



**Generation Interconnection
Feasibility Study Report
for
Queue Project AG1-316
RUSTBURG 138 KV
64 MW Capacity / 80 MW Energy**

January 2021

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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 AEP.

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.

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 Campbell County, Virginia. The installed facilities will have a total capability of 80 MW with 64 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 30, 2024. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-316
Project Name	RUSTBURG 138 KV
State	Virginia
County	Campbell
Transmission Owner	AEP
MFO	80
MWE	80
MWC	64
Fuel	Solar; Storage
Basecase Study Year	2024

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 – Primary POI

AG1-316 will interconnect with the AEP transmission system at the Rustburg 138 kV substation.

To accommodate the interconnection to the Rustburg 138 kV substation, three (3) new 138 kV circuit breakers will be installed (see Attachment 1). Installation of associated protection and control equipment, 138 kV line risers, SCADA, and 138 kV revenue metering will also be required. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.

Installation of the generator lead first span exiting the POI station, including the first structure outside the AEP fence, will also be included in AEP's scope. In the case where the generator lead is a single span, the structure in the customer station will be the customer's responsibility.

5 Point of Interconnection – Secondary POI

AG1-316 will interconnect with the AEP transmission system via a direct connection to the Sherwill 69 kV substation.

To accommodate the interconnection to the Sherwill 69 kV substation, three (3) new 69 kV circuit breakers will be installed (see Attachment 2). Installation of associated protection and control equipment, 69 kV line risers, SCADA, and 69 kV revenue metering will also be required. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.

Installation of the generator lead first span exiting the POI station, including the first structure outside the AEP fence, will also be included in AEP's scope. In the case where the generator lead is a single span, the structure in the customer station will be the customer's responsibility.

6 Cost Summary

The AG1-316 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$9,016,000
Total System Network Upgrade Costs	\$97,387,400
Total Costs	\$106,403,400

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 2016-36, 2016-25 I.R.B. (6/20/2016). 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.

7 Transmission Owner Scope of Work

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

7.1 Attachment Facilities

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

Description	Total Cost
138 kV Revenue Metering	\$376,000
Generator lead first span exiting the POI station, including the first structure outside the fence	\$400,000
Total Attachment Facility Costs	\$776,000

7.2 Direct Connection Cost Estimate

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

Description	Total Cost
Three (3) new 138 kV circuit breakers will be installed at the expanded Rustburg 138 kV substation (Figure 1). Installation of associated protection and control equipment, 138 kV line risers, and SCADA will also be required.	\$8,150,000
Total Direct Connection Facility Costs	\$8,150,000

7.3 Non-Direct Connection Cost Estimate

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

Description	Total Cost
Review line protection and control settings at the Chandlers Mountain 138 kV substation	\$45,000
Review line protection and control settings at the Rustburg 138 kV substation	\$45,000
Total Non-Direct Connection Facility Costs	\$90,000

8 Transmission Owner Analysis

AEP conducted load flow analysis and identify the overloads below for the Sub-Transmission:

- 05Sherwill - 05Long Mountain SS 69kV line
 - Loading before AG1-316: 7%
 - Loading after AG1-316: 107%
- 05Long Mountain SS 69kV - 05B&W 69kV line
 - Loading before AG1-316: 13%
 - Loading after AG1-316: 103%

A more detailed load flow and short circuit analysis will be conducted for the Sub-Transmission System in the System Impact study phase.

9 Schedule

It is anticipated that the time between receipt of executed Agreements and Commercial Operation may range from 12 to 18 months if no line work is required. If line work is required, construction time would generally be between 24 to 36 months after Agreement execution.

10 Interconnection Customer Requirements

It is understood that the Interconnection Customer (IC) is responsible for all costs associated with this interconnection. The costs above are reimbursable to the Transmission Owner. The cost of the IC's generating plant and the costs for the line connecting the generating plant to the Point of Interconnection are not included in this report; these are assumed to be the IC's responsibility.

The Generation Interconnection Agreement does not in or by itself establish a requirement for the Transmission Owner to provide power for consumption at the developer's facilities. A separate agreement may be reached with the local utility that provides service in the area to ensure that infrastructure is in place to meet this demand and proper metering equipment is installed. It is the responsibility of the developer to contact the local service provider to determine if a local service agreement is required.

1. An Interconnection Customer entering the New Services Queue on or after October 1, 2012 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.
2. The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.

11 Revenue Metering and SCADA Requirements

11.1 PJM Requirements

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

11.2 Meteorological Data Reporting Requirements

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

- Back Panel temperature (Fahrenheit) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter²) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) - (Accepted, not required)
- Wind direction (decimal degrees from true north) - (Accepted, not required)

11.3 Interconnected Transmission Owner Requirements

The IC will be required to comply with all Interconnected Transmission Owner's revenue metering requirements for generation interconnection customers located at the following link:

<http://www.pjm.com/planning/design-engineering/to-tech-standards/>

12 Summer Peak - Load Flow Analysis - Primary POI

The Queue Project AG1-316 was evaluated as a 80.0 MW (Capacity 64.0 MW) injection at the Rustburg 138 kV substation in the AEP area. Project AG1-316 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-316 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

12.1 Generation Deliverability

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
167931903	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P1-2_#5419_105	single	296.0	98.01	100.61	DC	7.7

12.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
161696819	242575	05CAMDLM	138.0	AEP	242737	05OPOSSUMCK	138.0	AEP	1	AEP_P2-2_#10292_05NEWLDN 138_1	bus	284.0	91.31	113.07	DC	61.8
161696850	946590	AF1-323 TAP	138.0	AEP	242792	05SCOTSV	138.0	AEP	1	DVP_P2-2: BREMOB1	bus	167.0	99.5	100.62	DC	4.15

