



**Generation Interconnection  
Feasibility Study Report  
for  
Queue Project AF2-397  
FORK UNION-MT. EAGLE 230 KV  
78 MW Capacity / 130 MW Energy**

July 2020

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## 1 Introduction

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

## 2 Preface

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

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

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

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

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

## 3 General

The Interconnection Customer (IC), has proposed a solar/storage generating facility located in Fluvanna County, Virginia. The installed facilities will have a total capability of 130 MW with 78 MW of this output being recognized

by PJM as Capacity. The proposed in-service date for this project is December 15, 2023. This study does not imply a TO commitment to this in-service date.

<b>Queue Number</b>	<b>AF2-397</b>
<b>Project Name</b>	<b>FORK UNION-MT. EAGLE 230 KV</b>
<b>State</b>	Virginia
<b>County</b>	Fluvanna
<b>Transmission Owner</b>	Dominion
<b>MFO</b>	130
<b>MWE</b>	130
<b>MWC</b>	78
<b>Fuel</b>	Solar; Storage
<b>Basecase Study Year</b>	2023

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

#### 4 Point of Interconnection

AF2-397 will interconnect with the Dominion transmission system. The primary POI is a single line tap between Fork Union and Mt. Eagle 230 kV substation. The IC is responsible for securing right-of-way, permits and constructing the proposed attachment line from the storage facility site to the proposed new substation. Attachment 1 shows a one-line diagram of the proposed interconnection facilities. The IC may not install any facilities on Dominion’s right-of-way without first obtaining the necessary approval from Dominion Energy.

The IC requested that a secondary POI of a single line tap between Bremo 115 kV substation and Cunningham 115 kV substation be reviewed for network impacts. This report does not provide costs for the physical interconnection of the secondary point of interconnection. It was just analyzed for network impacts. Results are shown in the ‘Summer Peak – Load Flow Analysis – Secondary Point of Interconnection’ section of this report.

#### 5 Cost Summary

The AF2-397 project will be responsible for the following costs:

<b>Description</b>	<b>Total Cost</b>
Total Physical Interconnection Costs	\$ 10,400,000
Total System Network Upgrade Costs	\$ 76,730,000
<b>Total Costs</b>	<b>\$ 87,130,000</b>

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129. If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

## **6 Transmission Owner Scope of Work**

Dominion assessed the impact of the proposed Queue Project AF2-397 was evaluated as a 78 MW Capacity (130.0 MW Energy) injection at a single line tap between Fork Union 230 kV substation and Mt. Eagle 230 kV in the Dominion Transmission System, for compliance with NERC Reliability Criteria on Dominion Transmission System. The system was assessed using the summer 2023 AF2 case provided to Dominion by PJM. When performing a generation analysis, Dominion's main analysis will be load flow study results under single contingency (both normal and stressed system conditions). Dominion Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. A full listing of Dominion's Planning Criteria and interconnection requirements can be found in the Company's Facility Connection Requirements which are publicly available at: <http://www.dominionenergy.com>.

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

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of the AF2-397 generation project to the Dominion Transmission System is detailed in the following sections. The associated one-line with the generation project attachment facilities and primary direct and non-direct connection are shown in Attachment 1.

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

The total physical interconnection costs is given in the table below:

Description	Total Cost
Attachment Facilities	\$ 2,100,000
New three breaker ring-bus	\$ 6,500,000
Re-arrange transmission line to cut-in new substation	\$ 1,800,000
<b>Total Physical Interconnection Costs</b>	<b>\$ 10,400,000</b>

## 7 Schedule

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

## 8 Transmission Owner Analysis

### 8.1 Power Flow Analysis

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

## 9 Interconnection Customer Requirements

### 9.1 System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in Dominion’s “Dominion Energy Electric Transmission Generator Interconnection Requirements” documented in Dominion’s Facility Interconnection Requirements “Exhibit C” located at:

<https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>. Preliminary Protection requirements will be provided as part of the Facilities Study. Detailed Protection Requirements will be provided once the project enters the construction phase.

### 9.2 Compliance Issues and Interconnection Customer Requirements

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

1. The purchase and installation of a fully rated protection device (circuit breaker, circuit switcher, fuse) to protect the IC’s GSU transformer(s).

2. The purchase and installation of the minimum required Dominion generation interconnection relaying and control facilities as described in the System Protection noted above. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.
3. The purchase and installation of supervisory control and data acquisition (“SCADA”) equipment to provide information in a compatible format to the Dominion Transmission System Control Center.
4. Compliance with the Dominion and PJM generator power factor and voltage control requirements.

The GSU(s) associated with the IC queue request shall meet the grounding requirements as noted in Dominion’s “Dominion’s Facility Interconnection Requirements” document located at:

<https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>.

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

### **1.1 Power Factor Requirements**

The IC shall design its non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading (absorbing VARs) to 0.95 lagging (supplying VARs) measured at the high-side of the facility substation transformer(s) connected to the Dominion transmission system.

## **10 Revenue Metering and SCADA Requirements**

### **10.1 PJM Requirements**

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Section 8 of Attachment O.

#### **10.1.1 Meteorological Data Reporting Requirements**

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

- Back Panel temperature (Fahrenheit)
- Irradiance (Watts/meter<sup>2</sup>)
- Ambient air temperature (Fahrenheit) – (Accepted, not required)
- Wind speed (meters/second) – (Accepted, not required)
- Wind direction (decimal degrees from true north) – (Accepted, not required)

## 10.2 Interconnected Transmission Owner Requirements

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

## 11 Summer Peak - Load Flow Analysis - Primary POI

The Queue Project AF2-397 was evaluated as a 130.0 MW (Capacity 78.0 MW) injection tapping the Fork Union to Mt. Eagle 230 kV line in the Dominion area. Project AF2-397 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-397 was studied with a commercial probability of 53%. Potential network impacts were as follows:

### 11.1 Generation Deliverability

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

None

### 11.2 Multiple Facility Contingency

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

None

### 11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
9783876 1	31467 7	6BUCKIN G	230. 0	DVP	31474 7	6BREMO	230. 0	DVP	1	DVP_P4- 2: 511T591	break er	699.0	138.96	139.48	DC	7.72
9783876 2	31467 7	6BUCKIN G	230. 0	DVP	31474 7	6BREMO	230. 0	DVP	1	DVP_P4- 2: 556T591	break er	699.0	139.05	139.57	DC	7.72
1061329 68	31467 7	6BUCKIN G	230. 0	DVP	31474 7	6BREMO	230. 0	DVP	1	DVP_P4- 2: 511T556- A	break er	699.0	139.05	139.57	DC	7.72
9783877 6	31469 2	6FARMVI L	230. 0	DVP	31467 7	6BUCKIN G	230. 0	DVP	1	DVP_P4- 2: 511T591	break er	684.0	137.94	138.47	DC	7.71
9783877 8	31469 2	6FARMVI L	230. 0	DVP	31467 7	6BUCKIN G	230. 0	DVP	1	DVP_P4- 2: 556T591	break er	684.0	138.02	138.55	DC	7.71
1061329 73	31469 2	6FARMVI L	230. 0	DVP	31467 7	6BUCKIN G	230. 0	DVP	1	DVP_P4- 2: 511T556- A	break er	684.0	138.03	138.56	DC	7.71
9816188 2	31476 5	6MTEAG LE	230. 0	DVP	31474 9	6CHARLV L	230. 0	DVP	1	DVP_P1- 2: LN 2027-B	single	661.7600097 66	119.83	127.35	DC	49.82
9816188 3	31476 5	6MTEAG LE	230. 0	DVP	31474 9	6CHARLV L	230. 0	DVP	1	314333 6POWHA TN 230 933500 AC2-165 TAP 230 1	single	661.7600097 66	119.78	127.31	DC	49.82
9816183 6	96106 0	AF2-397 TAP	230. 0	DVP	31476 5	6MTEAG LE	230. 0	DVP	1	DVP_P1- 2: LN 2027-B	single	661.7600097 66	122.95	130.48	DC	49.82
9816183 7	96106 0	AF2-397 TAP	230. 0	DVP	31476 5	6MTEAG LE	230. 0	DVP	1	314333 6POWHA TN 230 933500 AC2-165 TAP 230 1	single	661.7600097 66	122.9	130.43	DC	49.82

### 11.4 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed

with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
98161903	313707	6FORK UNION	230.0	DVP	961060	AF2-397 TAP	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	143.1	145.98	DC	19.02
98161945	313867	6BREMODI ST	230.0	DVP	313707	6FORK UNION	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	140.18	142.55	DC	15.59
98162183	313868	6CARTERV	230.0	DVP	933500	AC2-165 TAP	230.0	DVP	1	DVP_P 1-2: LN 2028-A	operati on	800.880004883	100.96	108.68	DC	61.85
98162150	314310	6JUDES F	230.0	DVP	314322	6MDLTHA N	230.0	DVP	1	DVP_P 1-2: LN 2028-A	operati on	800.880004883	108.69	116.41	DC	61.84
98162114	314333	6POWHAT N	230.0	DVP	314310	6JUDES F	230.0	DVP	1	DVP_P 1-2: LN 2028-A	operati on	800.880004883	112.5	120.22	DC	61.84
106558045	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	571.520019531	167.06	167.7	DC	7.71
106558302	314686	6CLOVER	230.0	DVP	934610	AD1-087 TAP	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	814.979980469	139.01	139.7	DC	12.49
106558056	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	559.299987793	165.73	166.38	DC	7.7
98161925	314747	6BREMO	230.0	DVP	313867	6BREMODI ST	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	142.55	144.92	DC	15.59
98162181	314747	6BREMO	230.0	DVP	313868	6CARTERV	230.0	DVP	1	DVP_P 1-2: LN 2028-A	operati on	800.880004883	101.72	109.44	DC	61.85
98161878	314765	6MTEAGLE	230.0	DVP	314749	6CHARLV L	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	137.53	150.08	DC	83.03
98161888	314765	6MTEAGLE	230.0	DVP	314749	6CHARLV L	230.0	DVP	1	Base Case	operati on	661.760009766	92.58	102.58	DC	66.0
98162144	933500	AC2-165 TAP	230.0	DVP	314333	6POWHAT N	230.0	DVP	1	DVP_P 1-2: LN 2028-A	operati on	800.880004883	108.71	116.43	DC	61.85
106558182	934610	AD1-087 TAP	230.0	DVP	314697	6SEGE HILL	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	814.979980469	150.67	151.36	DC	12.49
97581166	941010	AE2-092 TAP	115.0	DVP	314774	3SHERWO D	115.0	DVP	1	DVP_P 1-2: LN 2028-A	operati on	169.199996948	117.1	125.08	DC	13.48
98161832	961060	AF2-397 TAP	230.0	DVP	314765	6MTEAGLE	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	141.7	154.25	DC	83.03
98161842	961060	AF2-397 TAP	230.0	DVP	314765	6MTEAGLE	230.0	DVP	1	Base Case	operati on	661.760009766	95.48	105.48	DC	66.0

## 11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
98161836,98161837	4	AF2-397 TAP 230.0 kV - 6MTEAGLE 230.0 kV Ckt 1	<u>DVP</u> dom-245 (1367) : Rebuild 12.1 miles of 230 kV Line 2028 from Mount Eagle to AF2-397 Tap with 2-636 ACSR. Project Type : FAC Cost : \$18,150,000 Time Estimate : 30-36 Months	\$18,150,000
98161883,98161882	3	6MTEAGLE 230.0 kV - 6CHARLVL 230.0 kV Ckt 1	<u>DVP</u> dom-073 (1162) : Rebuild 6.47 miles of 230 kV Line 2028 from Mt Eagle to Charlottesville with 2-636 ACSR. Project Type : FAC Cost : \$16,175,000 Time Estimate : 30-36 Months	\$16,175,000
106132973,97838776,97838778	2	6FARMVIL 230.0 kV - 6BUCKING 230.0 kV Ckt 1	<u>DVP</u> dom-035 (1124) : Rebuild 12.76 miles of 230 kV Line 298 from Buckingham to Farmville with 2-636 ACSR. Project Type : FAC Cost : \$19,140,000 Time Estimate : 30-36 Months	\$19,140,000
97838762,97838761,106132968	1	6BUCKING 230.0 kV - 6BREMO 230.0 kV Ckt 1	<u>DVP</u> dom-034 (1123) : Rebuild 15.51 miles of 230 kV Line 298 from Buckingham to Brema with 2-636 ACSR. Project Type : FAC Cost : \$23,265,000 Time Estimate : 30-36 Months	\$23,265,000
			<b>TOTAL COST</b>	<b>\$76,730,000</b>

## 11.6 Flow Gate Details - Primary POI

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

### 11.6.1 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
106132968	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 511T556-A	breaker	699.0	139.05	139.57	DC	7.72

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.2225	50/50	0.2225
314429	3JTRSVLE	0.8900	50/50	0.8900
314677	6BUCKING	1.6254	50/50	1.6254
315153	1CLOVER1	22.4660	50/50	22.4660
315154	1CLOVER2	22.2421	50/50	22.2421
924022	AB2-043 E O1	3.2830	Adder	3.86
924032	AB2-045 E	4.3975	50/50	4.3975
924162	AB2-060 E OP	5.0960	Adder	6.0
924301	AB2-077 C O1 (Suspended)	2.2889	Adder	2.69
924302	AB2-077 E O1 (Suspended)	1.5259	Adder	1.8
924311	AB2-078 C O1 (Suspended)	2.2889	Adder	2.69
924312	AB2-078 E O1 (Suspended)	1.5259	Adder	1.8
924321	AB2-079 C O1 (Suspended)	2.2889	Adder	2.69
924322	AB2-079 E O1 (Suspended)	1.5259	Adder	1.8
925611	AC1-036 C	1.8363	50/50	1.8363
925612	AC1-036 E	2.9961	50/50	2.9961
925781	AC1-054 C O1	5.1714	Adder	6.08
925782	AC1-054 E O1	2.3823	Adder	2.8
925831	AC1-062	0.1321	50/50	0.1321
925991	AC1-075 C	4.2224	Adder	4.97
925992	AC1-075 E	2.3923	Adder	2.81
926021	AC1-080 C	1.4111	Adder	1.66
926022	AC1-080 E	0.7938	Adder	0.93
926271	AC1-105 C O1 (Suspended)	5.7567	Adder	6.77
926272	AC1-105 E O1 (Suspended)	2.8657	Adder	3.37
926451	AC1-116 C	-0.3880	Adder	-0.46
927251	AC1-221 C	1.4229	Adder	1.67
927252	AC1-221 E	1.4229	Adder	1.67
927261	AC1-222 C	3.4591	Adder	4.07
927262	AC1-222 E	3.2930	Adder	3.87
932511	AC2-071 C	9.2835	50/50	9.2835
932512	AC2-071 E	4.6767	50/50	4.6767

