1ROARAP4	1.75
315150	1BUGGS 1	8.35
315151	1BUGGS 2	8.35
315158	1KERR 1	0.31
315159	1KERR 2	1.25
315160	1KERR 3	1.23
315161	1KERR 4	1.23
315162	1KERR 5	1.23
315163	1KERR 6	1.23
315164	1KERR 7	1.23
918491	AA1-063AC OP	1.25
919691	AA2-053 C	1.57
920041	AA2-088 C OP	0.66
920671	AA2-174 C	0.07
923911	AB2-031 C O1	5.87
923991	AB2-040 C O1	3.32
924021	AB2-043 C O1	0.5
924161	AB2-060 C O1	1.41
924301	AB2-077 C O1	0.31
924311	AB2-078 C O1	0.31
924321	AB2-079 C O1	0.31
924401	AB2-089 C	1.97
925171	AB2-174 C O1	20.42
925611	AC1-036 C	0.12
925781	AC1-054 C O1	6.94
926201	AC1-098 C	2.9
926211	AC1-099 C	0.97
927141	AC1-208 C	5.54
931231	AB1-173 C	1.02
931241	AB1-173AC	1.02
932631	AC2-084 C	4.13
934201	AD1-047 C	21.01
934231	AD1-050 C	4.34
935231	AD1-160 C	0.54
936261	AD2-033 C	9.84
936361	AD2-046 C O1	7.63
936481	AD2-063 C O1	12.59
936651	AD2-082 C	0.83

Bus #	Bus	MW Impact
936711	AD2-090 C O1	3.45
937571	AD2-169 C	23.09
938371	AE1-056 C	3.2
CARR	CARR	0.05
CBM-S1	CBM-S1	0.89
CBM-S2	CBM-S2	0.89
CBM-W1	CBM-W1	0.97
CBM-W2	CBM-W2	5.87
CIN	CIN	0.45
CPLE	CPLE	0.43
IPL	IPL	0.28
LGEE	LGEE	0.13
MEC	MEC	0.94
MECS	MECS	0.43
RENSSELAER	RENSSELAER	0.04
WEC	WEC	0.12

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
89253	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P1-2: LN 556	single	571.52	113.18	116.11	DC	16.74

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.98
315150	1BUGGS 1	13.25
315151	1BUGGS 2	13.25
315153	1CLOVER1	22.47
315154	1CLOVER2	22.17
315159	1KERR 2	1.46
315162	1KERR 5	1.44
315163	1KERR 6	1.44
315164	1KERR 7	1.44
315266	1PLYWOOD A	1.5
924021	AB2-043 C O1	0.74
924031	AB2-045 C	1.62
924161	AB2-060 C O1	2.19
924301	AB2-077 C O1	0.46
924311	AB2-078 C O1	0.46
924321	AB2-079 C O1	0.46
924401	AB2-089 C	1.91
925611	AC1-036 C	0.32
925781	AC1-054 C O1	6.06
925831	AC1-062	0.13
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	1.6
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	0.67
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
AA2-074	AA2-074	2.33
CARR	CARR	0.24
CBM-S1	CBM-S1	5.29
CBM-S2	CBM-S2	6.52
CBM-W1	CBM-W1	4.92
CBM-W2	CBM-W2	34.31
CIN	CIN	2.25
CPL	CPL	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 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
89277	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P1-2: LN 556	single	559.3	112.17	115.16	DC	16.74

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.98
315150	1BUGGS 1	13.26
315151	1BUGGS 2	13.26
315153	1CLOVER1	22.48
315154	1CLOVER2	22.18
315159	1KERR 2	1.46
315162	1KERR 5	1.44
315163	1KERR 6	1.44
315164	1KERR 7	1.44
315266	1PLYWOOD A	1.5
924021	AB2-043 C O1	0.74
924161	AB2-060 C O1	2.19
924301	AB2-077 C O1	0.46
924311	AB2-078 C O1	0.46
924321	AB2-079 C O1	0.46
924401	AB2-089 C	1.92
925611	AC1-036 C	0.32
925781	AC1-054 C O1	6.07
925831	AC1-062	0.13
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	0.67
935231	AD1-160 C	2.85
936261	AD2-033 C	23.76
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
AA2-074	AA2-074	2.34
CARR	CARR	0.24
CBM-S1	CBM-S1	5.34
CBM-S2	CBM-S2	6.54
CBM-W1	CBM-W1	5.0
CBM-W2	CBM-W2	34.66
CIN	CIN	2.28
CPLE	CPLE	3.44
IPL	IPL	1.43
LGEE	LGEE	0.66
MEC	MEC	5.19
MECS	MECS	1.98
RENSSELAER	RENSSELAER	0.19
WEC	WEC	0.61