12.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
167931902	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P2-1_242720 05MONETA 138 242775 05ROCKCASS 138 1	single	296.0	102.59	105.19	DC	7.7
161696698	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P2-2_#13260_05SKIMMR 69.0_1	bus	240.0	148.66	149.34	DC	3.06
161696700	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P2-2_#6213_05WLAKEL 138_1	bus	240.0	143.17	143.71	DC	2.45
161697066	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P7-1_#10830	tower	240.0	143.08	143.63	DC	2.45
161697067	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P7-1_#10829	tower	240.0	135.97	136.55	DC	2.64
167382269	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P4_#2914_05J.FERR	breaker	240.0	138.41	139.12	DC	3.21
167382270	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P4_#311_05CL OVRD	breaker	240.0	138.41	139.12	DC	3.21
161696693	242741	05OTTER	138.0	AEP	242687	05JOHNMT	138.0	AEP	1	AEP_P2-2_#13260_05SKIMMR 69.0_1	bus	245.0	149.16	149.82	DC	3.06
161696695	242741	05OTTER	138.0	AEP	242687	05JOHNMT	138.0	AEP	1	AEP_P2-2_#6213_05WLAKEL 138_1	bus	245.0	142.93	143.46	DC	2.45
161697076	242741	05OTTER	138.0	AEP	242687	05JOHNMT	138.0	AEP	1	AEP_P7-1_#10830	tower	245.0	142.81	143.34	DC	2.45
161697077	242741	05OTTER	138.0	AEP	242687	05JOHNMT	138.0	AEP	1	AEP_P7-1_#10829	tower	245.0	135.87	136.45	DC	2.64
167382277	242741	05OTTER	138.0	AEP	242687	05JOHNMT	138.0	AEP	1	AEP_P4_#2914_05J.FERR	breaker	245.0	136.08	136.78	DC	3.21

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 DC	MW IMPACT
167382278	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	AEP_P4_#311_05CL OVRD	breaker	245.0	136.08	136.78	DC	3.21
163718006	314667	4ALTVSTA	138.0	DVP	242741	05OTTER	138.0	AEP	1	AEP_P2-1_242575 05CAMDLM 138 242737 05OPOSSUMCK 138 1	single	245.0	119.19	122.7	DC	8.58
164061289	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	DVP_P2-2: BREMO B1	bus	228.0	104.59	105.41	DC	4.15
166950248	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	DVP_P7-1: LN 2106-2111	tower	228.0	106.83	107.74	DC	4.61
166950249	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	DVP_P7-1: LN 555-2168-A	tower	228.0	100.45	101.39	DC	4.74
161696809	926520	AC1-123 TAP	138.0	AEP	242575	05CAMDLM	138.0	AEP	1	AEP_P2-2_#10292_05NEWLD N 138_1	bus	255.0	110.6	114.17	DC	9.1
164061199	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P2-2: BREMO B1	bus	173.0	137.84	138.92	DC	4.15
164061200	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P2-2: DOOMS B2	bus	173.0	128.83	130.02	DC	4.57
166950175	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P7-1: LN 2106-2111	tower	173.0	140.8	142.0	DC	4.61
166950176	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P7-1: LN 555-2168-A	tower	173.0	132.39	133.63	DC	4.74
167139953	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	AP-P2-3-PE-500-014	breaker	173.0	128.2	129.41	DC	4.62
167139954	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	AP-P2-3-PE-500-015	breaker	173.0	128.2	129.41	DC	4.62

12.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
167931899	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P2-1_242720 05MONETA 138 242775 05ROCKCAS SS 138 1	operation	296.0	144.61	147.88	DC	9.62
167931901	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	Base Case	operation	296.0	116.17	117.36	DC	7.73
167932137	242550	05BEARSK	138.0	AEP	940080	AE1-250 TAP	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operation	392.0	105.82	108.28	DC	9.62

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADI NG %	POST PROJE CT LOADI NG %	AC DC	MW IMPA CT
168186376	242575	05CAMDLM	138.0	AEP	242737	05OPOSSUMCK	138.0	AEP	1	Base Case	operati on	205.0	88.6	119.36	DC	63.06
168186377	242575	05CAMDLM	138.0	AEP	242737	05OPOSSUMCK	138.0	AEP	1	DVP_P1-2: LN 104	operati on	284.0	90.51	112.58	DC	62.7
168186409	242632	05EDAN 2	138.0	AEP	242631	05EDAN 1	138.0	AEP	Z1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operati on	296.0	107.82	108.66	DC	5.47
168186179	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	Base Case	operati on	167.0	180.06	180.91	DC	2.69
168186181	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	AEP_P1-2_#3174_6	operati on	240.0	125.49	128.29	DC	6.72
163718177	242701	05LEESVI	138.0	AEP	314667	4ALTVSTA	138.0	DVP	1	AEP_P2-1_242575 05CAMDLM 138 242737 05OPOSSU MCK 138 1	operati on	284.0	114.0	121.07	DC	20.08
168186472	242720	05MONETA	138.0	AEP	243892	05MEADS8	138.0	AEP	1	AEP_P1-2_#5366_4 2-A	operati on	409.0	100.68	102.86	DC	8.85
168186313	242734	05NEWLDN	138.0	AEP	242569	05BRUSHT	138.0	AEP	1	AEP_P2-1_242641 05FOREST 138 242734 05NEWLDN 138 1	operati on	207.0	116.72	117.44	DC	2.83
168186171	242741	05OTTER	138.0	AEP	242687	05JOHNMT	138.0	AEP	1	Base Case	operati on	167.0	188.08	188.93	DC	2.69
168186434	242775	05ROCKCASS	138.0	AEP	242720	05MONETA	138.0	AEP	1	AEP_P2-1_242549 05BANSTR 138 940080 AE1-250 TAP 138 1-A	operati on	409.0	104.62	106.79	DC	8.85
168186435	242775	05ROCKCASS	138.0	AEP	242720	05MONETA	138.0	AEP	1	AEP_P1-2_#5366_4 2-A	operati on	409.0	104.62	106.79	DC	8.85
168186327	242802	05SMITHMTN	138.0	AEP	926050	AC1-083 TAP	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operati on	296.0	119.83	123.09	DC	9.62
168186337	242802	05SMITHMTN	138.0	AEP	242701	05LEESVI	138.0	AEP	1	AEP_P2-1_242575 05CAMDLM 138 242737 05OPOSSU MCK 138 1	operati on	255.0	110.76	118.64	DC	20.11
168186484	242802	05SMITHMTN	138.0	AEP	242775	05ROCKCASS	138.0	AEP	1	AEP_P1-2_#5366_4 2-A	operati on	409.0	99.33	101.5	DC	8.85
168186369	243892	05MEADS8	138.0	AEP	242607	05CLOVRD	138.0	AEP	1	AEP_P1-2_#5366_4 2-A	operati on	407.0	113.79	115.97	DC	8.85
168186371	243892	05MEADS8	138.0	AEP	242607	05CLOVRD	138.0	AEP	1	Base Case	operati on	348.0	100.21	101.03	DC	6.34
163717999	314667	4ALTVSTA	138.0	DVP	242741	05OTTER	138.0	AEP	1	Base Case	operati on	167.0	189.99	190.84	DC	2.69
169415331	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	Base Case	operati on	186.119995117	115.64	116.76	DC	4.62