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
932761	AC2-100 C	3.2747	Adder	3.85
932762	AC2-100 E	1.5984	Adder	1.88
934311	AD1-055 C	2.4018	Adder	2.83
934312	AD1-055 E	0.6193	Adder	0.73
934341	AD1-058 C	3.5671	Adder	4.2
934342	AD1-058 E	0.9064	Adder	1.07
934611	AD1-087 C O1	10.2490	Adder	12.06
934612	AD1-087 E O1	4.8168	Adder	5.67
934621	AD1-088 C	35.2759	50/50	35.2759
934622	AD1-088 E	16.6004	50/50	16.6004
934991	AD1-131 C	1.1695	Adder	1.38
934992	AD1-131 E	0.7797	Adder	0.92
935171	AD1-152 C O1	10.1853	Adder	11.98
935172	AD1-152 E O1	6.7902	Adder	7.99
935221	AD1-157 C	3.8759	50/50	3.8759
935222	AD1-157 E	2.5840	50/50	2.5840
936261	AD2-033 C	23.8079	50/50	23.8079
936262	AD2-033 E	15.8720	50/50	15.8720
936361	AD2-046 C O1	7.9875	Adder	9.4
936362	AD2-046 E O1	3.6731	Adder	4.32
936481	AD2-063 C O1	20.2427	Adder	23.81
936482	AD2-063 E O1	13.3827	Adder	15.74
937481	AD2-202 C O1	2.7161	Adder	3.2
937482	AD2-202 E O1	1.5278	Adder	1.8
938371	AE1-056 C	16.7096	50/50	16.7096
938372	AE1-056 E	9.1300	50/50	9.1300
939181	AE1-148 C O1	8.0045	Adder	9.42
939182	AE1-148 E O1	5.3363	Adder	6.28
940241	AE2-006	0.9343	50/50	0.9343
940661	AE2-053 O1	2.9646	Adder	3.49
941791	AE2-182 C	5.7311	50/50	5.7311
941792	AE2-182 E	2.6679	50/50	2.6679
942451	AE2-258	2.7391	Adder	3.22
942461	AE2-259 C O1	30.4818	50/50	30.4818
942462	AE2-259 E O1	20.3212	50/50	20.3212
942751	AE2-291 C O1	5.6712	Adder	6.67
942752	AE2-291 E O1	3.7808	Adder	4.45
942761	AE2-292 C O1	7.0612	Adder	8.31
942762	AE2-292 E O1	4.7075	Adder	5.54
943901	AF1-058 C	1.9498	Adder	2.29
943902	AF1-058 E	1.2999	Adder	1.53
943911	AF1-059	13.3220	Adder	15.67
945811	AF1-246 C O1	10.5311	Adder	12.39
945812	AF1-246 E O1	14.5430	Adder	17.11
946293	AF1-293 BAT	11.0414	Merchant Transmission	11.0414
946301	AF1-294 C	9.9165	50/50	9.9165
946302	AF1-294 E	6.6110	50/50	6.6110
957481	AF2-042 C O1	39.8679	Adder	88.5
957482	AF2-042 E O1	26.5786	Adder	59.0
958211	AF2-115 C	6.0467	50/50	6.0467
958212	AF2-115 E	4.0311	50/50	4.0311
958801	AF2-171 C O1	36.0558	50/50	36.0558

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958802	AF2-171 E O1	24.0372	50/50	24.0372
959311	AF2-222 C	33.3580	50/50	33.3580
959312	AF2-222 E	22.3499	50/50	22.3499
959751	AF2-266 O1	6.6449	Adder	14.75
960061	AF2-297 C O1	4.1336	Adder	9.18
960062	AF2-297 E O1	2.7558	Adder	6.12
960811	AF2-372 C	0.7663	Adder	1.7
960812	AF2-372 E	1.2505	Adder	2.78
960821	AF2-373 C	0.5309	Adder	1.18
960822	AF2-373 E	0.7963	Adder	1.77
961063	AF2-397 BAT	4.0902	Merchant Transmission	4.0902
961081	AF2-399 C	0.7802	50/50	0.7802
961082	AF2-399 E	1.3191	50/50	1.3191
WEC	WEC	0.2974	Confirmed LTF	0.2974
LGEE	LGEE	0.5619	Confirmed LTF	0.5619
CPL	CPL	3.4934	Confirmed LTF	3.4934
CBM-W2	CBM-W2	12.4079	Confirmed LTF	12.4079
NY	NY	0.3932	Confirmed LTF	0.3932
CBM-W1	CBM-W1	11.0588	Confirmed LTF	11.0588
TVA	TVA	2.6432	Confirmed LTF	2.6432
O-066	O-066	5.4835	Confirmed LTF	5.4835
CBM-S2	CBM-S2	23.4437	Confirmed LTF	23.4437
CBM-S1	CBM-S1	14.6544	Confirmed LTF	14.6544
G-007	G-007	0.8549	Confirmed LTF	0.8549
MADISON	MADISON	0.7822	Confirmed LTF	0.7822
MEC	MEC	1.8337	Confirmed LTF	1.8337
AA2-074	AA2-074	2.3805	LTF	2.3805

## 11.6.2 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
106132973	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2: 511T556-A	breaker	684.0	138.03	138.56	DC	7.71

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.2225	50/50	0.2225
314429	3JTRSVLE	0.8902	50/50	0.8902
315153	1CLOVER1	22.4721	50/50	22.4721
315154	1CLOVER2	22.2481	50/50	22.2481
924022	AB2-043 E O1	3.2840	Adder	3.86
924162	AB2-060 E OP	5.0975	Adder	6.0
924301	AB2-077 C O1 (Suspended)	2.2896	Adder	2.69
924302	AB2-077 E O1 (Suspended)	1.5264	Adder	1.8
924311	AB2-078 C O1 (Suspended)	2.2896	Adder	2.69
924312	AB2-078 E O1 (Suspended)	1.5264	Adder	1.8
924321	AB2-079 C O1 (Suspended)	2.2896	Adder	2.69
924322	AB2-079 E O1 (Suspended)	1.5264	Adder	1.8
925611	AC1-036 C	1.8367	50/50	1.8367
925612	AC1-036 E	2.9967	50/50	2.9967
925781	AC1-054 C O1	5.1741	Adder	6.09
925782	AC1-054 E O1	2.3836	Adder	2.8
925831	AC1-062	0.1321	50/50	0.1321
925991	AC1-075 C	4.2247	Adder	4.97
925992	AC1-075 E	2.3936	Adder	2.82
926021	AC1-080 C	1.4119	Adder	1.66
926022	AC1-080 E	0.7942	Adder	0.93
926271	AC1-105 C O1 (Suspended)	5.7587	Adder	6.77
926272	AC1-105 E O1 (Suspended)	2.8667	Adder	3.37
926451	AC1-116 C	-0.3877	Adder	-0.46
927251	AC1-221 C	1.4238	Adder	1.68
927252	AC1-221 E	1.4238	Adder	1.68
927261	AC1-222 C	3.4605	Adder	4.07
927262	AC1-222 E	3.2943	Adder	3.88
932761	AC2-100 C	3.2767	Adder	3.85
932762	AC2-100 E	1.5993	Adder	1.88
934311	AD1-055 C	2.4027	Adder	2.83
934312	AD1-055 E	0.6196	Adder	0.73
934341	AD1-058 C	3.5693	Adder	4.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934342	AD1-058 E	0.9069	Adder	1.07
934611	AD1-087 C O1	10.2518	Adder	12.06
934612	AD1-087 E O1	4.8182	Adder	5.67
934621	AD1-088 C	35.2809	50/50	35.2809
934622	AD1-088 E	16.6028	50/50	16.6028
934991	AD1-131 C	1.1702	Adder	1.38
934992	AD1-131 E	0.7802	Adder	0.92
935171	AD1-152 C O1	10.1882	Adder	11.99
935172	AD1-152 E O1	6.7921	Adder	7.99
935221	AD1-157 C	3.8766	50/50	3.8766
935222	AD1-157 E	2.5844	50/50	2.5844
936261	AD2-033 C	23.8134	50/50	23.8134
936262	AD2-033 E	15.8756	50/50	15.8756
936361	AD2-046 C O1	7.9908	Adder	9.4
936362	AD2-046 E O1	3.6746	Adder	4.32
936481	AD2-063 C O1	20.2480	Adder	23.82
936482	AD2-063 E O1	13.3862	Adder	15.75
937481	AD2-202 C O1	2.7168	Adder	3.2
937482	AD2-202 E O1	1.5282	Adder	1.8
938371	AE1-056 C	16.7123	50/50	16.7123
938372	AE1-056 E	9.1315	50/50	9.1315
938561	AE1-075 C	-0.9180	Adder	-1.08
939181	AE1-148 C O1	8.0077	Adder	9.42
939182	AE1-148 E O1	5.3385	Adder	6.28
940241	AE2-006	0.9345	50/50	0.9345
940661	AE2-053 O1	2.9658	Adder	3.49
941791	AE2-182 C	5.7319	50/50	5.7319
941792	AE2-182 E	2.6683	50/50	2.6683
942451	AE2-258	2.7399	Adder	3.22
942461	AE2-259 C O1	30.4860	50/50	30.4860
942462	AE2-259 E O1	20.3240	50/50	20.3240
942751	AE2-291 C O1	5.6749	Adder	6.68
942752	AE2-291 E O1	3.7832	Adder	4.45
942761	AE2-292 C O1	7.0658	Adder	8.31
942762	AE2-292 E O1	4.7105	Adder	5.54
943901	AF1-058 C	1.9505	Adder	2.29
943902	AF1-058 E	1.3004	Adder	1.53
943911	AF1-059	13.3280	Adder	15.68
945811	AF1-246 C O1	10.5336	Adder	12.39
945812	AF1-246 E O1	14.5465	Adder	17.11
946293	AF1-293 BAT	11.0357	Merchant Transmission	11.0357
946301	AF1-294 C	9.9182	50/50	9.9182
946302	AF1-294 E	6.6122	50/50	6.6122
957481	AF2-042 C O1	39.8774	Adder	88.52
957482	AF2-042 E O1	26.5849	Adder	59.01
958211	AF2-115 C	6.0477	50/50	6.0477
958212	AF2-115 E	4.0318	50/50	4.0318
958503	AF2-144 BAT	0.4731	Merchant Transmission	0.4731
958801	AF2-171 C O1	36.0621	50/50	36.0621
958802	AF2-171 E O1	24.0414	50/50	24.0414
959311	AF2-222 C	33.3650	50/50	33.3650
959312	AF2-222 E	22.3545	50/50	22.3545

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959751	AF2-266 O1	6.6467	Adder	14.75
960061	AF2-297 C O1	4.1352	Adder	9.18
960062	AF2-297 E O1	2.7568	Adder	6.12
960811	AF2-372 C	0.7665	Adder	1.7
960812	AF2-372 E	1.2509	Adder	2.78
960821	AF2-373 C	0.5310	Adder	1.18
960822	AF2-373 E	0.7965	Adder	1.77
961063	AF2-397 BAT	4.0883	Merchant Transmission	4.0883
961081	AF2-399 C	0.7803	50/50	0.7803
961082	AF2-399 E	1.3193	50/50	1.3193
WEC	WEC	0.2996	Confirmed LTF	0.2996
LGEE	LGEE	0.5659	Confirmed LTF	0.5659
CPL	CPL	3.4980	Confirmed LTF	3.4980
CBM-W2	CBM-W2	12.4652	Confirmed LTF	12.4652
NY	NY	0.3893	Confirmed LTF	0.3893
CBM-W1	CBM-W1	11.1464	Confirmed LTF	11.1464
TVA	TVA	2.6530	Confirmed LTF	2.6530
O-066	O-066	5.4365	Confirmed LTF	5.4365
CBM-S2	CBM-S2	23.4841	Confirmed LTF	23.4841
CBM-S1	CBM-S1	14.7140	Confirmed LTF	14.7140
G-007	G-007	0.8476	Confirmed LTF	0.8476
MADISON	MADISON	0.7822	Confirmed LTF	0.7822
MEC	MEC	1.8448	Confirmed LTF	1.8448
AA2-074	AA2-074	2.3836	LTF	2.3836