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
89228	314697	65EDGE HILL	DVP	927250	AC1-221 TAP	DVP	1	DVP_P1-2: LN 556	single	674.92	105.95	107.3	DC	9.13

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.56
315150	1BUGGS 1	17.21
315151	1BUGGS 2	17.21
315153	1CLOVER1	39.38
315154	1CLOVER2	38.86
315159	1KERR 2	1.28
315162	1KERR 5	1.26
315163	1KERR 6	1.26
315164	1KERR 7	1.26
315165	1HURT 1	5.16
315166	1HURT 2	5.16
315266	1PLYWOOD A	3.33
924021	AB2-043 C O1	0.73
924031	AB2-045 C	0.42
924161	AB2-060 C O1	2.1
924301	AB2-077 C O1	0.47
924311	AB2-078 C O1	0.47
924321	AB2-079 C O1	0.47
924401	AB2-089 C	1.61
925611	AC1-036 C	0.23
925661	AC1-042 C	1.6
925781	AC1-054 C O1	4.98
925831	AC1-062	0.08
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	56.68
927261	AC1-222 C	10.12
932511	AC2-071 C	0.42
932821	AC2-107 C	21.21
934231	AD1-050 C	3.56
934311	AD1-055 C	7.03
934611	AD1-087 C O1	26.94
934621	AD1-088 C	31.82
935171	AD1-152 C O1	26.77
935221	AD1-157 C	0.36
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	20.35
936651	AD2-082 C	2.38
937481	AD2-202 C O1	7.42
938371	AE1-056 C	9.13
AC1-133	AC1-133	20.67
BAYOU	BAYOU	2.61
BIG_CAJUN1	BIG_CAJUN1	4.13
BIG_CAJUN2	BIG_CAJUN2	8.32
BLUEG	BLUEG	6.67
CALDERWOOD	CALDERWOOD	1.58
CANNELTON	CANNELTON	0.47
CATAWBA	CATAWBA	1.69
CBM-N	CBM-N	0.04
CHEOAH	CHEOAH	1.48
CHILHOWEE	CHILHOWEE	0.51
CHOCTAW	CHOCTAW	2.82
COFFEEN	COFFEEN	0.81
COTTONWOOD	COTTONWOOD	10.2
DEARBORN	DEARBORN	0.82
DUCKCREEK	DUCKCREEK	1.64
EDWARDS	EDWARDS	0.73
ELMERSMITH	ELMERSMITH	0.84
FARMERCITY	FARMERCITY	0.6
G-007A	G-007A	0.34
GIBSON	GIBSON	0.29
HAMLET	HAMLET	6.37
NEWTON	NEWTON	2.1
NYISO	NYISO	0.16
O-066A	O-066A	0.15
PRAIRIE	PRAIRIE	4.51
SANTEETLA	SANTEETLA	0.44
SMITHLAND	SMITHLAND	0.41
TATANKA	TATANKA	1.0
TILTON	TILTON	0.85
TRIMBLE	TRIMBLE	0.73
TVA	TVA	4.3
UNIONPOWER	UNIONPOWER	2.21
VFT	VFT	0.88

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
89579	314702	3KERR	DVP	304102	3GW KING TAP	CPLE	1	DVP_P7-1: LN 22-90-A	tower	199.0	132.6	134.06	DC	6.41

Bus #	Bus	MW Impact
315150	1BUGGS 1	15.55
315151	1BUGGS 2	15.55
315158	1KERR 1	0.78
315159	1KERR 2	3.2
315160	1KERR 3	3.15
315161	1KERR 4	3.15
315162	1KERR 5	3.15
315163	1KERR 6	3.15
315164	1KERR 7	3.15
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	16.08
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
BAYOU	BAYOU	0.7
BIG_CAJUN1	BIG_CAJUN1	1.11
BIG_CAJUN2	BIG_CAJUN2	2.23
BLUEG	BLUEG	1.96