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 PROJE CT LOADING %	POST PROJE CT LOADING %	AC/DC	MW IMPACT
167931926	926050	AC1-083 TAP	138.0	AEP	242550	05BEARSK	138.0	AEP	1	AEP_P2-1_24260705CLOVRD138 24389205MEADS8138 1	operation	296.0	140.17	143.43	DC	9.62
167931928	926050	AC1-083 TAP	138.0	AEP	242550	05BEARSK	138.0	AEP	1	Base Case	operation	296.0	109.08	110.26	DC	7.73
169682442	926520	AC1-123 TAP	138.0	AEP	242575	05CAMDLM	138.0	AEP	1	AEP_P2-1_24260705CLOVRD138 24389205MEADS8138 1	operation	255.0	111.55	114.61	DC	7.79
169682444	926520	AC1-123 TAP	138.0	AEP	242575	05CAMDLM	138.0	AEP	1	Base Case	operation	205.0	99.68	103.8	DC	8.47
169415220	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	Base Case	operation	156.979995728	137.11	138.43	DC	4.62
169682397	940080	AE1-250 TAP	138.0	AEP	242549	05BANSTR	138.0	AEP	1	AEP_P2-1_24260705CLOVRD138 24389205MEADS8138 1	operation	392.0	116.43	118.9	DC	9.62
169682399	940080	AE1-250 TAP	138.0	AEP	242549	05BANSTR	138.0	AEP	1	Base Case	operation	335.0	105.1	106.14	DC	7.73

12.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
163718006	6	4ALTVSTA 138.0 kV - 05OTTER 138.0 kV Ckt 1	<u>AEP</u> AEPA0014a (77) : Rebuild / reconductor 0.9 miles of overhead conductor (ACSR ~ 397.5 ~ 30/7 ~ LARK) Project Type : FAC Cost : \$1,350,000 Time Estimate : 24-36 Months <u>AEP</u> AEPA0014b (78) : Replace 795 AAC station conductors at Altavista Project Type : FAC Cost : \$100,000 Time Estimate : 12-18 Months <u>DVP</u> dom-001 (1501) : Relay Change Outs (Secondary) at Altavista Substation Project Type : FAC Cost : \$120,000 Time Estimate : 6-12 Months	\$1,570,000
164061289,166950248,166950249	7	4BREMO 138.0 kV - 3BREMO 115.0 kV Ckt 1	<u>DVP</u> dom-362 (1920) : Add an additional 138/115 kV transformer at Bremo Project Type : CON Cost : \$7,000,000 Time Estimate : 16-18 Months	\$7,000,000
161696693,161697076,161697077,161696695,167382278,167382277	5	05OTTER 138.0 kV - 05JOHNMT 138.0 kV Ckt 1	<u>AEP</u> AEPA0019a (91) : 2) Rebuild/reconductor JohnMt - Otter Line, ACSR ~ 397.5 ~ 30/7 ~ LARK Conductor Section 1, 7 Miles. \$10.5M Project Type : FAC Cost : \$10,500,000 Time Estimate : 24-36 Months <u>AEP</u> AEPA0019b (92) : Replace 795 AAC station conductors at Otter Project Type : FAC Cost : \$10,670,000 Time Estimate : 18-24 Months <u>AEP</u> AEPA0019c (93) : Replace 1200 A Switch at Otter Project Type : FAC Cost : \$100,000 Time Estimate : 12-18 Months	\$21,270,000

ID	Idx	Facility	Upgrade Description	Cost
167931903,167931902	1	05BANSTR 138.0 kV - 05EDAN 2 138.0 kV Ckt 1	<u>AEP</u> AEPA0010e (65) : A Sag Study will be required for the 10.7 miles of overhead conductor (2 bundle ACSR ~ 556.5 ~ 26/7 ~ DOVE) to mitigate the overload. Depending on the sag study results, the cost for this upgrade is expected to be between \$42,800 (no remediation required, just sag study) and \$21.4 million (complete line reconductor/rebuild). New Rating after sag study is SN 298MVA, SE:396MVA. Time Estimate: a) Sag Study: 6-12 months b) Rebuild: The standard time required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement. Project Type : FAC Cost : \$42,800 Time Estimate : 6-12 Months	\$42,800
164061199,164061200,166950176,166950175,167139953,167139954	9	AE1-108 TAP 138.0 kV - 4BREMO 138.0 kV Ckt 1	<u>DVP</u> dom-397 (1955) : Reconductor 8.502 miles of 138 kV line 8 from AE1-108 Tap to Brema with 636 ACSR 150 C Project Type : FAC Cost : \$5,101,200 Time Estimate : 30-36 Months	\$5,101,200
161696698,161697067,161697066,161696700,167382269,167382270	4	05JOHNMT 138.0 kV - 05NEWLDN 138.0 kV Ckt 1	<u>AEP</u> AEPA0020a (94) : Current Station Rating: S/N: 167, S/E: 240 1) Rebuild/reconductor ACSR ~ 397.5 ~ 30/7 ~ LARK ~ Fe Clamps 9 d, Conductor Section 1, 14.43 miles Project Type : FAC Cost : \$21,650,000 Time Estimate : 12-18 Months <u>AEP</u> AEPA0020b (95) : Replace 1200 A Wavetrap at New London Project Type : FAC Cost : \$50,000 Time Estimate : 24-36 Months	\$21,700,000
161696819	2	05CAMDLM 138.0 kV - 05OPOSSUMCK 138.0 kV Ckt 1	<u>AEP</u> AEPA0033a (112) : Reconductor/Rebuild 4.2 miles between Opossum Creek-Candlers Mountain 138 kV which currently has 556.5 ACSR 26/7 Dove Project Type : FAC Cost : \$6,300,000 Time Estimate : 12-18 Months	\$6,300,000