### 11.6.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
98161883	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	314333 6POWHATN 230 933500 AC2-165 TAP 230 1	single	661.76	119.78	127.31	DC	49.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1363	80/20	0.1363
314429	3JTRSVLE	0.5452	80/20	0.5452
314572	3EMPORIA	0.0219	80/20	0.0219
314677	6BUCKING	1.0694	80/20	1.0694
314704	3LAWRENC	0.1423	80/20	0.1423
315153	1CLOVER1	7.3430	80/20	7.3430
315154	1CLOVER2	7.2698	80/20	7.2698
315158	1KERR 1	0.2422	80/20	0.2422
315159	1KERR 2	0.6782	80/20	0.6782
315160	1KERR 3	0.6782	80/20	0.6782
315161	1KERR 4	0.6782	80/20	0.6782
315162	1KERR 5	0.6782	80/20	0.6782
315163	1KERR 6	0.6782	80/20	0.6782
315164	1KERR 7	0.6782	80/20	0.6782
315191	1BEARGRDN G1	15.0842	80/20	15.0842
315192	1BEARGRDN G2	15.0842	80/20	15.0842
315193	1BEARGRDN S1	31.0443	80/20	31.0443
315266	1PLYWOOD A	0.6953	80/20	0.6953
920291	AA2-127	3.1336	80/20	3.1336
924021	AB2-043 C O1	0.4312	80/20	0.4312
924161	AB2-060 C OP	1.2758	80/20	1.2758
924301	AB2-077 C O1 (Suspended)	1.5499	80/20	1.5499
924311	AB2-078 C O1 (Suspended)	1.5499	80/20	1.5499
924321	AB2-079 C O1 (Suspended)	1.5499	80/20	1.5499
925171	AB2-174 C O1	0.3622	80/20	0.3622
925611	AC1-036 C	1.1045	80/20	1.1045
925781	AC1-054 C O1	3.6512	80/20	3.6512
925831	AC1-062	0.0809	80/20	0.0809
925991	AC1-075 C	2.5684	80/20	2.5684
926021	AC1-080 C	0.8584	80/20	0.8584
926271	AC1-105 C O1 (Suspended)	3.1786	80/20	3.1786
926451	AC1-116 C	3.6384	80/20	3.6384
927251	AC1-221 C	0.7555	80/20	0.7555
927261	AC1-222 C	1.8244	80/20	1.8244
932511	AC2-071 C	6.1076	80/20	6.1076
932761	AC2-100 C	1.7388	80/20	1.7388

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
933501	AC2-165 C	32.1571	80/20	32.1571
934311	AD1-055 C	1.2668	80/20	1.2668
934341	AD1-058 C	1.8940	80/20	1.8940
934611	AD1-087 C O1	4.2050	80/20	4.2050
934621	AD1-088 C	19.9913	80/20	19.9913
934991	AD1-131 C	0.6210	80/20	0.6210
935171	AD1-152 C O1	4.1789	80/20	4.1789
935221	AD1-157 C	2.3854	80/20	2.3854
936261	AD2-033 C	14.2451	80/20	14.2451
936361	AD2-046 C O1	5.4614	80/20	5.4614
936481	AD2-063 C O1	14.0364	80/20	14.0364
937481	AD2-202 C O1	1.1144	80/20	1.1144
938371	AE1-056 C	10.2839	80/20	10.2839
938821	AE1-108 C	35.7983	80/20	35.7983
939181	AE1-148 C O1	5.4713	80/20	5.4713
940241	AE2-006	0.5619	80/20	0.5619
940661	AE2-053 O1	2.0264	80/20	2.0264
941011	AE2-092 C	29.1911	80/20	29.1911
941791	AE2-182 C	3.2479	80/20	3.2479
942451	AE2-258	1.8649	80/20	1.8649
942461	AE2-259 C O1	18.9528	80/20	18.9528
942751	AE2-291 C O1	3.7718	80/20	3.7718
942761	AE2-292 C O1	4.6962	80/20	4.6962
943901	AF1-058 C	0.9984	80/20	0.9984
943911	AF1-059	9.5960	80/20	9.5960
945811	AF1-246 C O1	3.2617	80/20	3.2617
946281	AF1-292 C	0.4551	80/20	0.4551
946291	AF1-293 C O1	47.0478	80/20	47.0478
946301	AF1-294 C	6.0747	80/20	6.0747
946591	AF1-323 C	11.4715	80/20	11.4715
957481	AF2-042 C O1	23.7450	80/20	23.7450
958131	AF2-107 C	6.0592	80/20	6.0592
958211	AF2-115 C	3.7041	80/20	3.7041
958801	AF2-171 C O1	22.0788	80/20	22.0788
959311	AF2-222 C	20.1270	80/20	20.1270
959751	AF2-266 O1	4.8210	80/20	4.8210
960061	AF2-297 C O1	3.9936	80/20	3.9936
960081	AF2-299 C	0.7671	80/20	0.7671
960111	AF2-302 C	4.1714	80/20	4.1714
960811	AF2-372 C	0.9790	80/20	0.9790
960821	AF2-373 C	0.5906	80/20	0.5906
961061	AF2-397 C O1	49.8186	80/20	49.8186
961081	AF2-399 C	0.4779	80/20	0.4779
WEC	WEC	0.1254	Confirmed LTF	0.1254
LGEE	LGEE	0.2482	Confirmed LTF	0.2482
CPL	CPL	2.1704	Confirmed LTF	2.1704
CBM-W2	CBM-W2	6.5766	Confirmed LTF	6.5766
NY	NY	0.4302	Confirmed LTF	0.4302
CBM-W1	CBM-W1	4.4035	Confirmed LTF	4.4035
TVA	TVA	1.4980	Confirmed LTF	1.4980
CBM-S2	CBM-S2	14.4558	Confirmed LTF	14.4558
CBM-S1	CBM-S1	8.1110	Confirmed LTF	8.1110

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>MADISON</b>	MADISON	0.5443	Confirmed LTF	0.5443
<b>MEC</b>	MEC	0.8692	Confirmed LTF	0.8692
<b>AA2-074</b>	AA2-074	1.4778	LTF	1.4778

#### 11.6.4 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
98161837	961060	AF2-397 TAP	DVP	314765	6MTEAGLE	DVP	1	314333 6POWHATN 230 933500 AC2-165 TAP 230 1	single	661.76	122.9	130.43	DC	49.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1363	80/20	0.1363
314429	3JTRSVLE	0.5452	80/20	0.5452
314572	3EMPORIA	0.0219	80/20	0.0219
314677	6BUCKING	1.0694	80/20	1.0694
314704	3LAWRENC	0.1423	80/20	0.1423
315153	1CLOVER1	7.3430	80/20	7.3430
315154	1CLOVER2	7.2698	80/20	7.2698
315158	1KERR 1	0.2422	80/20	0.2422
315159	1KERR 2	0.6782	80/20	0.6782
315160	1KERR 3	0.6782	80/20	0.6782
315161	1KERR 4	0.6782	80/20	0.6782
315162	1KERR 5	0.6782	80/20	0.6782
315163	1KERR 6	0.6782	80/20	0.6782
315164	1KERR 7	0.6782	80/20	0.6782
315191	1BEARGRDN G1	15.0842	80/20	15.0842
315192	1BEARGRDN G2	15.0842	80/20	15.0842
315193	1BEARGRDN S1	31.0443	80/20	31.0443
315266	1PLYWOOD A	0.6953	80/20	0.6953
920291	AA2-127	3.1336	80/20	3.1336
924021	AB2-043 C O1	0.4312	80/20	0.4312
924161	AB2-060 C OP	1.2758	80/20	1.2758
924301	AB2-077 C O1 (Suspended)	1.5499	80/20	1.5499
924311	AB2-078 C O1 (Suspended)	1.5499	80/20	1.5499
924321	AB2-079 C O1 (Suspended)	1.5499	80/20	1.5499
925171	AB2-174 C O1	0.3622	80/20	0.3622
925611	AC1-036 C	1.1045	80/20	1.1045
925781	AC1-054 C O1	3.6512	80/20	3.6512
925831	AC1-062	0.0809	80/20	0.0809
925991	AC1-075 C	2.5684	80/20	2.5684
926021	AC1-080 C	0.8584	80/20	0.8584
926271	AC1-105 C O1 (Suspended)	3.1786	80/20	3.1786
926451	AC1-116 C	-0.9024	Adder	-1.06
927251	AC1-221 C	0.7555	80/20	0.7555
927261	AC1-222 C	1.8244	80/20	1.8244
932511	AC2-071 C	6.1076	80/20	6.1076
932761	AC2-100 C	1.7388	80/20	1.7388

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
933501	AC2-165 C	32.1571	80/20	32.1571
934311	AD1-055 C	1.2668	80/20	1.2668
934341	AD1-058 C	1.8940	80/20	1.8940
934611	AD1-087 C O1	4.2050	80/20	4.2050
934621	AD1-088 C	19.9913	80/20	19.9913
934991	AD1-131 C	0.6210	80/20	0.6210
935171	AD1-152 C O1	4.1789	80/20	4.1789
935221	AD1-157 C	2.3854	80/20	2.3854
936261	AD2-033 C	14.2451	80/20	14.2451
936361	AD2-046 C O1	5.4614	80/20	5.4614
936481	AD2-063 C O1	14.0364	80/20	14.0364
937481	AD2-202 C O1	1.1144	80/20	1.1144
938371	AE1-056 C	10.2839	80/20	10.2839
938821	AE1-108 C	35.7983	80/20	35.7983
939181	AE1-148 C O1	5.4713	80/20	5.4713
940241	AE2-006	0.5619	80/20	0.5619
940661	AE2-053 O1	2.0264	80/20	2.0264
941011	AE2-092 C	29.1911	80/20	29.1911
941791	AE2-182 C	3.2479	80/20	3.2479
942451	AE2-258	1.8649	80/20	1.8649
942461	AE2-259 C O1	18.9528	80/20	18.9528
942751	AE2-291 C O1	3.7718	80/20	3.7718
942761	AE2-292 C O1	4.6962	80/20	4.6962
943901	AF1-058 C	0.9984	80/20	0.9984
943911	AF1-059	9.5960	80/20	9.5960
945811	AF1-246 C O1	3.2617	80/20	3.2617
946281	AF1-292 C	0.4551	80/20	0.4551
946291	AF1-293 C O1	47.0478	80/20	47.0478
946301	AF1-294 C	6.0747	80/20	6.0747
946591	AF1-323 C	11.4715	80/20	11.4715
957481	AF2-042 C O1	23.7450	80/20	23.7450
958131	AF2-107 C	6.0592	80/20	6.0592
958211	AF2-115 C	3.7041	80/20	3.7041
958801	AF2-171 C O1	22.0788	80/20	22.0788
959311	AF2-222 C	20.1270	80/20	20.1270
959751	AF2-266 O1	4.8210	80/20	4.8210
960061	AF2-297 C O1	3.9936	80/20	3.9936
960081	AF2-299 C	0.7671	80/20	0.7671
960111	AF2-302 C	4.1714	80/20	4.1714
960811	AF2-372 C	0.9790	80/20	0.9790
960821	AF2-373 C	0.5906	80/20	0.5906
961061	AF2-397 C O1	49.8186	80/20	49.8186
961081	AF2-399 C	0.4779	80/20	0.4779
WEC	WEC	0.1254	Confirmed LTF	0.1254
LGEE	LGEE	0.2482	Confirmed LTF	0.2482
CPL	CPL	2.1704	Confirmed LTF	2.1704
CBM-W2	CBM-W2	6.5766	Confirmed LTF	6.5766
NY	NY	0.4302	Confirmed LTF	0.4302
CBM-W1	CBM-W1	4.4035	Confirmed LTF	4.4035
TVA	TVA	1.4980	Confirmed LTF	1.4980
CBM-S2	CBM-S2	14.4558	Confirmed LTF	14.4558
CBM-S1	CBM-S1	8.1110	Confirmed LTF	8.1110

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
MADISON	MADISON	0.5443	Confirmed LTF	0.5443
MEC	MEC	0.8692	Confirmed LTF	0.8692
AA2-074	AA2-074	1.4778	LTF	1.4778

## 11.7 Queue Dependencies

The Queue Projects below are listed in one or more indices for the overloads identified in your report. These projects contribute to the loading of the overloaded facilities identified in your report. The percent overload of a facility and cost allocation you may have towards a particular reinforcement could vary depending on the action of these earlier projects. The status of each project at the time of the analysis is presented in the table. This list may change as earlier projects withdraw or modify their requests.

Queue Number	Project Name	Status
AA2-074	CPLP-PJM	Confirmed
AA2-127	Bear Garden 230kV	In Service
AB2-043	Chase City 115kV	Under Construction
AB2-045	Buckingham 34.5kV	In Service
AB2-060	Chase City-Lunenburg 115kV	Under Construction
AB2-077	Buggs Island-Chase City 115kV	Suspended
AB2-078	Buggs Island-Chase City 115kV	Suspended
AB2-079	Buggs Island-Chase City 115kV	Suspended
AB2-174	Emporia-Trego 115kV	Under Construction
AC1-036	Twittys Creek 34.5kV	Engineering and Procurement
AC1-054	Kerr Dam-Eatons Ferry 115 kV	Engineering and Procurement
AC1-062	Jetersville 34.5kV	In Service
AC1-075	Perth-Hickory Grove 115kV	Engineering and Procurement
AC1-080	Perth-Hickory Grove 115kV	Engineering and Procurement
AC1-105	Halifax-Mt. Laurel 115kV	Suspended
AC1-116	Mount Eagle 34.5kV	Engineering and Procurement
AC1-221	Halifax-Person 230kV	Engineering and Procurement
AC1-222	Crystal Hill-Halifax 115kV	Engineering and Procurement
AC2-071	Buckingham 35kV	Engineering and Procurement
AC2-100	Halifax-Person 230kV	Active
AC2-165	Bremo-Powhatan 230kV	Active
AD1-055	Crystal Hill-Halifax 115 kV	Engineering and Procurement
AD1-058	Halifax-Person 230 kV	Engineering and Procurement
AD1-087	Clover-Sedge Hill 230 kV	Active
AD1-088	Briery-Clover 230 kV	Active
AD1-131	Sedge Hill-Person 230 kV	Active
AD1-152	Clover-Sedge Hill 230 kV	Active
AD1-157	South Creek 34.5 kV	Engineering and Procurement
AD2-033	Chase City-Lunenburg 115 kV	Active
AD2-046	Boydton DP-Kerr Dam 115 kV	Active
AD2-063	Central-Chase City 115kV	Active
AD2-202	Clover-Sedge Hill 230kV	Active
AE1-056	Red House-South Creek 115 kV	Active