Bus #	Bus	MW Impact
CALDERWOOD	CALDERWOOD	0.42
CANNELTON	CANNELTON	0.13
CATAWBA	CATAWBA	0.42
CBM-N	CBM-N	0.01
CHEOAH	CHEOAH	0.39
CHILHOWEE	CHILHOWEE	0.14
CHOCTAW	CHOCTAW	0.76
COFFEEN	COFFEEN	0.23
COTTONWOOD	COTTONWOOD	2.75
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	1.63
NEWTON	NEWTON	0.6
NYISO	NYISO	0.03
O-066A	O-066A	0.04
PRAIRIE	PRAIRIE	1.27
SANTEETLA	SANTEETLA	0.12
SMITHLAND	SMITHLAND	0.11
TATANKA	TATANKA	0.28
TILTON	TILTON	0.25
TRIMBLE	TRIMBLE	0.22
TVA	TVA	1.16
UNIONPOWER	UNIONPOWER	0.58
VFT	VFT	0.24

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
89236	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	114.35	115.94	DC	10.48

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.61
315150	1BUGGS 1	7.34
315151	1BUGGS 2	7.34
315153	1CLOVER1	7.46
315154	1CLOVER2	7.36
315159	1KERR 2	0.86
315164	1KERR 7	0.85
315170	1BREMO 3	30.26
315171	1BREMO 4	66.49
315191	1BEARGRDN G1	15.31
315192	1BEARGRDN G2	15.31
315193	1BEARGRDN S1	31.5
920291	AA2-127	3.18
924021	AB2-043 C O1	0.44
924031	AB2-045 C	1.08
924161	AB2-060 C O1	1.29
924301	AB2-077 C O1	0.27
924311	AB2-078 C O1	0.27
924321	AB2-079 C O1	0.27
925611	AC1-036 C	0.19
925831	AC1-062	0.08
926271	AC1-105 C O1	3.21
926761	AC1-162 C	48.07
932511	AC2-071 C	1.07
933501	AC2-165 C	32.69
934621	AD1-088 C	14.6
935221	AD1-157 C	0.42
935231	AD1-160 C	1.78
936261	AD2-033 C	14.43
936361	AD2-046 C O1	5.51
936481	AD2-063 C O1	14.25
936651	AD2-082 C	2.73
938071	AE1-009 C O1	5.58
938371	AE1-056 C	10.48
938541	AE1-073 C	17.5
AA2-074	AA2-074	1.48
CARR	CARR	0.28
CBM-S1	CBM-S1	2.87
CBM-S2	CBM-S2	4.1
CBM-W1	CBM-W1	1.77

Bus #	Bus	MW Impact
CBM-W2	CBM-W2	17.71
CIN	CIN	0.88
CPL	CPL	2.18
IPL	IPL	0.53
LGEE	LGEE	0.26
MEC	MEC	2.3
MECS	MECS	0.29
RENSSELAER	RENSSELAER	0.22
WEC	WEC	0.23

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
89290	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	DVP_P1-2: LN 2027-B	single	661.76	108.29	109.87	DC	10.47

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.61
315150	1BUGGS 1	7.34
315151	1BUGGS 2	7.34
315153	1CLOVER1	7.46
315154	1CLOVER2	7.36
315159	1KERR 2	0.86
315164	1KERR 7	0.85
315170	1BREMO 3	30.26
315171	1BREMO 4	66.49
315191	1BEARGRDN G1	15.31
315192	1BEARGRDN G2	15.31
315193	1BEARGRDN S1	31.5
920291	AA2-127	3.18
924021	AB2-043 C O1	0.44
924031	AB2-045 C	1.08
924161	AB2-060 C O1	1.29
924301	AB2-077 C O1	0.27
924311	AB2-078 C O1	0.27
924321	AB2-079 C O1	0.27
925611	AC1-036 C	0.19
925831	AC1-062	0.08
926451	AC1-116 C	0.63
926761	AC1-162 C	48.06
932511	AC2-071 C	1.07
933501	AC2-165 C	32.69
934621	AD1-088 C	14.6
935221	AD1-157 C	0.42
935231	AD1-160 C	1.78
936261	AD2-033 C	14.43
936361	AD2-046 C O1	5.51
936481	AD2-063 C O1	14.25
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
AA2-074	AA2-074	1.48
CARR	CARR	0.28
CBM-S1	CBM-S1	2.86
CBM-S2	CBM-S2	4.1
CBM-W1	CBM-W1	1.75