ID	Idx	Facility	Upgrade Description	Cost
161696850	3	AF1-323 TAP 138.0 kV - 05SCOTSV 138.0 kV Ckt 1	<u>AEP</u> AEPA0034a (437) : A sag study will be required on the 0.85 miles of ACSR ~ 397.5 ~ 30/7 ~ LARK - Conductor to determine what mitigation would be required (if any) to operate at the conductor's MOT. Depending on the sag study results, the cost for this upgrade is expected to be between \$3,400 (no remediation required, just sag study) and \$1.275 million (complete line reconductor/rebuild). Time Estimate: a) Sag Study: 6-12 months b) Rebuild: The standard tiem required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement Project Type : FAC Cost : \$3,400 Time Estimate : 6 - 12 months Months	\$3,400
161696809	8	AC1-123 TAP 138.0 kV - 05CAMDLM 138.0 kV Ckt 1	<u>AEP</u> AEPA0027a (440) : Reconductor/ Rebuild 17.2 miles between Candiers Mountain - Redeye 138kV which currently has ACSR ~ 556 ACSR ~ 26/7 overhead conductor Project Type : FAC Cost : \$34,400,000 Time Estimate : 24 - 36 months Months	\$34,400,000
			TOTAL COST	\$97,387,400

12.6 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".

12.6.1 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
167931902	242549	05BANSTR	AEP	242632	05EDAN 2	AEP	1	AEP_P2-1_242720 05MONETA 138 242775 05ROCKCAS SS 138 1	single	296.0	102.59	105.19	DC	7.7

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
242889	05REUSENS	0.0515	80/20	0.0515
246843	05SMG1	3.5712	80/20	3.5712
246844	05SMG2	9.7076	80/20	9.7076
246845	05SMG3	6.0861	80/20	6.0861
246846	05SMG4	9.5567	80/20	9.5567
246847	05SMG5	3.7221	80/20	3.7221
247284	05LEESVG	1.9442	80/20	1.9442
315156	1HALLBR1	1.2904	80/20	1.2904
316123	AC1-075 C	0.4585	80/20	0.4585
925661	AC1-042 C	2.7205	80/20	2.7205
926023	AC1-080 C	0.1532	80/20	0.1532
926051	AC1-083 C O1	19.0954	80/20	19.0954
926521	AC1-123 C O1	2.0209	80/20	2.0209
926645	AC1-145 C	0.5110	80/20	0.5110
933941	AD1-017 C	3.8191	80/20	3.8191
935241	AD1-161 C	2.5993	80/20	2.5993
938451	AE1-064 C	21.4559	80/20	21.4559
939941	AE1-230 C	1.2273	80/20	1.2273
940081	AE1-250 C	57.5154	80/20	57.5154
941801	AE2-185 C	6.1366	80/20	6.1366
941821	AE2-187 C	6.1366	80/20	6.1366
942671	AE2-283 C	6.7502	80/20	6.7502
942751	AE2-291 C	6.1176	80/20	6.1176
942761	AE2-292 C O1	7.6170	80/20	7.6170
945081	AF1-173	2.3779	80/20	2.3779
958131	AF2-107 C	1.8934	80/20	1.8934
961121	AF2-403	1.3637	80/20	1.3637
962741	AG1-123 C O1	3.0900	80/20	3.0900
962751	AG1-124 C O1	4.1436	80/20	4.1436
963601	AG1-209 C	0.4773	80/20	0.4773
964141	AG1-275 C	2.0455	80/20	2.0455
964151	AG1-276 C	2.0455	80/20	2.0455
964251	AG1-286 C	0.8361	80/20	0.8361
964531	AG1-316 C O1	7.6979	80/20	7.6979
966251	AG1-494 C	1.3718	80/20	1.3718
966691	AG1-539 C	3.1987	80/20	3.1987
966761	AG1-547 C	5.5468	80/20	5.5468
CALDERWOOD	CALDERWOOD	0.3628	Confirmed LTF	0.3628
NY	NY	0.0553	Confirmed LTF	0.0553

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
PRAIRIE	PRAIRIE	0.7801	Confirmed LTF	0.7801
CHEOAH	CHEOAH	0.3804	Confirmed LTF	0.3804
COTTONWOOD	COTTONWOOD	1.2369	Confirmed LTF	1.2369
HAMLET	HAMLET	1.1966	Confirmed LTF	1.1966
GIBSON	GIBSON	0.0814	Confirmed LTF	0.0814
BLUEG	BLUEG	0.1962	Confirmed LTF	0.1962
TRIMBLE	TRIMBLE	0.0590	Confirmed LTF	0.0590
CATAWBA	CATAWBA	0.5712	Confirmed LTF	0.5712

12.6.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
161696819	242575	05CAMDLM	AEP	242737	05OPOSSUMCK	AEP	1	AEP_P2-2_#10292_05NEWLDN 138_1	bus	284.0	91.31	113.07	DC	61.8