Queue Number	Project Name	Status
AE1-075	Powhatan 34.5 kV	Engineering and Procurement
AE1-108	Bremo-Scottsville 138 kV	Active
AE1-148	Kerr Dam-Ridge Rd 115 kV	Active
AE2-006	Twittys Creek 34.5 kV	Engineering and Procurement
AE2-053	Kerr Dam-Ridge Road 115 kV	Active
AE2-092	Kidds Store-Sherwood 115 kV	Active
AE2-182	Briery-Clover 230 kV	Active
AE2-258	Chase City 115 kV	Active
AE2-259	Curdsville-Willis Mtn 115 kV	Active
AE2-291	Grit DP-Perth 115 kV	Active
AE2-292	Grit DP-Perth 115 kV	Active
AF1-058	Welco 34.5 kV	Engineering and Procurement
AF1-059	Brodnax-South Hill 115 kV	Active
AF1-246	Clover-Rawlings 500 kV	Active
AF1-292	Fields Crossroads 34.5 kV	Active
AF1-293	Kidds Store-Fort Union 115 kV	Active
AF1-294	Jetersville-Ponton 115 kV	Active
AF1-323	Scottsville-Colleen 138 kV	Active
AF2-042	Clover 500 kV	Active
AF2-107	Clifford 138 kV	Active
AF2-115	Jetersville-Ponton 115 kV	Active
AF2-144	Powhatan 34.5 kV	Active
AF2-171	Madisonville 115 kV	Active
AF2-222	Madisonville DP-Twitty's Creek 115 kV	Active
AF2-266	Clover 230 kV	Active
AF2-297	Sedge Hill 115 kV	Active
AF2-299	Fields 34.5 kV	Active
AF2-302	Scottsville-Colleen 138 kV	Active
AF2-372	Black Branch 34.5 kV	Active
AF2-373	Mount Laurel 115 kV	Active
AF2-397	Fork Union-Mt. Eagle 230 kV	Active
AF2-399	Crewe 12.5 kV	Active

## 11.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
DVP_P1-2: LN 556-B	CONTINGENCY 'DVP_P1-2: LN 556-B' OPEN BRANCH FROM BUS 945810 TO BUS 314936 CKT 1 /* AF1-246 TAP 500.00 - 8RAWLINGS 500.00 END
DVP_P4-2: 556T591	CONTINGENCY 'DVP_P4-2: 556T591' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 945810 TO BUS 314936 CKT 1 /* AF1-246 TAP 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 314935 TO BUS 314936 CKT 1 /* 8HERITAGE 500.00 - 8RAWLINGS 500.00 END

Contingency Name	Contingency Definition
<b>DVP_P1-2: LN 2027-B</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 OPEN BUS 923862 /* ISLAND: AB2-026 E 230.00 END
<b>DVP_P1-2: LN 2028-A</b>	CONTINGENCY 'DVP_P1-2: LN 2028-A' OPEN BRANCH FROM BUS 961060 TO BUS 314765 CKT 1 /* AF2-397 TAP 230.00 - 6MTEAGLE 230.00 OPEN BRANCH FROM BUS 314749 TO BUS 314765 CKT 1 /* 6CHARLVL 230.00 - 6MTEAGLE 230.00 OPEN BUS 314765 /* ISLAND: 6MTEAGLE 230.00 OPEN BUS 926451 /* ISLAND: AC1-116 C 230.00 OPEN BUS 926452 /* ISLAND: AC1-116 E 230.00 END
<b>Base Case</b>	
<b>DVP_P4-2: 511T591</b>	CONTINGENCY 'DVP_P4-2: 511T591' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 940470 TO BUS 314936 CKT 1 /* AE2-031 TAP 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 314935 TO BUS 314936 CKT 1 /* 8HERITAGE 500.00 - 8RAWLINGS 500.00 END
<b>DVP_P4-2: 511T556-A</b>	CONTINGENCY 'DVP_P4-2: 511T556-A' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 940470 TO BUS 314936 CKT 1 /* AE2-031 TAP 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 945810 TO BUS 314936 CKT 1 /* AF1-246 TAP 500.00 - 8RAWLINGS 500.00 END
<b>314333 6POWHATN 230 933500 AC2-165 TAP 230 1</b>	CONTINGENCY '314333 6POWHATN 230 933500 AC2-165 TAP 230 1' OPEN BRANCH FROM BUS 314333 TO BUS 933500 CKT 1 END

## 12 Short Circuit Analysis - Primary POI

Short circuit analysis will be provided in the System Impact Study report.

### **13 Summer Peak - Load Flow Analysis - Secondary POI**

The Queue Project AF2-397 was evaluated as a 130.0 MW (Capacity 78.0 MW) injection tapping the Bremono to Cunningham 115 kV line in the Dominion area. Project AF2-397 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-397 was studied with a commercial probability of 53%. Potential network impacts were as follows:

### 13.1 Generation Deliverability

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

None

### 13.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC D C	MW IMPACT
145200797	242563	05BOXWD	138.0	AEP	242765	05REUSE N	138.0	AEP	1	DVP_P2 -2: BREMO B4	bus	167.0	79.74	144.28	DC	107.78
145201099	242563	05BOXWD	138.0	AEP	242765	05REUSE N	138.0	AEP	1	DVP_P4 -2: 422	breaker	167.0	79.74	144.28	DC	107.78
145200810	242792	05SCOTSV	138.0	AEP	946590	AF1-323 TAP	138.0	AEP	1	DVP_P2 -2: BREMO B4	bus	167.0	67.49	140.14	DC	121.33
145201112	242792	05SCOTSV	138.0	AEP	946590	AF1-323 TAP	138.0	AEP	1	DVP_P4 -2: 422	breaker	167.0	67.49	140.14	DC	121.33
144472798	938820	AE1-108 TAP	138.0	DVP	242792	05SCOTSV	138.0	AEP	1	DVP_P2 -2: BREMO B4	bus	167.0	81.08	158.92	DC	130.0
144472983	938820	AE1-108 TAP	138.0	DVP	242792	05SCOTSV	138.0	AEP	1	DVP_P4 -2: 422	breaker	167.0	81.08	158.92	DC	130.0

### 13.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC D C	MW IMPACT
95969255	242603	05CLIFFR	138.0	AEP	242563	05BOXWD	138.0	AEP	1	DVP_P2-2: BREMO B4	bus	167.0	111.95	176.49	DC	107.78
95969451	242603	05CLIFFR	138.0	AEP	242563	05BOXWD	138.0	AEP	1	DVP_P4-2: 422	breaker	167.0	111.95	176.49	DC	107.78
95969271	242613	05COLLEENSS	138.0	AEP	242603	05CLIFFR	138.0	AEP	1	DVP_P2-2: BREMO B4	bus	167.0	107.27	179.92	DC	121.33
95969466	242613	05COLLEENSS	138.0	AEP	242603	05CLIFFR	138.0	AEP	1	DVP_P4-2: 422	breaker	167.0	107.27	179.92	DC	121.33
149308145	313707	6FORK UNION	230.0	DVP	314765	6MTEAGLE	230.0	DVP	1	DVP_P1-2: LN 2027-B	single	661.760009766	122.79	128.55	DC	38.18
149308146	313707	6FORK UNION	230.0	DVP	314765	6MTEAGLE	230.0	DVP	1	314333 6POWHA TN 230 933500 AC2-165 TAP 230 1	single	661.760009766	122.73	128.49	DC	38.18
98161949	313867	6BREMODIST	230.0	DVP	313707	6FORK UNION	230.0	DVP	1	DVP_P1-2: LN 2027-B	single	661.760009766	123.91	125.77	DC	12.29

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
98161950	313867	6BREMODIST	230.0	DVP	313707	6FORK UNION	230.0	DVP	1	314333 6POWHA TN 230 933500 AC2-165 TAP 230 1	single	661.760009766	123.83	125.69	DC	12.29
97838761	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	DVP_P4-2: 511T591	breaker	699.0	151.07	151.62	DC	7.83
97838762	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	DVP_P4-2: 556T591	breaker	699.0	151.16	151.71	DC	7.83
97838763	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	DVP_P4-2: 511T556	breaker	699.0	151.16	151.71	DC	7.83
97838776	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	DVP_P4-2: 511T591	breaker	684.0	150.32	150.88	DC	7.83
97838777	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	DVP_P4-2: 511T556	breaker	684.0	150.41	150.97	DC	7.83
97838778	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	DVP_P4-2: 556T591	breaker	684.0	150.41	150.97	DC	7.83
106557993	314697	6SEEDGE HILL	230.0	DVP	927250	AC1-221 TAP	230.0	DVP	1	DVP_P1-2: LN 556-A	single	674.91998291	110.74	111.06	DC	7.32
149307949	314697	6SEEDGE HILL	230.0	DVP	927250	AC1-221 TAP	230.0	DVP	1	314906 8CLOVER 500 945810 AF1-246 TAP 500 1	single	674.91998291	110.74	111.06	DC	7.32
98161929	314747	6BREMO	230.0	DVP	313867	6BREMODIST	230.0	DVP	1	DVP_P1-2: LN 2027-B	single	661.760009766	126.28	128.14	DC	12.29
98161930	314747	6BREMO	230.0	DVP	313867	6BREMODIST	230.0	DVP	1	314333 6POWHA TN 230 933500 AC2-165 TAP 230 1	single	661.760009766	126.21	128.06	DC	12.29
98161882	314765	6MTEAGLE	230.0	DVP	314749	6CHARLVL	230.0	DVP	1	DVP_P1-2: LN 2027-B	single	661.760009766	119.65	125.42	DC	38.18
98161883	314765	6MTEAGLE	230.0	DVP	314749	6CHARLVL	230.0	DVP	1	314333 6POWHA TN 230 933500 AC2-165 TAP 230 1	single	661.760009766	119.6	125.37	DC	38.18
95969263	946590	AF1-323 TAP	138.0	AEP	242613	05COLLEENSS	138.0	AEP	1	DVP_P2-2: BREMO B4	bus	167.0	109.48	182.14	DC	121.33
95969460	946590	AF1-323 TAP	138.0	AEP	242613	05COLLEENSS	138.0	AEP	1	DVP_P4-2: 422	breaker	167.0	109.48	182.14	DC	121.33

### 13.4 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
149308141	313707	6FORK UNION	230.0	DVP	314765	6MTEAGLE	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	141.72	151.33	DC	63.63
149308151	313707	6FORK UNION	230.0	DVP	314765	6MTEAGLE	230.0	DVP	1	Base Case	operati on	661.760009766	95.5	102.45	DC	45.89
98161945	313867	6BREMODIST	230.0	DVP	313707	6FORK UNION	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	140.16	143.27	DC	20.49
149308575	313868	6CARTERV	230.0	DVP	933500	AC2-165 TAP	230.0	DVP	1	DVP_P 1-2: LN 2028	operati on	800.880004883	101.64	108.33	DC	53.62
149308509	314310	6JUDES F	230.0	DVP	314322	6MDLTHAN	230.0	DVP	1	DVP_P 1-2: LN 2028	operati on	800.880004883	108.78	115.47	DC	53.61
149308459	314333	6POWHATN	230.0	DVP	314310	6JUDES F	230.0	DVP	1	DVP_P 1-2: LN 2028	operati on	800.880004883	112.58	119.28	DC	53.61
106558045	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	571.520019531	181.84	182.52	DC	7.83
106558302	314686	6CLOVER	230.0	DVP	934610	AD1-087 TAP	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	814.979980469	140.37	141.07	DC	12.65
106558056	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	559.299987793	180.84	181.53	DC	7.82
98161925	314747	6BREMO	230.0	DVP	313867	6BREMODIST	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	142.53	145.64	DC	20.49
149308550	314747	6BREMO	230.0	DVP	313868	6CARTERV	230.0	DVP	1	DVP_P 1-2: LN 2028	operati on	800.880004883	102.39	109.08	DC	53.62
98161878	314765	6MTEAGLE	230.0	DVP	314749	6CHARLVL	230.0	DVP	1	DVP_P 1-2: LN 2027-B	operati on	661.760009766	139.27	148.89	DC	63.63
149308501	933500	AC2-165 TAP	230.0	DVP	314333	6POWHATN	230.0	DVP	1	DVP_P 1-2: LN 2028	operati on	800.880004883	108.8	115.49	DC	53.62
106558182	934610	AD1-087 TAP	230.0	DVP	314697	6SEGE HILL	230.0	DVP	1	DVP_P 1-2: LN 556-B	operati on	814.979980469	152.04	152.73	DC	12.65
97581056	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	Base Case	operati on	156.979995728	112.13	116.0	DC	6.08
150492321	941010	AE2-092 TAP	115.0	DVP	314774	3SHERWOD	115.0	DVP	1	DVP_P 1-2: LN 2028	operati on	169.199996948	117.1	129.02	DC	20.16

### 13.5 Flow Gate Details - Secondary POI

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

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### 13.5.1 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
145201099	242563	05BOXWD	AEP	242765	05REUSEN	AEP	1	DVP_P4-2: 422	breaker	167.0	79.74	144.28	DC	107.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938821	AE1-108 C	76.1123	50/50	76.1123
938822	AE1-108 E	50.7415	50/50	50.7415
946591	AF1-323 C	27.3679	50/50	27.3679
946592	AF1-323 E	18.2453	50/50	18.2453
958131	AF2-107 C	27.0151	50/50	27.0151
958132	AF2-107 E	14.8039	50/50	14.8039
960111	AF2-302 C	9.9520	50/50	9.9520
960112	AF2-302 E	6.6346	50/50	6.6346
961061	AF2-397 C O2	64.6706	50/50	64.6706
961062	AF2-397 E O2	43.1137	50/50	43.1137
NEWTON	NEWTON	0.0032	Confirmed LTF	0.0032
CPLE	CPLE	0.0093	Confirmed LTF	0.0093
FARMERCITY	FARMERCITY	0.0001	Confirmed LTF	0.0001
G-007A	G-007A	0.0024	Confirmed LTF	0.0024
VFT	VFT	0.0064	Confirmed LTF	0.0064
PRAIRIE	PRAIRIE	0.0052	Confirmed LTF	0.0052
EDWARDS	EDWARDS	0.0010	Confirmed LTF	0.0010
CBM-S2	CBM-S2	0.0462	Confirmed LTF	0.0462
TILTON	TILTON	0.0019	Confirmed LTF	0.0019
MADISON	MADISON	0.0040	Confirmed LTF	0.0040
GIBSON	GIBSON	0.0016	Confirmed LTF	0.0016
BLUEG	BLUEG	0.0052	Confirmed LTF	0.0052
TRIMBLE	TRIMBLE	0.0017	Confirmed LTF	0.0017