Bus #	Bus	MW Impact
CBM-W2	CBM-W2	17.64
CIN	CIN	0.87
CPL	CPL	2.17
IPL	IPL	0.53
LGEE	LGEE	0.26
MEC	MEC	2.28
MECS	MECS	0.28
RENSSELAER	RENSSELAER	0.22
WEC	WEC	0.23

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
89186	927250	AC1-221 TAP	DVP	304070	6PERSON230 T	CPL	1	DVP_P1-2: LN 556	single	718.0	109.39	110.66	DC	9.13

Bus #	Bus	MW Impact
314429	3JTRSVLE	0.56
315150	1BUGGS 1	17.21
315151	1BUGGS 2	17.21
315153	1CLOVER1	39.38
315154	1CLOVER2	38.86
315159	1KERR 2	1.28
315162	1KERR 5	1.26
315163	1KERR 6	1.26
315164	1KERR 7	1.26
315165	1HURT 1	5.16
315166	1HURT 2	5.16
315266	1PLYWOOD A	3.33
924021	AB2-043 C O1	0.73
924031	AB2-045 C	0.42
924161	AB2-060 C O1	2.1
924301	AB2-077 C O1	0.47
924311	AB2-078 C O1	0.47
924321	AB2-079 C O1	0.47
924401	AB2-089 C	1.61
925611	AC1-036 C	0.23
925831	AC1-062	0.08
925991	AC1-075 C	11.93
926021	AC1-080 C	3.99
926271	AC1-105 C O1	14.49
926761	AC1-162 C	56.68
927251	AC1-221 C	11.73
927261	AC1-222 C	10.12
932511	AC2-071 C	0.42
932761	AC2-100 C	26.99
932821	AC2-107 C	21.21
934231	AD1-050 C	3.56
934311	AD1-055 C	7.03
934341	AD1-058 C	29.4
934611	AD1-087 C O1	26.94
934621	AD1-088 C	31.82
934991	AD1-131 C	9.64
935171	AD1-152 C O1	26.77
935221	AD1-157 C	0.36
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	20.35
936651	AD2-082 C	2.38
937481	AD2-202 C O1	7.42
938371	AE1-056 C	9.13
AC1-133	AC1-133	20.67
BAYOU	BAYOU	2.61
BIG_CAJUN1	BIG_CAJUN1	4.13
BIG_CAJUN2	BIG_CAJUN2	8.32
BLUEG	BLUEG	6.67
CALDERWOOD	CALDERWOOD	1.58
CANNELTON	CANNELTON	0.47
CATAWBA	CATAWBA	1.69
CBM-N	CBM-N	0.04
CHEOAH	CHEOAH	1.48
CHILHOWEE	CHILHOWEE	0.51
CHOCTAW	CHOCTAW	2.82
COFFEEN	COFFEEN	0.81
COTTONWOOD	COTTONWOOD	10.2
DEARBORN	DEARBORN	0.82
DUCKCREEK	DUCKCREEK	1.64
EDWARDS	EDWARDS	0.73
ELMERSMITH	ELMERSMITH	0.84
FARMERCITY	FARMERCITY	0.6
G-007A	G-007A	0.34
GIBSON	GIBSON	0.29
HAMLET	HAMLET	6.37
NEWTON	NEWTON	2.1
NYISO	NYISO	0.16
O-066A	O-066A	0.15
PRAIRIE	PRAIRIE	4.51
SANTEETLA	SANTEETLA	0.44
SMITHLAND	SMITHLAND	0.41
TATANKA	TATANKA	1.0
TILTON	TILTON	0.85
TRIMBLE	TRIMBLE	0.73
TVA	TVA	4.3
UNIONPOWER	UNIONPOWER	2.21
VFT	VFT	0.88

Contingency Name	Contingency Definition
DVP_P4-6: CAROLIN T122	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_P4-4: 8442	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 556	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_P4-2: 511T556	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_P4-2: 556T591	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_P7-1: LN 22-90-B	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_P7-1: LN 22-90-A	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 2027-A	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 2027-B	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_P4-2: 2202	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_P1-3: 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_P4-2: 511T591	CONTINGENCY 'DVP_P1-3: 6CAROLNA-TX#4' OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 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