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.9399	50/50	1.9399
246844	05SMG2	5.2732	50/50	5.2732
246845	05SMG3	3.3060	50/50	3.3060
246846	05SMG4	5.1913	50/50	5.1913
246847	05SMG5	2.0219	50/50	2.0219
247284	05LEESVG	1.0979	50/50	1.0979
925661	AC1-042 C	1.6528	50/50	1.6528
925662	AC1-042 E	2.6967	50/50	2.6967
925997	AC1-075 E	1.0121	Adder	1.19
926024	AC1-080 E	0.3358	Adder	0.4
926051	AC1-083 C O1	4.8651	50/50	4.8651
926052	AC1-083 E O1	7.9379	50/50	7.9379
926521	AC1-123 C O1	3.6473	50/50	3.6473
926522	AC1-123 E O1	10.8777	50/50	10.8777
926645	AC1-145 C	0.3104	50/50	0.3104
926646	AC1-145 E	1.7657	50/50	1.7657
933941	AD1-017 C	0.9730	50/50	0.9730
933942	AD1-017 E	1.5876	50/50	1.5876
938451	AE1-064 C	9.5344	50/50	9.5344
938452	AE1-064 E	4.9301	50/50	4.9301
939011	AE1-130 C	3.6885	Adder	4.34
939012	AE1-130 E	1.8476	Adder	2.17
939941	AE1-230 C	0.7456	50/50	0.7456
939942	AE1-230 E	1.3256	50/50	1.3256
940081	AE1-250 C	7.2262	Adder	8.5
940082	AE1-250 E	4.8175	Adder	5.67
941801	AE2-185 C	3.7282	50/50	3.7282
941802	AE2-185 E	2.4854	50/50	2.4854
941821	AE2-187 C	3.7282	50/50	3.7282
941822	AE2-187 E	1.6570	50/50	1.6570
942671	AE2-283 C	4.1010	50/50	4.1010
942672	AE2-283 E	2.1540	50/50	2.1540
942751	AE2-291 C	3.4203	Adder	4.02
942752	AE2-291 E	2.2802	Adder	2.68
942761	AE2-292 C O1	4.2586	Adder	5.01
942762	AE2-292 E O1	2.8391	Adder	3.34
945081	AF1-173	1.4447	50/50	1.4447
961121	AF2-403	0.8285	50/50	0.8285
963601	AG1-209 C	0.2900	50/50	0.2900
963602	AG1-209 E	0.4350	50/50	0.4350
964141	AG1-275 C	1.2427	50/50	1.2427

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964142	AG1-275 E	0.8285	50/50	0.8285
964151	AG1-276 C	1.2427	50/50	1.2427
964152	AG1-276 E	0.8285	50/50	0.8285
964251	AG1-286 C	0.6214	50/50	0.6214
964252	AG1-286 E	0.4142	50/50	0.4142
964531	AG1-316 C O1	49.4419	50/50	49.4419
964532	AG1-316 E O1	12.3605	50/50	12.3605
966253	AG1-494 BAT	2.2424	Merchant Transmission	2.2424
966691	AG1-539 C	0.9479	Adder	2.1
966692	AG1-539 E	1.2737	Adder	2.83
966761	AG1-547 C	3.3698	50/50	3.3698
966762	AG1-547 E	1.8082	50/50	1.8082
CPLE	CPLE	0.6825	Confirmed LTF	0.6825
NY	NY	0.0476	Confirmed LTF	0.0476
PRAIRIE	PRAIRIE	0.1627	Confirmed LTF	0.1627
TVA	TVA	0.0602	Confirmed LTF	0.0602
O-066	O-066	0.5115	Confirmed LTF	0.5115
CBM-S2	CBM-S2	6.4310	Confirmed LTF	6.4310
CBM-S1	CBM-S1	0.0038	Confirmed LTF	0.0038
G-007	G-007	0.0788	Confirmed LTF	0.0788
GIBSON	GIBSON	0.0682	Confirmed LTF	0.0682
BLUEG	BLUEG	0.2448	Confirmed LTF	0.2448
TRIMBLE	TRIMBLE	0.0801	Confirmed LTF	0.0801
LAGN	LAGN	0.0962	Confirmed LTF	0.0962

12.6.3 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
161696850	946590	AF1-323 TAP	AEP	242792	05SCOTSV	AEP	1	DVP_P2-2: BREMO B1	bus	167.0	99.5	100.62	DC	4.15

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935241	AD1-161 C	1.4796	Adder	1.74
935242	AD1-161 E	1.2151	Adder	1.43
946293	AF1-293 BAT	13.6367	50/50	13.6367
946591	AF1-323 C	18.1464	50/50	18.1464
946592	AF1-323 E	12.0976	50/50	12.0976
958131	AF2-107 C	8.0379	50/50	8.0379
958132	AF2-107 E	4.4046	50/50	4.4046
960111	AF2-302 C	6.5987	50/50	6.5987
960112	AF2-302 E	4.3991	50/50	4.3991
961063	AF2-397 BAT	4.2883	Merchant Transmission	4.2883
961801	AG1-022 C	6.5987	50/50	6.5987
961802	AG1-022 E	4.3991	50/50	4.3991
962741	AG1-123 C O1	5.3884	50/50	5.3884
962742	AG1-123 E O1	3.7548	50/50	3.7548
962751	AG1-124 C O1	2.6383	Adder	5.86
962752	AG1-124 E O1	1.8410	Adder	4.09
964531	AG1-316 C O1	1.4964	Adder	3.32
964532	AG1-316 E O1	0.3741	Adder	0.83
965582	AG1-426 BAT	7.6246	50/50	7.6246
966251	AG1-494 C	2.8536	50/50	2.8536
966252	AG1-494 E	4.2804	50/50	4.2804
966792	AG1-550 BAT	1.2748	Merchant Transmission	1.2748
WEC	WEC	0.1405	Confirmed LTF	0.1405
LGEE	LGEE	0.3041	Confirmed LTF	0.3041
CPL	CPL	0.3269	Confirmed LTF	0.3269
CBM-W2	CBM-W2	4.5786	Confirmed LTF	4.5786
NY	NY	0.1377	Confirmed LTF	0.1377
TVA	TVA	0.7826	Confirmed LTF	0.7826
O-066	O-066	2.0123	Confirmed LTF	2.0123
SIGE	SIGE	0.0819	Confirmed LTF	0.0819
CBM-S2	CBM-S2	5.8151	Confirmed LTF	5.8151
CBM-S1	CBM-S1	0.2071	Confirmed LTF	0.2071
G-007	G-007	0.3171	Confirmed LTF	0.3171
MEC	MEC	0.7468	Confirmed LTF	0.7468
LAGN	LAGN	0.9397	Confirmed LTF	0.9397
CBM-W1	CBM-W1	5.9445	Confirmed LTF	5.9445