13.5.2 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
145201112	242792	05SCOTSV	AEP	946590	AF1-323 TAP	AEP	1	DVP_P4-2: 422	breaker	167.0	67.49	140.14	DC	121.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938821	AE1-108 C	85.6797	50/50	85.6797
938822	AE1-108 E	57.1198	50/50	57.1198
961061	AF2-397 C O2	72.7997	50/50	72.7997
961062	AF2-397 E O2	48.5332	50/50	48.5332
CPL	CPL	0.0007	Confirmed LTF	0.0007

### 13.5.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
144472983	938820	AE1-108 TAP	DVP	242792	05SCOTSV	AEP	1	DVP_P4-2: 422	breaker	167.0	81.08	158.92	DC	130.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938821	AE1-108 C	91.8000	50/50	91.8000
938822	AE1-108 E	61.2000	50/50	61.2000
961061	AF2-397 C O2	78.0000	50/50	78.0000
961062	AF2-397 E O2	52.0000	50/50	52.0000

13.5.4 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
95969451	242603	05CLIFFR	AEP	242563	05BOXWD	AEP	1	DVP_P4-2: 422	breaker	167.0	111.95	176.49	DC	107.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938821	AE1-108 C	76.1123	50/50	76.1123
938822	AE1-108 E	50.7415	50/50	50.7415
946591	AF1-323 C	27.3679	50/50	27.3679
946592	AF1-323 E	18.2453	50/50	18.2453
958131	AF2-107 C	27.0151	50/50	27.0151
958132	AF2-107 E	14.8039	50/50	14.8039
960111	AF2-302 C	9.9520	50/50	9.9520
960112	AF2-302 E	6.6346	50/50	6.6346
961061	AF2-397 C O2	64.6706	50/50	64.6706
961062	AF2-397 E O2	43.1137	50/50	43.1137
NEWTON	NEWTON	0.0032	Confirmed LTF	0.0032
CPLE	CPLE	0.0093	Confirmed LTF	0.0093
FARMERCITY	FARMERCITY	0.0001	Confirmed LTF	0.0001
G-007A	G-007A	0.0024	Confirmed LTF	0.0024
VFT	VFT	0.0064	Confirmed LTF	0.0064
PRAIRIE	PRAIRIE	0.0052	Confirmed LTF	0.0052
EDWARDS	EDWARDS	0.0010	Confirmed LTF	0.0010
CBM-S2	CBM-S2	0.0462	Confirmed LTF	0.0462
TILTON	TILTON	0.0019	Confirmed LTF	0.0019
MADISON	MADISON	0.0040	Confirmed LTF	0.0040
GIBSON	GIBSON	0.0016	Confirmed LTF	0.0016
BLUEG	BLUEG	0.0052	Confirmed LTF	0.0052
TRIMBLE	TRIMBLE	0.0017	Confirmed LTF	0.0017

13.5.5 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
95969466	242613	05COLLEEN SS	AEP	242603	05CLIFFR	AEP	1	DVP_P4-2: 422	breaker	167.0	107.27	179.92	DC	121.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938821	AE1-108 C	85.6797	50/50	85.6797
938822	AE1-108 E	57.1198	50/50	57.1198
946591	AF1-323 C	30.8590	50/50	30.8590
946592	AF1-323 E	20.5726	50/50	20.5726
960111	AF2-302 C	11.2214	50/50	11.2214
960112	AF2-302 E	7.4810	50/50	7.4810
961061	AF2-397 C O2	72.7997	50/50	72.7997
961062	AF2-397 E O2	48.5332	50/50	48.5332
CPLE	CPLE	0.0007	Confirmed LTF	0.0007

### 13.5.6 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
149308146	313707	6FORK UNION	DVP	314765	6MTEAGLE	DVP	1	314333 6POWHATN 230 933500 AC2-165 TAP 230 1	single	661.76	122.73	128.49	DC	38.18

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1363	80/20	0.1363
314429	3JTRSVLE	0.5452	80/20	0.5452
314572	3EMPORIA	0.0219	80/20	0.0219
314677	6BUCKING	1.0694	80/20	1.0694
314704	3LAWRENC	0.1423	80/20	0.1423
315153	1CLOVER1	7.3430	80/20	7.3430
315154	1CLOVER2	7.2698	80/20	7.2698
315158	1KERR 1	0.2422	80/20	0.2422
315159	1KERR 2	0.6782	80/20	0.6782
315160	1KERR 3	0.6782	80/20	0.6782
315161	1KERR 4	0.6782	80/20	0.6782
315162	1KERR 5	0.6782	80/20	0.6782
315163	1KERR 6	0.6782	80/20	0.6782
315164	1KERR 7	0.6782	80/20	0.6782
315191	1BEARGRDN G1	15.0842	80/20	15.0842
315192	1BEARGRDN G2	15.0842	80/20	15.0842
315193	1BEARGRDN S1	31.0443	80/20	31.0443
315266	1PLYWOOD A	0.6953	80/20	0.6953
920291	AA2-127	3.1336	80/20	3.1336
924021	AB2-043 C O1	0.4312	80/20	0.4312
924161	AB2-060 C OP	1.2758	80/20	1.2758
924301	AB2-077 C O1 (Suspended)	1.5499	80/20	1.5499
924311	AB2-078 C O1 (Suspended)	1.5499	80/20	1.5499
924321	AB2-079 C O1 (Suspended)	1.5499	80/20	1.5499
925171	AB2-174 C O1	0.3622	80/20	0.3622
925611	AC1-036 C	1.1045	80/20	1.1045
925781	AC1-054 C O1	3.6512	80/20	3.6512
925831	AC1-062	0.0809	80/20	0.0809
925991	AC1-075 C	2.5684	80/20	2.5684
926021	AC1-080 C	0.8584	80/20	0.8584
926271	AC1-105 C O1 (Suspended)	3.1786	80/20	3.1786
926451	AC1-116 C	-0.9024	Adder	-1.06
927251	AC1-221 C	0.7555	80/20	0.7555
927261	AC1-222 C	1.8244	80/20	1.8244
932511	AC2-071 C	6.1076	80/20	6.1076
932761	AC2-100 C	1.7388	80/20	1.7388

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
933501	AC2-165 C	32.1571	80/20	32.1571
934311	AD1-055 C	1.2668	80/20	1.2668
934341	AD1-058 C	1.8940	80/20	1.8940
934611	AD1-087 C O1	4.2050	80/20	4.2050
934621	AD1-088 C	19.9913	80/20	19.9913
934991	AD1-131 C	0.6210	80/20	0.6210
935171	AD1-152 C O1	4.1789	80/20	4.1789
935221	AD1-157 C	2.3854	80/20	2.3854
936261	AD2-033 C	14.2459	80/20	14.2459
936361	AD2-046 C O1	5.4614	80/20	5.4614
936481	AD2-063 C O1	14.0364	80/20	14.0364
937481	AD2-202 C O1	1.1144	80/20	1.1144
938371	AE1-056 C	10.2839	80/20	10.2839
938821	AE1-108 C	35.7983	80/20	35.7983
939181	AE1-148 C O1	5.4713	80/20	5.4713
940241	AE2-006	0.5619	80/20	0.5619
940661	AE2-053 O1	2.0264	80/20	2.0264
941011	AE2-092 C	29.1911	80/20	29.1911
941791	AE2-182 C	3.2479	80/20	3.2479
942451	AE2-258	1.8649	80/20	1.8649
942461	AE2-259 C O1	18.9528	80/20	18.9528
942751	AE2-291 C O1	3.7718	80/20	3.7718
942761	AE2-292 C O1	4.6962	80/20	4.6962
943901	AF1-058 C	0.9984	80/20	0.9984
943911	AF1-059	9.5960	80/20	9.5960
945811	AF1-246 C O1	3.2617	80/20	3.2617
946281	AF1-292 C	0.4551	80/20	0.4551
946291	AF1-293 C O1	47.0478	80/20	47.0478
946301	AF1-294 C	6.0747	80/20	6.0747
946591	AF1-323 C	11.4715	80/20	11.4715
957481	AF2-042 C O2	23.2980	80/20	23.2980
958131	AF2-107 C	6.0592	80/20	6.0592
958211	AF2-115 C	3.7041	80/20	3.7041
958801	AF2-171 C O2	22.5495	80/20	22.5495
959311	AF2-222 C	20.1270	80/20	20.1270
959751	AF2-266 O2	3.8830	80/20	3.8830
960061	AF2-297 C O2	3.7296	80/20	3.7296
960081	AF2-299 C	0.7671	80/20	0.7671
960111	AF2-302 C	4.1714	80/20	4.1714
960811	AF2-372 C	0.9790	80/20	0.9790
960821	AF2-373 C	0.5906	80/20	0.5906
961061	AF2-397 C O2	38.1787	80/20	38.1787
961081	AF2-399 C	0.4779	80/20	0.4779
WEC	WEC	0.1254	Confirmed LTF	0.1254
LGEE	LGEE	0.2482	Confirmed LTF	0.2482
CPL	CPL	2.1704	Confirmed LTF	2.1704
CBM-W2	CBM-W2	6.5766	Confirmed LTF	6.5766
NY	NY	0.4302	Confirmed LTF	0.4302
CBM-W1	CBM-W1	4.4035	Confirmed LTF	4.4035
TVA	TVA	1.4980	Confirmed LTF	1.4980
CBM-S2	CBM-S2	14.4558	Confirmed LTF	14.4558
CBM-S1	CBM-S1	8.1110	Confirmed LTF	8.1110

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>MADISON</b>	MADISON	0.5443	Confirmed LTF	0.5443
<b>MEC</b>	MEC	0.8692	Confirmed LTF	0.8692
<b>AA2-074</b>	AA2-074	1.4778	LTF	1.4778

### 13.5.7 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
98161950	313867	6BREMODIST	DVP	313707	6FORK UNION	DVP	1	314333 6POWHATN 230 933500 AC2-165 TAP 230 1	single	661.76	123.83	125.69	DC	12.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1491	80/20	0.1491
314429	3JTRSVLE	0.5962	80/20	0.5962
314572	3EMPORIA	0.0240	80/20	0.0240
314677	6BUCKING	1.1738	80/20	1.1738
314704	3LAWRENC	0.1552	80/20	0.1552
315153	1CLOVER1	8.0124	80/20	8.0124
315154	1CLOVER2	7.9325	80/20	7.9325
315158	1KERR 1	0.2616	80/20	0.2616
315159	1KERR 2	0.7325	80/20	0.7325
315160	1KERR 3	0.7325	80/20	0.7325
315161	1KERR 4	0.7325	80/20	0.7325
315162	1KERR 5	0.7325	80/20	0.7325
315163	1KERR 6	0.7325	80/20	0.7325
315164	1KERR 7	0.7325	80/20	0.7325
315191	1BEARGRDN G1	16.5646	80/20	16.5646
315192	1BEARGRDN G2	16.5646	80/20	16.5646
315193	1BEARGRDN S1	34.0910	80/20	34.0910
315266	1PLYWOOD A	0.7353	80/20	0.7353
920291	AA2-127	3.4412	80/20	3.4412
923572	AB1-173 C OP	0.7332	80/20	0.7332
923582	AB1-173AC OP	0.7332	80/20	0.7332
923911	AB2-031 C O1	0.7278	80/20	0.7278
923991	AB2-040 C O1	2.3896	80/20	2.3896
924021	AB2-043 C O1	0.4676	80/20	0.4676
924161	AB2-060 C OP	1.3842	80/20	1.3842
924301	AB2-077 C O1 (Suspended)	1.6795	80/20	1.6795
924311	AB2-078 C O1 (Suspended)	1.6795	80/20	1.6795
924321	AB2-079 C O1 (Suspended)	1.6795	80/20	1.6795
925171	AB2-174 C O1	0.3972	80/20	0.3972
925611	AC1-036 C	1.2045	80/20	1.2045
925781	AC1-054 C O1	3.9503	80/20	3.9503
925831	AC1-062	0.0885	80/20	0.0885
925991	AC1-075 C	2.3895	80/20	2.3895
926021	AC1-080 C	0.7986	80/20	0.7986
926271	AC1-105 C O1 (Suspended)	3.3692	80/20	3.3692
926451	AC1-116 C	-0.7531	Adder	-0.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
927251	AC1-221 C	0.7912	80/20	0.7912
927261	AC1-222 C	1.8753	80/20	1.8753
932511	AC2-071 C	6.7040	80/20	6.7040
932761	AC2-100 C	1.8208	80/20	1.8208
933501	AC2-165 C	35.3138	80/20	35.3138
934311	AD1-055 C	1.3021	80/20	1.3021
934341	AD1-058 C	1.9834	80/20	1.9834
934611	AD1-087 C O1	4.5455	80/20	4.5455
934621	AD1-088 C	21.9177	80/20	21.9177
934991	AD1-131 C	0.6503	80/20	0.6503
935171	AD1-152 C O1	4.5173	80/20	4.5173
935221	AD1-157 C	2.6102	80/20	2.6102
936261	AD2-033 C	15.5243	80/20	15.5243
936361	AD2-046 C O1	5.9036	80/20	5.9036
936481	AD2-063 C O1	15.2622	80/20	15.2622
937481	AD2-202 C O1	1.2046	80/20	1.2046
938371	AE1-056 C	11.2528	80/20	11.2528
938821	AE1-108 C	11.6026	80/20	11.6026
939181	AE1-148 C O1	5.9157	80/20	5.9157
940241	AE2-006	0.6128	80/20	0.6128
940661	AE2-053 O1	2.1910	80/20	2.1910
941791	AE2-182 C	3.5609	80/20	3.5609
942451	AE2-258	2.0222	80/20	2.0222
942461	AE2-259 C O1	20.7678	80/20	20.7678
942751	AE2-291 C O1	3.3042	80/20	3.3042
942761	AE2-292 C O1	4.1140	80/20	4.1140
943901	AF1-058 C	1.0482	80/20	1.0482
943911	AF1-059	10.4370	80/20	10.4370
945811	AF1-246 C O1	3.5725	80/20	3.5725
946281	AF1-292 C	0.4998	80/20	0.4998
946291	AF1-293 C O1	6.7728	80/20	6.7728
946301	AF1-294 C	6.6427	80/20	6.6427
946591	AF1-323 C	3.7326	80/20	3.7326
957481	AF2-042 C O2	25.5180	80/20	25.5180
958131	AF2-107 C	2.0323	80/20	2.0323
958211	AF2-115 C	4.0505	80/20	4.0505
958801	AF2-171 C O2	24.6609	80/20	24.6609
959311	AF2-222 C	21.9610	80/20	21.9610
959751	AF2-266 O2	4.2530	80/20	4.2530
960061	AF2-297 C O2	3.9840	80/20	3.9840
960081	AF2-299 C	0.8424	80/20	0.8424
960111	AF2-302 C	1.3573	80/20	1.3573
960811	AF2-372 C	1.0609	80/20	1.0609
960821	AF2-373 C	0.6309	80/20	0.6309
961061	AF2-397 C O2	12.2920	80/20	12.2920
961081	AF2-399 C	0.5225	80/20	0.5225
WEC	WEC	0.0636	Confirmed LTF	0.0636
LGEE	LGEE	0.1278	Confirmed LTF	0.1278
CPL	CPL	2.2326	Confirmed LTF	2.2326
CBM-W2	CBM-W2	5.0614	Confirmed LTF	5.0614
NY	NY	0.4015	Confirmed LTF	0.4015
CBM-W1	CBM-W1	2.0391	Confirmed LTF	2.0391

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>TVA</b>	TVA	1.2404	Confirmed LTF	1.2404
<b>CBM-S2</b>	CBM-S2	14.2882	Confirmed LTF	14.2882
<b>CBM-S1</b>	CBM-S1	6.5008	Confirmed LTF	6.5008
<b>MADISON</b>	MADISON	0.5786	Confirmed LTF	0.5786
<b>MEC</b>	MEC	0.5641	Confirmed LTF	0.5641
<b>AA2-074</b>	AA2-074	1.5188	LTF	1.5188

13.5.8 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
97838763	314677	6BUCKING	DVP	314747	6BREMO	DVP	1	DVP_P4-2: 511T556	breaker	699.0	151.16	151.71	DC	7.83

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.2225	50/50	0.2225
314429	3JTRSVLE	0.8900	50/50	0.8900
314677	6BUCKING	1.6254	50/50	1.6254
315153	1CLOVER1	22.4668	50/50	22.4668
315154	1CLOVER2	22.2429	50/50	22.2429
924022	AB2-043 E O1	3.2830	Adder	3.86
924032	AB2-045 E	4.3975	50/50	4.3975
924162	AB2-060 E OP	5.0960	Adder	6.0
924301	AB2-077 C O1 (Suspended)	2.2889	Adder	2.69
924302	AB2-077 E O1 (Suspended)	1.5259	Adder	1.8
924311	AB2-078 C O1 (Suspended)	2.2889	Adder	2.69
924312	AB2-078 E O1 (Suspended)	1.5259	Adder	1.8
924321	AB2-079 C O1 (Suspended)	2.2889	Adder	2.69
924322	AB2-079 E O1 (Suspended)	1.5259	Adder	1.8
925611	AC1-036 C	1.8363	50/50	1.8363
925612	AC1-036 E	2.9961	50/50	2.9961
925781	AC1-054 C O1	5.1714	Adder	6.08
925782	AC1-054 E O1	2.3823	Adder	2.8
925831	AC1-062	0.1321	50/50	0.1321
925991	AC1-075 C	4.2224	Adder	4.97
925992	AC1-075 E	2.3923	Adder	2.81
926021	AC1-080 C	1.4111	Adder	1.66
926022	AC1-080 E	0.7938	Adder	0.93
926271	AC1-105 C O1 (Suspended)	5.7567	Adder	6.77
926272	AC1-105 E O1 (Suspended)	2.8657	Adder	3.37
926451	AC1-116 C	-0.3880	Adder	-0.46
927251	AC1-221 C	1.4229	Adder	1.67
927252	AC1-221 E	1.4229	Adder	1.67
927261	AC1-222 C	3.4591	Adder	4.07
927262	AC1-222 E	3.2930	Adder	3.87
932511	AC2-071 C	9.2835	50/50	9.2835
932512	AC2-071 E	4.6767	50/50	4.6767
932761	AC2-100 C	3.2747	Adder	3.85
932762	AC2-100 E	1.5984	Adder	1.88

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934311	AD1-055 C	2.4018	Adder	2.83
934312	AD1-055 E	0.6193	Adder	0.73
934341	AD1-058 C	3.5671	Adder	4.2
934342	AD1-058 E	0.9064	Adder	1.07
934611	AD1-087 C O1	10.2490	Adder	12.06
934612	AD1-087 E O1	4.8168	Adder	5.67
934621	AD1-088 C	35.2759	50/50	35.2759
934622	AD1-088 E	16.6004	50/50	16.6004
934991	AD1-131 C	1.1695	Adder	1.38
934992	AD1-131 E	0.7797	Adder	0.92
935171	AD1-152 C O1	10.1853	Adder	11.98
935172	AD1-152 E O1	6.7902	Adder	7.99
935221	AD1-157 C	3.8759	50/50	3.8759
935222	AD1-157 E	2.5840	50/50	2.5840
936261	AD2-033 C	23.8079	50/50	23.8079
936262	AD2-033 E	15.8720	50/50	15.8720
936361	AD2-046 C O1	7.9875	Adder	9.4
936362	AD2-046 E O1	3.6731	Adder	4.32
936481	AD2-063 C O1	20.2427	Adder	23.81
936482	AD2-063 E O1	13.3827	Adder	15.74
937481	AD2-202 C O1	2.7161	Adder	3.2
937482	AD2-202 E O1	1.5278	Adder	1.8
938371	AE1-056 C	16.7096	50/50	16.7096
938372	AE1-056 E	9.1300	50/50	9.1300
939181	AE1-148 C O1	8.0045	Adder	9.42
939182	AE1-148 E O1	5.3363	Adder	6.28
940241	AE2-006	0.9343	50/50	0.9343
940661	AE2-053 O1	2.9646	Adder	3.49
941791	AE2-182 C	5.7311	50/50	5.7311
941792	AE2-182 E	2.6679	50/50	2.6679
942451	AE2-258	2.7391	Adder	3.22
942461	AE2-259 C O1	30.4818	50/50	30.4818
942462	AE2-259 E O1	20.3212	50/50	20.3212
942751	AE2-291 C O1	5.6712	Adder	6.67
942752	AE2-291 E O1	3.7808	Adder	4.45
942761	AE2-292 C O1	7.0612	Adder	8.31
942762	AE2-292 E O1	4.7075	Adder	5.54
943901	AF1-058 C	1.9498	Adder	2.29
943902	AF1-058 E	1.2999	Adder	1.53
943911	AF1-059	13.3220	Adder	15.67
945811	AF1-246 C O1	10.5311	Adder	12.39
945812	AF1-246 E O1	17.1094	50/50	17.1094
946293	AF1-293 BAT	11.0414	Merchant Transmission	11.0414
946301	AF1-294 C	9.9165	50/50	9.9165
946302	AF1-294 E	6.6110	50/50	6.6110
957481	AF2-042 C O2	88.4970	50/50	88.4970
957482	AF2-042 E O2	58.9980	50/50	58.9980
958211	AF2-115 C	6.0467	50/50	6.0467
958212	AF2-115 E	4.0311	50/50	4.0311
958801	AF2-171 C O2	36.7731	50/50	36.7731
958802	AF2-171 E O2	24.5154	50/50	24.5154
959311	AF2-222 C	33.3580	50/50	33.3580

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959312	AF2-222 E	22.3499	50/50	22.3499
959751	AF2-266 O2	6.6446	Adder	14.75
960061	AF2-297 C O2	4.4171	Adder	9.8
960062	AF2-297 E O2	2.9448	Adder	6.54
960811	AF2-372 C	0.7663	Adder	1.7
960812	AF2-372 E	1.2505	Adder	2.78
960821	AF2-373 C	0.5309	Adder	1.18
960822	AF2-373 E	0.7963	Adder	1.77
961063	AF2-397 BAT	4.1525	Merchant Transmission	4.1525
961081	AF2-399 C	0.7802	50/50	0.7802
961082	AF2-399 E	1.3191	50/50	1.3191
WEC	WEC	0.2974	Confirmed LTF	0.2974
LGEE	LGEE	0.5619	Confirmed LTF	0.5619
CPL	CPL	3.4934	Confirmed LTF	3.4934
CBM-W2	CBM-W2	12.4079	Confirmed LTF	12.4079
NY	NY	0.3932	Confirmed LTF	0.3932
CBM-W1	CBM-W1	11.0588	Confirmed LTF	11.0588
TVA	TVA	2.6432	Confirmed LTF	2.6432
O-066	O-066	5.4835	Confirmed LTF	5.4835
CBM-S2	CBM-S2	23.4437	Confirmed LTF	23.4437
CBM-S1	CBM-S1	14.6544	Confirmed LTF	14.6544
G-007	G-007	0.8549	Confirmed LTF	0.8549
MADISON	MADISON	0.7822	Confirmed LTF	0.7822
MEC	MEC	1.8337	Confirmed LTF	1.8337
AA2-074	AA2-074	2.3805	LTF	2.3805

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
97838778	314692	6FARMVIL	DVP	314677	6BUCKING	DVP	1	DVP_P4-2:556T591	breaker	684.0	150.41	150.97	DC	7.83

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.2225	50/50	0.2225
314429	3JTRSVLE	0.8902	50/50	0.8902
315153	1CLOVER1	22.4721	50/50	22.4721
315154	1CLOVER2	22.2481	50/50	22.2481
924022	AB2-043 E O1	3.2840	Adder	3.86
924162	AB2-060 E OP	5.0975	Adder	6.0
924301	AB2-077 C O1 (Suspended)	2.2896	Adder	2.69
924302	AB2-077 E O1 (Suspended)	1.5264	Adder	1.8
924311	AB2-078 C O1 (Suspended)	2.2896	Adder	2.69
924312	AB2-078 E O1 (Suspended)	1.5264	Adder	1.8
924321	AB2-079 C O1 (Suspended)	2.2896	Adder	2.69
924322	AB2-079 E O1 (Suspended)	1.5264	Adder	1.8
925611	AC1-036 C	1.8367	50/50	1.8367
925612	AC1-036 E	2.9967	50/50	2.9967
925781	AC1-054 C O1	5.1741	Adder	6.09
925782	AC1-054 E O1	2.3836	Adder	2.8
925831	AC1-062	0.1321	50/50	0.1321
925991	AC1-075 C	4.2247	Adder	4.97
925992	AC1-075 E	2.3936	Adder	2.82
926021	AC1-080 C	1.4119	Adder	1.66
926022	AC1-080 E	0.7942	Adder	0.93
926271	AC1-105 C O1 (Suspended)	5.7587	Adder	6.77
926272	AC1-105 E O1 (Suspended)	2.8667	Adder	3.37
926451	AC1-116 C	-0.3877	Adder	-0.46
927251	AC1-221 C	1.4238	Adder	1.68
927252	AC1-221 E	1.4238	Adder	1.68
927261	AC1-222 C	3.4605	Adder	4.07
927262	AC1-222 E	3.2943	Adder	3.88
932761	AC2-100 C	3.2767	Adder	3.85
932762	AC2-100 E	1.5993	Adder	1.88
934311	AD1-055 C	2.4027	Adder	2.83
934312	AD1-055 E	0.6196	Adder	0.73
934341	AD1-058 C	3.5693	Adder	4.2
934342	AD1-058 E	0.9069	Adder	1.07

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934611	AD1-087 C O1	10.2518	Adder	12.06
934612	AD1-087 E O1	4.8182	Adder	5.67
934621	AD1-088 C	35.2809	50/50	35.2809
934622	AD1-088 E	16.6028	50/50	16.6028
934991	AD1-131 C	1.1702	Adder	1.38
934992	AD1-131 E	0.7802	Adder	0.92
935171	AD1-152 C O1	10.1882	Adder	11.99
935172	AD1-152 E O1	6.7921	Adder	7.99
935221	AD1-157 C	3.8766	50/50	3.8766
935222	AD1-157 E	2.5844	50/50	2.5844
936261	AD2-033 C	23.8134	50/50	23.8134
936262	AD2-033 E	15.8756	50/50	15.8756
936361	AD2-046 C O1	7.9908	Adder	9.4
936362	AD2-046 E O1	3.6746	Adder	4.32
936481	AD2-063 C O1	20.2480	Adder	23.82
936482	AD2-063 E O1	13.3862	Adder	15.75
937481	AD2-202 C O1	2.7168	Adder	3.2
937482	AD2-202 E O1	1.5282	Adder	1.8
938371	AE1-056 C	16.7123	50/50	16.7123
938372	AE1-056 E	9.1315	50/50	9.1315
938561	AE1-075 C	-0.9180	Adder	-1.08
939181	AE1-148 C O1	8.0077	Adder	9.42
939182	AE1-148 E O1	5.3385	Adder	6.28
940241	AE2-006	0.9345	50/50	0.9345
940661	AE2-053 O1	2.9658	Adder	3.49
941791	AE2-182 C	5.7319	50/50	5.7319
941792	AE2-182 E	2.6683	50/50	2.6683
942451	AE2-258	2.7399	Adder	3.22
942461	AE2-259 C O1	30.4860	50/50	30.4860
942462	AE2-259 E O1	20.3240	50/50	20.3240
942751	AE2-291 C O1	5.6749	Adder	6.68
942752	AE2-291 E O1	3.7832	Adder	4.45
942761	AE2-292 C O1	7.0658	Adder	8.31
942762	AE2-292 E O1	4.7105	Adder	5.54
943901	AF1-058 C	1.9505	Adder	2.29
943902	AF1-058 E	1.3004	Adder	1.53
943911	AF1-059	13.3280	Adder	15.68
945811	AF1-246 C O1	10.5336	Adder	12.39
945812	AF1-246 E O1	17.1135	50/50	17.1135
946293	AF1-293 BAT	11.0357	Merchant Transmission	11.0357
946301	AF1-294 C	9.9182	50/50	9.9182
946302	AF1-294 E	6.6122	50/50	6.6122
957481	AF2-042 C O2	88.5180	50/50	88.5180
957482	AF2-042 E O2	59.0120	50/50	59.0120
958211	AF2-115 C	6.0477	50/50	6.0477
958212	AF2-115 E	4.0318	50/50	4.0318
958503	AF2-144 BAT	0.4731	Merchant Transmission	0.4731
958801	AF2-171 C O2	36.7794	50/50	36.7794
958802	AF2-171 E O2	24.5196	50/50	24.5196
959311	AF2-222 C	33.3650	50/50	33.3650
959312	AF2-222 E	22.3545	50/50	22.3545
959751	AF2-266 O2	6.6462	Adder	14.75