12.6.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
161696698	242687	05JOHNT	AEP	242734	05NEWLDN	AEP	1	AEP_P2-2_#13260_05SKIMMR 69.0_1	bus	240.0	148.66	149.34	DC	3.06

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.1693	50/50	1.1693
246844	05SMG2	3.1786	50/50	3.1786
246845	05SMG3	1.9928	50/50	1.9928
246846	05SMG4	3.1292	50/50	3.1292
246847	05SMG5	1.2187	50/50	1.2187
247284	05LEESVG	1.8564	50/50	1.8564
315156	1HALLBR1	2.9223	50/50	2.9223
316118	AC1-105 C	1.8331	Adder	2.16
316123	AC1-075 C	1.2269	50/50	1.2269
925661	AC1-042 C	5.9959	50/50	5.9959
925662	AC1-042 E	9.7827	50/50	9.7827
925997	AC1-075 E	4.4060	50/50	4.4060
926023	AC1-080 C	0.4100	50/50	0.4100
926024	AC1-080 E	1.4619	50/50	1.4619
926051	AC1-083 C O1	2.5478	Adder	3.0
926052	AC1-083 E O1	4.1570	Adder	4.89
926274	AC1-105 E	0.9006	Adder	1.06
926645	AC1-145 C	1.1261	50/50	1.1261
926646	AC1-145 E	6.4053	50/50	6.4053
927261	AC1-222 C	1.9259	Adder	2.27
927262	AC1-222 E	1.8334	Adder	2.16
933941	AD1-017 C	0.5096	Adder	0.6
933942	AD1-017 E	0.8314	Adder	0.98
934311	AD1-055 C	1.3372	Adder	1.57
934312	AD1-055 E	0.3448	Adder	0.41
938451	AE1-064 C	4.7778	Adder	5.62
938452	AE1-064 E	2.4705	Adder	2.91
939941	AE1-230 C	2.7049	50/50	2.7049
939942	AE1-230 E	4.8087	50/50	4.8087
941801	AE2-185 C	13.5245	50/50	13.5245
941802	AE2-185 E	9.0163	50/50	9.0163
941821	AE2-187 C	13.5245	50/50	13.5245
941822	AE2-187 E	6.0109	50/50	6.0109
942671	AE2-283 C	14.8769	50/50	14.8769
942672	AE2-283 E	7.8141	50/50	7.8141
942751	AE2-291 C	15.1898	50/50	15.1898
942752	AE2-291 E	10.1266	50/50	10.1266
942761	AE2-292 C O1	18.9128	50/50	18.9128
942762	AE2-292 E O1	12.6086	50/50	12.6086
943901	AF1-058 C	0.7117	Adder	0.84
943902	AF1-058 E	0.4744	Adder	0.56

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945081	AF1-173	5.2407	50/50	5.2407
960061	AF2-297 C	2.8466	Adder	3.35
960062	AF2-297 E	1.8977	Adder	2.23
961121	AF2-403	3.0054	50/50	3.0054
962441	AG1-093 C O1	2.5908	Adder	5.75
962442	AG1-093 E O1	0.7885	Adder	1.75
963601	AG1-209 C	1.0519	50/50	1.0519
963602	AG1-209 E	1.5779	50/50	1.5779
964141	AG1-275 C	4.5082	50/50	4.5082
964142	AG1-275 E	3.0054	50/50	3.0054
964151	AG1-276 C	4.5082	50/50	4.5082
964152	AG1-276 E	3.0054	50/50	3.0054
964251	AG1-286 C	3.3401	50/50	3.3401
964252	AG1-286 E	2.2268	50/50	2.2268
964261	AG1-287 C	0.2829	Adder	0.63
964262	AG1-287 E	0.1886	Adder	0.42
964471	AG1-310 C	1.4850	50/50	1.4850
964472	AG1-310 E	0.7314	50/50	0.7314
964533	AG1-316 BAT	1.6207	Merchant Transmission	1.6207
966253	AG1-494 BAT	2.5943	Merchant Transmission	2.5943
966691	AG1-539 C	7.9424	50/50	7.9424
966692	AG1-539 E	10.6726	50/50	10.6726
966761	AG1-547 C	12.2246	50/50	12.2246
966762	AG1-547 E	6.5594	50/50	6.5594
CPLE	CPLE	0.9111	Confirmed LTF	0.9111
NY	NY	0.0210	Confirmed LTF	0.0210
PRAIRIE	PRAIRIE	0.4288	Confirmed LTF	0.4288
O-066	O-066	0.0673	Confirmed LTF	0.0673
CBM-S2	CBM-S2	8.1014	Confirmed LTF	8.1014
COTTONWOOD	COTTONWOOD	0.0105	Confirmed LTF	0.0105
G-007	G-007	0.0084	Confirmed LTF	0.0084
GIBSON	GIBSON	0.1381	Confirmed LTF	0.1381
BLUEG	BLUEG	0.4826	Confirmed LTF	0.4826
TRIMBLE	TRIMBLE	0.1564	Confirmed LTF	0.1564

12.6.5 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
161696693	242741	05OTTER	AEP	242687	05JOHNMT	AEP	1	AEP_P2-2_#13260_05SKIMMR69.0_1	bus	245.0	149.16	149.82	DC	3.06