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960061	AF2-297 C O2	4.4186	Adder	9.81
960062	AF2-297 E O2	2.9458	Adder	6.54
960811	AF2-372 C	0.7665	Adder	1.7
960812	AF2-372 E	1.2509	Adder	2.78
960821	AF2-373 C	0.5310	Adder	1.18
960822	AF2-373 E	0.7965	Adder	1.77
961063	AF2-397 BAT	4.1505	Merchant Transmission	4.1505
961081	AF2-399 C	0.7803	50/50	0.7803
961082	AF2-399 E	1.3193	50/50	1.3193
WEC	WEC	0.2996	Confirmed LTF	0.2996
LGEE	LGEE	0.5659	Confirmed LTF	0.5659
CPL	CPL	3.4980	Confirmed LTF	3.4980
CBM-W2	CBM-W2	12.4652	Confirmed LTF	12.4652
NY	NY	0.3893	Confirmed LTF	0.3893
CBM-W1	CBM-W1	11.1464	Confirmed LTF	11.1464
TVA	TVA	2.6530	Confirmed LTF	2.6530
O-066	O-066	5.4365	Confirmed LTF	5.4365
CBM-S2	CBM-S2	23.4841	Confirmed LTF	23.4841
CBM-S1	CBM-S1	14.7140	Confirmed LTF	14.7140
G-007	G-007	0.8476	Confirmed LTF	0.8476
MADISON	MADISON	0.7822	Confirmed LTF	0.7822
MEC	MEC	1.8448	Confirmed LTF	1.8448
AA2-074	AA2-074	2.3836	LTF	2.3836

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
149307949	314697	6SEEDGE HILL	DVP	927250	AC1-221 TAP	DVP	1	314906 8CLOVER 500 945810 AF1-246 TAP 500 1	single	674.92	110.74	111.06	DC	7.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1294	80/20	0.1294
314429	3JTRSVLE	0.5174	80/20	0.5174
314677	6BUCKING	0.4258	80/20	0.4258
315153	1CLOVER1	39.4381	80/20	39.4381
315154	1CLOVER2	39.0451	80/20	39.0451
315156	1HALLBR1	1.1309	80/20	1.1309
315158	1KERR 1	0.3659	80/20	0.3659
315159	1KERR 2	1.0244	80/20	1.0244
315160	1KERR 3	1.0244	80/20	1.0244
315161	1KERR 4	1.0244	80/20	1.0244
315162	1KERR 5	1.0244	80/20	1.0244
315163	1KERR 6	1.0244	80/20	1.0244
315164	1KERR 7	1.0244	80/20	1.0244
315191	1BEARGRDN G1	2.8787	80/20	2.8787
315192	1BEARGRDN G2	2.8787	80/20	2.8787
315193	1BEARGRDN S1	5.9246	80/20	5.9246
315266	1PLYWOOD A	3.3432	80/20	3.3432
920291	AA2-127	0.5980	80/20	0.5980
924021	AB2-043 C O1	0.7329	80/20	0.7329
924161	AB2-060 C OP	2.1135	80/20	2.1135
924301	AB2-077 C O1 (Suspended)	2.7328	80/20	2.7328
924311	AB2-078 C O1 (Suspended)	2.7328	80/20	2.7328
924321	AB2-079 C O1 (Suspended)	2.7328	80/20	2.7328
925611	AC1-036 C	1.3105	80/20	1.3105
925661	AC1-042 C	1.6067	80/20	1.6067
925781	AC1-054 C O1	5.0298	80/20	5.0298
925831	AC1-062	0.0768	80/20	0.0768
925991	AC1-075 C	11.9864	80/20	11.9864
926021	AC1-080 C	4.0059	80/20	4.0059
926271	AC1-105 C O1 (Suspended)	14.5305	80/20	14.5305
926641	AC1-145 C	1.9127	80/20	1.9127
927251	AC1-221 C	-2.4414	Adder	-2.87
927261	AC1-222 C	10.1431	80/20	10.1431
932511	AC2-071 C	2.4320	80/20	2.4320
934311	AD1-055 C	7.0426	80/20	7.0426

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934341	AD1-058 C	-6.1203	Adder	-7.2
934611	AD1-087 C O1	27.0094	80/20	27.0094
934621	AD1-088 C	24.0247	80/20	24.0247
935171	AD1-152 C O1	26.8416	80/20	26.8416
935221	AD1-157 C	2.1223	80/20	2.1223
936261	AD2-033 C	17.8675	80/20	17.8675
936361	AD2-046 C O1	8.4639	80/20	8.4639
936481	AD2-063 C O1	20.4093	80/20	20.4093
937481	AD2-202 C O1	7.1578	80/20	7.1578
938371	AE1-056 C	9.1494	80/20	9.1494
939181	AE1-148 C O1	8.5347	80/20	8.5347
939941	AE1-230 C	0.6161	Adder	0.72
940241	AE2-006	0.6667	80/20	0.6667
940661	AE2-053 O1	3.1610	80/20	3.1610
941791	AE2-182 C	3.9032	80/20	3.9032
941801	AE2-185 C	3.6241	80/20	3.6241
941821	AE2-187 C	3.6241	80/20	3.6241
942451	AE2-258	3.1698	80/20	3.1698
942461	AE2-259 C O1	14.4012	80/20	14.4012
942671	AE2-283 C	3.9865	80/20	3.9865
942751	AE2-291 C O1	15.7260	80/20	15.7260
942761	AE2-292 C O1	19.5804	80/20	19.5804
943901	AF1-058 C	5.7522	80/20	5.7522
943911	AF1-059	14.3780	80/20	14.3780
945081	AF1-173	1.4043	80/20	1.4043
946301	AF1-294 C	5.7653	80/20	5.7653
958211	AF2-115 C	3.5154	80/20	3.5154
958801	AF2-171 C O2	21.1149	80/20	21.1149
959311	AF2-222 C	23.0530	80/20	23.0530
960061	AF2-297 C O2	28.8259	80/20	28.8259
960811	AF2-372 C	1.7262	80/20	1.7262
960821	AF2-373 C	2.1290	80/20	2.1290
961061	AF2-397 C O2	3.2971	Adder	7.32
961081	AF2-399 C	0.4546	80/20	0.4546
961121	AF2-403	0.3628	Adder	0.81
NEWTON	NEWTON	1.6150	Confirmed LTF	1.6150
FARMERCITY	FARMERCITY	0.0953	Confirmed LTF	0.0953
G-007A	G-007A	0.4939	Confirmed LTF	0.4939
VFT	VFT	1.3094	Confirmed LTF	1.3094
CALDERWOOD	CALDERWOOD	1.4284	Confirmed LTF	1.4284
PRAIRIE	PRAIRIE	4.4893	Confirmed LTF	4.4893
AC1-131	AC1-131	5.1015	LTF	5.1015
CHEOAH	CHEOAH	1.4720	Confirmed LTF	1.4720
EDWARDS	EDWARDS	0.4816	Confirmed LTF	0.4816
TILTON	TILTON	0.8429	Confirmed LTF	0.8429
GIBSON	GIBSON	0.7671	Confirmed LTF	0.7671
BLUEG	BLUEG	2.3314	Confirmed LTF	2.3314
TRIMBLE	TRIMBLE	0.7379	Confirmed LTF	0.7379
CATAWBA	CATAWBA	1.6961	Confirmed LTF	1.6961

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
98161930	314747	6BREMO	DVP	313867	6BREMODIST	DVP	1	314333 6POWHATN 230 933500 AC2-165 TAP 230 1	single	661.76	126.21	128.06	DC	12.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1491	80/20	0.1491
314429	3JTRSVLE	0.5962	80/20	0.5962
314572	3EMPORIA	0.0240	80/20	0.0240
314677	6BUCKING	1.1738	80/20	1.1738
314704	3LAWRENC	0.1552	80/20	0.1552
315153	1CLOVER1	8.0124	80/20	8.0124
315154	1CLOVER2	7.9325	80/20	7.9325
315158	1KERR 1	0.2616	80/20	0.2616
315159	1KERR 2	0.7325	80/20	0.7325
315160	1KERR 3	0.7325	80/20	0.7325
315161	1KERR 4	0.7325	80/20	0.7325
315162	1KERR 5	0.7325	80/20	0.7325
315163	1KERR 6	0.7325	80/20	0.7325
315164	1KERR 7	0.7325	80/20	0.7325
315191	1BEARGRDN G1	16.5646	80/20	16.5646
315192	1BEARGRDN G2	16.5646	80/20	16.5646
315193	1BEARGRDN S1	34.0910	80/20	34.0910
315266	1PLYWOOD A	0.7353	80/20	0.7353
920291	AA2-127	3.4412	80/20	3.4412
923572	AB1-173 C OP	0.7332	80/20	0.7332
923582	AB1-173AC OP	0.7332	80/20	0.7332
923911	AB2-031 C O1	0.7278	80/20	0.7278
923991	AB2-040 C O1	2.3896	80/20	2.3896
924021	AB2-043 C O1	0.4676	80/20	0.4676
924161	AB2-060 C OP	1.3842	80/20	1.3842
924301	AB2-077 C O1 (Suspended)	1.6795	80/20	1.6795
924311	AB2-078 C O1 (Suspended)	1.6795	80/20	1.6795
924321	AB2-079 C O1 (Suspended)	1.6795	80/20	1.6795
925171	AB2-174 C O1	0.3972	80/20	0.3972
925611	AC1-036 C	1.2045	80/20	1.2045
925781	AC1-054 C O1	3.9503	80/20	3.9503
925831	AC1-062	0.0885	80/20	0.0885
925991	AC1-075 C	2.3895	80/20	2.3895
926021	AC1-080 C	0.7986	80/20	0.7986
926271	AC1-105 C O1 (Suspended)	3.3692	80/20	3.3692
926451	AC1-116 C	-0.7531	Adder	-0.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
927251	AC1-221 C	0.7912	80/20	0.7912
927261	AC1-222 C	1.8753	80/20	1.8753
932511	AC2-071 C	6.7040	80/20	6.7040
932761	AC2-100 C	1.8208	80/20	1.8208
933501	AC2-165 C	35.3138	80/20	35.3138
934311	AD1-055 C	1.3021	80/20	1.3021
934341	AD1-058 C	1.9834	80/20	1.9834
934611	AD1-087 C O1	4.5455	80/20	4.5455
934621	AD1-088 C	21.9177	80/20	21.9177
934991	AD1-131 C	0.6503	80/20	0.6503
935171	AD1-152 C O1	4.5173	80/20	4.5173
935221	AD1-157 C	2.6102	80/20	2.6102
936261	AD2-033 C	15.5243	80/20	15.5243
936361	AD2-046 C O1	5.9036	80/20	5.9036
936481	AD2-063 C O1	15.2622	80/20	15.2622
937481	AD2-202 C O1	1.2046	80/20	1.2046
938371	AE1-056 C	11.2528	80/20	11.2528
938821	AE1-108 C	11.6026	80/20	11.6026
939181	AE1-148 C O1	5.9157	80/20	5.9157
940241	AE2-006	0.6128	80/20	0.6128
940661	AE2-053 O1	2.1910	80/20	2.1910
941791	AE2-182 C	3.5609	80/20	3.5609
942451	AE2-258	2.0222	80/20	2.0222
942461	AE2-259 C O1	20.7678	80/20	20.7678
942751	AE2-291 C O1	3.3042	80/20	3.3042
942761	AE2-292 C O1	4.1140	80/20	4.1140
943901	AF1-058 C	1.0482	80/20	1.0482
943911	AF1-059	10.4370	80/20	10.4370
945811	AF1-246 C O1	3.5725	80/20	3.5725
946281	AF1-292 C	0.4998	80/20	0.4998
946291	AF1-293 C O1	6.7728	80/20	6.7728
946301	AF1-294 C	6.6427	80/20	6.6427
946591	AF1-323 C	3.7326	80/20	3.7326
957481	AF2-042 C O2	25.5180	80/20	25.5180
958131	AF2-107 C	2.0323	80/20	2.0323
958211	AF2-115 C	4.0505	80/20	4.0505
958801	AF2-171 C O2	24.6609	80/20	24.6609
959311	AF2-222 C	21.9610	80/20	21.9610
959751	AF2-266 O2	4.2530	80/20	4.2530
960061	AF2-297 C O2	3.9840	80/20	3.9840
960081	AF2-299 C	0.8424	80/20	0.8424
960111	AF2-302 C	1.3573	80/20	1.3573
960811	AF2-372 C	1.0609	80/20	1.0609
960821	AF2-373 C	0.6309	80/20	0.6309
961061	AF2-397 C O2	12.2920	80/20	12.2920
961081	AF2-399 C	0.5225	80/20	0.5225
WEC	WEC	0.0636	Confirmed LTF	0.0636
LGEE	LGEE	0.1278	Confirmed LTF	0.1278
CPL	CPL	2.2326	Confirmed LTF	2.2326
CBM-W2	CBM-W2	5.0614	Confirmed LTF	5.0614
NY	NY	0.4015	Confirmed LTF	0.4015
CBM-W1	CBM-W1	2.0391	Confirmed LTF	2.0391

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>TVA</b>	TVA	1.2404	Confirmed LTF	1.2404
<b>CBM-S2</b>	CBM-S2	14.2882	Confirmed LTF	14.2882
<b>CBM-S1</b>	CBM-S1	6.5008	Confirmed LTF	6.5008
<b>MADISON</b>	MADISON	0.5786	Confirmed LTF	0.5786
<b>MEC</b>	MEC	0.5641	Confirmed LTF	0.5641
<b>AA2-074</b>	AA2-074	1.5188	LTF	1.5188

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
98161883	314765	6MTEAGLE	DVP	314749	6CHARLVL	DVP	1	314333 6POWHATN 230 933500 AC2-165 TAP 230 1	single	661.76	119.6	125.37	DC	38.18

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313853	3PONTONDP	0.1363	80/20	0.1363
314429	3JTRSVLE	0.5452	80/20	0.5452
314572	3EMPORIA	0.0219	80/20	0.0219
314677	6BUCKING	1.0694	80/20	1.0694
314704	3LAWRENC	0.1423	80/20	0.1423
315153	1CLOVER1	7.3430	80/20	7.3430
315154	1CLOVER2	7.2698	80/20	7.2698
315158	1KERR 1	0.2422	80/20	0.2422
315159	1KERR 2	0.6782	80/20	0.6782
315160	1KERR 3	0.6782	80/20	0.6782
315161	1KERR 4	0.6782	80/20	0.6782
315162	1KERR 5	0.6782	80/20	0.6782
315163	1KERR 6	0.6782	80/20	0.6782
315164	1KERR 7	0.6782	80/20	0.6782
315191	1BEARGRDN G1	15.0842	80/20	15.0842
315192	1BEARGRDN G2	15.0842	80/20	15.0842
315193	1BEARGRDN S1	31.0443	80/20	31.0443
315266	1PLYWOOD A	0.6953	80/20	0.6953
920291	AA2-127	3.1336	80/20	3.1336
924021	AB2-043 C O1	0.4312	80/20	0.4312
924161	AB2-060 C OP	1.2758	80/20	1.2758
924301	AB2-077 C O1 (Suspended)	1.5499	80/20	1.5499
924311	AB2-078 C O1 (Suspended)	1.5499	80/20	1.5499
924321	AB2-079 C O1 (Suspended)	1.5499	80/20	1.5499
925171	AB2-174 C O1	0.3622	80/20	0.3622
925611	AC1-036 C	1.1045	80/20	1.1045
925781	AC1-054 C O1	3.6512	80/20	3.6512
925831	AC1-062	0.0809	80/20	0.0809
925991	AC1-075 C	2.5684	80/20	2.5684
926021	AC1-080 C	0.8584	80/20	0.8584
926271	AC1-105 C O1 (Suspended)	3.1786	80/20	3.1786
926451	AC1-116 C	3.6384	80/20	3.6384
927251	AC1-221 C	0.7555	80/20	0.7555
927261	AC1-222 C	1.8244	80/20	1.8244
932511	AC2-071 C	6.1076	80/20	6.1076
932761	AC2-100 C	1.7388	80/20	1.7388

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
933501	AC2-165 C	32.1571	80/20	32.1571
934311	AD1-055 C	1.2668	80/20	1.2668
934341	AD1-058 C	1.8940	80/20	1.8940
934611	AD1-087 C O1	4.2050	80/20	4.2050
934621	AD1-088 C	19.9913	80/20	19.9913
934991	AD1-131 C	0.6210	80/20	0.6210
935171	AD1-152 C O1	4.1789	80/20	4.1789
935221	AD1-157 C	2.3854	80/20	2.3854
936261	AD2-033 C	14.2459	80/20	14.2459
936361	AD2-046 C O1	5.4614	80/20	5.4614
936481	AD2-063 C O1	14.0364	80/20	14.0364
937481	AD2-202 C O1	1.1144	80/20	1.1144
938371	AE1-056 C	10.2839	80/20	10.2839
938821	AE1-108 C	35.7983	80/20	35.7983
939181	AE1-148 C O1	5.4713	80/20	5.4713
940241	AE2-006	0.5619	80/20	0.5619
940661	AE2-053 O1	2.0264	80/20	2.0264
941011	AE2-092 C	29.1911	80/20	29.1911
941791	AE2-182 C	3.2479	80/20	3.2479
942451	AE2-258	1.8649	80/20	1.8649
942461	AE2-259 C O1	18.9528	80/20	18.9528
942751	AE2-291 C O1	3.7718	80/20	3.7718
942761	AE2-292 C O1	4.6962	80/20	4.6962
943901	AF1-058 C	0.9984	80/20	0.9984
943911	AF1-059	9.5960	80/20	9.5960
945811	AF1-246 C O1	3.2617	80/20	3.2617
946281	AF1-292 C	0.4551	80/20	0.4551
946291	AF1-293 C O1	47.0478	80/20	47.0478
946301	AF1-294 C	6.0747	80/20	6.0747
946591	AF1-323 C	11.4715	80/20	11.4715
957481	AF2-042 C O2	23.2980	80/20	23.2980
958131	AF2-107 C	6.0592	80/20	6.0592
958211	AF2-115 C	3.7041	80/20	3.7041
958801	AF2-171 C O2	22.5495	80/20	22.5495
959311	AF2-222 C	20.1270	80/20	20.1270
959751	AF2-266 O2	3.8830	80/20	3.8830
960061	AF2-297 C O2	3.7296	80/20	3.7296
960081	AF2-299 C	0.7671	80/20	0.7671
960111	AF2-302 C	4.1714	80/20	4.1714
960811	AF2-372 C	0.9790	80/20	0.9790
960821	AF2-373 C	0.5906	80/20	0.5906
961061	AF2-397 C O2	38.1787	80/20	38.1787
961081	AF2-399 C	0.4779	80/20	0.4779
WEC	WEC	0.1254	Confirmed LTF	0.1254
LGEE	LGEE	0.2482	Confirmed LTF	0.2482
CPL	CPL	2.1704	Confirmed LTF	2.1704
CBM-W2	CBM-W2	6.5766	Confirmed LTF	6.5766
NY	NY	0.4302	Confirmed LTF	0.4302
CBM-W1	CBM-W1	4.4035	Confirmed LTF	4.4035
TVA	TVA	1.4980	Confirmed LTF	1.4980
CBM-S2	CBM-S2	14.4558	Confirmed LTF	14.4558
CBM-S1	CBM-S1	8.1110	Confirmed LTF	8.1110

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>MADISON</b>	MADISON	0.5443	Confirmed LTF	0.5443
<b>MEC</b>	MEC	0.8692	Confirmed LTF	0.8692
<b>AA2-074</b>	AA2-074	1.4778	LTF	1.4778

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
95969460	946590	AF1-323 TAP	AEP	242613	05COLLEEN SS	AEP	1	DVP_P4-2: 422	breaker	167.0	109.48	182.14	DC	121.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938821	AE1-108 C	85.6797	50/50	85.6797
938822	AE1-108 E	57.1198	50/50	57.1198
946591	AF1-323 C	30.8590	50/50	30.8590
946592	AF1-323 E	20.5726	50/50	20.5726
960111	AF2-302 C	11.2214	50/50	11.2214
960112	AF2-302 E	7.4810	50/50	7.4810
961061	AF2-397 C O2	72.7997	50/50	72.7997
961062	AF2-397 E O2	48.5332	50/50	48.5332
CPLE	CPLE	0.0007	Confirmed LTF	0.0007

### 13.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
<b>DVP_P1-2: LN 556-A</b>	CONTINGENCY 'DVP_P1-2: LN 556-A' 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 945810 CKT 1 /* 8CLOVER 500.00 - AF1- 246 TAP 500.00 OPEN BUS 314906 /* ISLAND: 8CLOVER 500.00 OPEN BUS 314915 /* ISLAND: 8CLOVER_STC 500.00 END
<b>DVP_P1-2: LN 556-B</b>	CONTINGENCY 'DVP_P1-2: LN 556-B' OPEN BRANCH FROM BUS 945810 TO BUS 314936 CKT 1 /* AF1-246 TAP 500.00 - 8RAWLINGS 500.00 END
<b>DVP_P4-2: 511T556</b>	CONTINGENCY 'DVP_P4-2: 511T556' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 940470 TO BUS 314936 CKT 1 /* AE2-031 TAP 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 945810 TO BUS 314936 CKT 1 /* AF1-246 TAP 500.00 - 8RAWLINGS 500.00 END
<b>DVP_P2-2: BREMO B4</b>	CONTINGENCY 'DVP_P2-2: BREMO B4' /* BREMO 115 KV OPEN BRANCH FROM BUS 313871 TO BUS 313874 CKT 1 /* 3COBBS CREEK115.00 - 3JAMES RI TP115.00 OPEN BRANCH FROM BUS 313871 TO BUS 314762 CKT 1 /* 3COBBS CREEK115.00 - 3JAMES R 115.00 OPEN BRANCH FROM BUS 313874 TO BUS 313875 CKT 1 /* 3JAMES RI TP115.00 - 3TRICESLK 115.00 OPEN BRANCH FROM BUS 313874 TO BUS 314744 CKT 1 /* 3JAMES RI TP115.00 - 3BREMO 115.00 OPEN BUS 313871 /* ISLAND: 3COBBS CREEK115.00 OPEN BUS 313874 /* ISLAND: 3JAMES RI TP115.00 OPEN BUS 313875 /* ISLAND: 3TRICESLK 115.00 OPEN BUS 314762 /* ISLAND: 3JAMES R 115.00 OPEN BRANCH FROM BUS 313708 TO BUS 314744 CKT 1 /* 3FORK UNION 115.00 - 3BREMO 115.00 OPEN BRANCH FROM BUS 314744 TO BUS 314747 CKT 1 /* 3BREMO 115.00 - 6BREMO 230.00 END

Contingency Name	Contingency Definition
DVP_P4-2: 556T591	CONTINGENCY 'DVP_P4-2: 556T591' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 945810 TO BUS 314936 CKT 1 /* AF1-246 TAP 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 314935 TO BUS 314936 CKT 1 /* 8HERITAGE 500.00 - 8RAWLINGS 500.00 END
314906 8CLOVER 500 945810 AF1-246 TAP 500 1	CONTINGENCY '314906 8CLOVER 500 945810 AF1-246 TAP 500 1' OPEN BRANCH FROM BUS 314906 TO BUS 945810 CKT 1 END
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 OPEN BUS 923862 /* ISLAND: AB2-026 E 230.00 END
DVP_P4-2: 422	CONTINGENCY 'DVP_P4-2: 422' /* BREMO 115 KV OPEN BRANCH FROM BUS 313871 TO BUS 313874 CKT 1 /* 3COBBS CREEK115.00 - 3JAMES RI TP115.00 OPEN BRANCH FROM BUS 313871 TO BUS 314762 CKT 1 /* 3COBBS CREEK115.00 - 3JAMES R 115.00 OPEN BRANCH FROM BUS 313874 TO BUS 313875 CKT 1 /* 3JAMES RI TP115.00 - 3TRICESLK 115.00 OPEN BRANCH FROM BUS 313874 TO BUS 314744 CKT 1 /* 3JAMES RI TP115.00 - 3BREMO 115.00 OPEN BUS 313871 /* ISLAND: 3COBBS CREEK115.00 OPEN BUS 313874 /* ISLAND: 3JAMES RI TP115.00 OPEN BUS 313875 /* ISLAND: 3TRICESLK 115.00 OPEN BUS 314762 /* ISLAND: 3JAMES R 115.00 OPEN BRANCH FROM BUS 313708 TO BUS 314744 CKT 1 /* 3FORK UNION 115.00 - 3BREMO 115.00 OPEN BRANCH FROM BUS 314744 TO BUS 314747 CKT 1 /* 3BREMO 115.00 - 6BREMO 230.00 END
Base Case	

Contingency Name	Contingency Definition
<b>DVP_P1-2: LN 2028</b>	CONTINGENCY 'DVP_P1-2: LN 2028' OPEN BRANCH FROM BUS 313707 TO BUS 314765 CKT 1 /* 6FORK UNION 230.00 - 6MTEAGLE 230.00 OPEN BRANCH FROM BUS 314749 TO BUS 314765 CKT 1 /* 6CHARLVL 230.00 - 6MTEAGLE 230.00 OPEN BUS 314765 /* ISLAND: 6MTEAGLE 230.00 OPEN BUS 926451 /* ISLAND: AC1-116 C 230.00 OPEN BUS 926452 /* ISLAND: AC1-116 E 230.00 END
<b>DVP_P4-2: 511T591</b>	CONTINGENCY 'DVP_P4-2: 511T591' /* RAWLINGS 500 KV OPEN BRANCH FROM BUS 940470 TO BUS 314936 CKT 1 /* AE2-031 TAP 500.00 - 8RAWLINGS 500.00 OPEN BRANCH FROM BUS 314935 TO BUS 314936 CKT 1 /* 8HERITAGE 500.00 - 8RAWLINGS 500.00 END
<b>314333 6POWHATN 230 933500 AC2-165 TAP 230 1</b>	CONTINGENCY '314333 6POWHATN 230 933500 AC2-165 TAP 230 1' OPEN BRANCH FROM BUS 314333 TO BUS 933500 CKT 1 END

## **14 Affected Systems**

### **14.1 TVA**

TVA Impacts to be determined during later study phases (as applicable).

### **14.2 Duke Energy Progress**

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

## Attachment 1: One Line Diagram