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.1693	50/50	1.1693
246844	05SMG2	3.1786	50/50	3.1786
246845	05SMG3	1.9928	50/50	1.9928
246846	05SMG4	3.1292	50/50	3.1292
246847	05SMG5	1.2187	50/50	1.2187
247284	05LEESVG	1.8564	50/50	1.8564
315156	1HALLBR1	2.9223	50/50	2.9223
316118	AC1-105 C	1.8331	Adder	2.16
316123	AC1-075 C	1.2269	50/50	1.2269
925661	AC1-042 C	5.9959	50/50	5.9959
925662	AC1-042 E	9.7827	50/50	9.7827
925997	AC1-075 E	4.4060	50/50	4.4060
926023	AC1-080 C	0.4100	50/50	0.4100
926024	AC1-080 E	1.4619	50/50	1.4619
926051	AC1-083 C O1	2.5478	Adder	3.0
926052	AC1-083 E O1	4.1570	Adder	4.89
926274	AC1-105 E	0.9006	Adder	1.06
926645	AC1-145 C	1.1261	50/50	1.1261
926646	AC1-145 E	6.4053	50/50	6.4053
927261	AC1-222 C	1.9259	Adder	2.27
927262	AC1-222 E	1.8334	Adder	2.16
933941	AD1-017 C	0.5096	Adder	0.6
933942	AD1-017 E	0.8314	Adder	0.98
934311	AD1-055 C	1.3372	Adder	1.57
934312	AD1-055 E	0.3448	Adder	0.41
938451	AE1-064 C	4.7778	Adder	5.62
938452	AE1-064 E	2.4705	Adder	2.91
939941	AE1-230 C	2.7049	50/50	2.7049
939942	AE1-230 E	4.8087	50/50	4.8087
940081	AE1-250 C	4.5831	Adder	5.39
940082	AE1-250 E	3.0554	Adder	3.59
941801	AE2-185 C	13.5245	50/50	13.5245
941802	AE2-185 E	9.0163	50/50	9.0163
941821	AE2-187 C	13.5245	50/50	13.5245
941822	AE2-187 E	6.0109	50/50	6.0109
942671	AE2-283 C	14.8769	50/50	14.8769
942672	AE2-283 E	7.8141	50/50	7.8141
942751	AE2-291 C	15.1898	50/50	15.1898
942752	AE2-291 E	10.1266	50/50	10.1266
942761	AE2-292 C O1	18.9128	50/50	18.9128
942762	AE2-292 E O1	12.6086	50/50	12.6086

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943901	AF1-058 C	0.7117	Adder	0.84
943902	AF1-058 E	0.4744	Adder	0.56
945081	AF1-173	5.2407	50/50	5.2407
960061	AF2-297 C	2.8466	Adder	3.35
960062	AF2-297 E	1.8977	Adder	2.23
961121	AF2-403	3.0054	50/50	3.0054
962441	AG1-093 C O1	2.5908	Adder	5.75
962442	AG1-093 E O1	0.7885	Adder	1.75
963601	AG1-209 C	1.0519	50/50	1.0519
963602	AG1-209 E	1.5779	50/50	1.5779
964141	AG1-275 C	4.5082	50/50	4.5082
964142	AG1-275 E	3.0054	50/50	3.0054
964151	AG1-276 C	4.5082	50/50	4.5082
964152	AG1-276 E	3.0054	50/50	3.0054
964261	AG1-287 C	0.2829	Adder	0.63
964262	AG1-287 E	0.1886	Adder	0.42
964471	AG1-310 C	1.4850	50/50	1.4850
964472	AG1-310 E	0.7314	50/50	0.7314
964533	AG1-316 BAT	1.6207	Merchant Transmission	1.6207
966253	AG1-494 BAT	2.5943	Merchant Transmission	2.5943
966691	AG1-539 C	7.9424	50/50	7.9424
966692	AG1-539 E	10.6726	50/50	10.6726
966761	AG1-547 C	12.2246	50/50	12.2246
966762	AG1-547 E	6.5594	50/50	6.5594
CPL	CPL	0.9111	Confirmed LTF	0.9111
NY	NY	0.0210	Confirmed LTF	0.0210
PRAIRIE	PRAIRIE	0.4288	Confirmed LTF	0.4288
O-066	O-066	0.0673	Confirmed LTF	0.0673
CBM-S2	CBM-S2	8.1014	Confirmed LTF	8.1014
COTTONWOOD	COTTONWOOD	0.0105	Confirmed LTF	0.0105
G-007	G-007	0.0084	Confirmed LTF	0.0084
GIBSON	GIBSON	0.1381	Confirmed LTF	0.1381
BLUEG	BLUEG	0.4826	Confirmed LTF	0.4826
TRIMBLE	TRIMBLE	0.1564	Confirmed LTF	0.1564

12.6.6 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
163718006	314667	4ALTVSTA	DVP	242741	05OTTER	AEP	1	AEP_P2-1_242575 05CAMDLM 138 242737 05OPOSSUMCK 138 1	single	245.0	119.19	122.7	DC	8.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.5017	80/20	1.5017
246844	05SMG2	4.0821	80/20	4.0821
246845	05SMG3	2.5592	80/20	2.5592
246846	05SMG4	4.0186	80/20	4.0186
246847	05SMG5	1.5651	80/20	1.5651
247284	05LEESVG	1.8720	80/20	1.8720
315156	1HALLBR1	2.5889	80/20	2.5889
315266	1PLYWOOD A	0.4104	80/20	0.4104
316118	AC1-105 C	1.9558	80/20	1.9558
316123	AC1-075 C	1.0913	80/20	1.0913
925661	AC1-042 C	5.5576	80/20	5.5576
926023	AC1-080 C	0.3647	80/20	0.3647
926051	AC1-083 C O1	3.8182	80/20	3.8182
926521	AC1-123 C O1	1.1507	80/20	1.1507
926645	AC1-145 C	1.0438	80/20	1.0438
927261	AC1-222 C	2.0354	80/20	2.0354
933941	AD1-017 C	0.7636	80/20	0.7636
934311	AD1-055 C	1.4132	80/20	1.4132
938451	AE1-064 C	7.2751	80/20	7.2751
939011	AE1-130 C	3.0996	80/20	3.0996
939941	AE1-230 C	2.5072	80/20	2.5072
940081	AE1-250 C	6.7968	80/20	6.7968
941801	AE2-185 C	12.5359	80/20	12.5359
941821	AE2-187 C	12.5359	80/20	12.5359
942671	AE2-283 C	13.7895	80/20	13.7895
942751	AE2-291 C	13.4879	80/20	13.4879
942761	AE2-292 C O1	16.7937	80/20	16.7937
943901	AF1-058 C	0.7580	80/20	0.7580
945081	AF1-173	4.8577	80/20	4.8577
960061	AF2-297 C	3.0322	80/20	3.0322
961121	AF2-403	2.7858	80/20	2.7858
962441	AG1-093 C O1	5.2155	80/20	5.2155
963601	AG1-209 C	0.9750	80/20	0.9750
964141	AG1-275 C	4.1786	80/20	4.1786
964151	AG1-276 C	4.1786	80/20	4.1786
964261	AG1-287 C	0.5685	80/20	0.5685
964471	AG1-310 C	1.3313	80/20	1.3313
964531	AG1-316 C O1	8.5792	80/20	8.5792
964791	AG1-342 C	1.2630	80/20	1.2630

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
966691	AG1-539 C	7.0525	80/20	7.0525
966761	AG1-547 C	11.3311	80/20	11.3311
CPL	CPL	0.9343	Confirmed LTF	0.9343
NY	NY	0.0304	Confirmed LTF	0.0304
PRAIRIE	PRAIRIE	0.3978	Confirmed LTF	0.3978
CBM-S2	CBM-S2	8.4042	Confirmed LTF	8.4042
GIBSON	GIBSON	0.1321	Confirmed LTF	0.1321
BLUEG	BLUEG	0.4635	Confirmed LTF	0.4635
TRIMBLE	TRIMBLE	0.1503	Confirmed LTF	0.1503
LAGN	LAGN	0.0193	Confirmed LTF	0.0193

12.6.7 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
166950248	314746	4BREMO	DVP	314744	3BREMO	DVP	1	DVP_P7-1: LN 2106-2111	tower	228.0	106.83	107.74	DC	4.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935241	AD1-161 C	1.6457	Adder	1.94
935242	AD1-161 E	1.3514	Adder	1.59
938821	AE1-108 C O1	63.1217	50/50	63.1217
938822	AE1-108 E O1	28.3291	50/50	28.3291
946293	AF1-293 BAT	7.9115	Merchant Transmission	7.9115
946591	AF1-323 C	20.1656	50/50	20.1656
946592	AF1-323 E	13.4438	50/50	13.4438
958131	AF2-107 C	8.9351	50/50	8.9351
958132	AF2-107 E	4.8964	50/50	4.8964
960111	AF2-302 C	7.3330	50/50	7.3330
960112	AF2-302 E	4.8886	50/50	4.8886
961801	AG1-022 C	7.3330	50/50	7.3330
961802	AG1-022 E	4.8886	50/50	4.8886
962741	AG1-123 C O1	5.9944	50/50	5.9944
962742	AG1-123 E O1	4.1771	50/50	4.1771
962751	AG1-124 C O1	6.5196	50/50	6.5196
962752	AG1-124 E O1	4.5494	50/50	4.5494
964531	AG1-316 C O1	1.6607	Adder	3.69
964532	AG1-316 E O1	0.4152	Adder	0.92
965581	AG1-426	13.7520	50/50	13.7520
966251	AG1-494 C	3.1736	50/50	3.1736
966252	AG1-494 E	4.7604	50/50	4.7604
WEC	WEC	0.1559	Confirmed LTF	0.1559
LGEE	LGEE	0.3387	Confirmed LTF	0.3387
CPL	CPL	0.0607	Confirmed LTF	0.0607
CBM-W2	CBM-W2	4.5965	Confirmed LTF	4.5965
NY	NY	0.1288	Confirmed LTF	0.1288
TVA	TVA	0.7490	Confirmed LTF	0.7490
O-066	O-066	1.9652	Confirmed LTF	1.9652
SIGE	SIGE	0.0860	Confirmed LTF	0.0860
CBM-S2	CBM-S2	3.2677	Confirmed LTF	3.2677
CBM-S1	CBM-S1	0.2037	Confirmed LTF	0.2037
G-007	G-007	0.3098	Confirmed LTF	0.3098
MEC	MEC	0.7993	Confirmed LTF	0.7993
LAGN	LAGN	0.8908	Confirmed LTF	0.8908
CBM-W1	CBM-W1	6.6455	Confirmed LTF	6.6455

12.6.8 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
161696809	926520	AC1-123 TAP	AEP	242575	05CAMDLM	AEP	1	AEP_P2-2_#10292_05NEWLDN 138_1	bus	255.0	110.6	114.17	DC	9.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.9399	50/50	1.9399
246844	05SMG2	5.2732	50/50	5.2732
246845	05SMG3	3.3060	50/50	3.3060
246846	05SMG4	5.1913	50/50	5.1913
246847	05SMG5	2.0219	50/50	2.0219
247284	05LEESVG	1.0979	50/50	1.0979
925661	AC1-042 C	1.6528	50/50	1.6528
925662	AC1-042 E	2.6967	50/50	2.6967
925997	AC1-075 E	1.0121	Adder	1.19
926024	AC1-080 E	0.3358	Adder	0.4
926051	AC1-083 C O1	4.8651	50/50	4.8651
926052	AC1-083 E O1	7.9379	50/50	7.9379
926521	AC1-123 C O1	3.6473	50/50	3.6473
926522	AC1-123 E O1	10.8777	50/50	10.8777
926645	AC1-145 C	0.3104	50/50	0.3104
926646	AC1-145 E	1.7657	50/50	1.7657
933941	AD1-017 C	0.9730	50/50	0.9730
933942	AD1-017 E	1.5876	50/50	1.5876
938451	AE1-064 C	9.5344	50/50	9.5344
938452	AE1-064 E	4.9301	50/50	4.9301
939011	AE1-130 C	3.6885	Adder	4.34
939012	AE1-130 E	1.8476	Adder	2.17
939941	AE1-230 C	0.7456	50/50	0.7456
939942	AE1-230 E	1.3256	50/50	1.3256
940081	AE1-250 C	7.2262	Adder	8.5
940082	AE1-250 E	4.8175	Adder	5.67
941801	AE2-185 C	3.7282	50/50	3.7282
941802	AE2-185 E	2.4854	50/50	2.4854
941821	AE2-187 C	3.7282	50/50	3.7282
941822	AE2-187 E	1.6570	50/50	1.6570
942671	AE2-283 C	4.1010	50/50	4.1010
942672	AE2-283 E	2.1540	50/50	2.1540
942751	AE2-291 C	3.4203	Adder	4.02
942752	AE2-291 E	2.2802	Adder	2.68
942761	AE2-292 C O1	4.2586	Adder	5.01
942762	AE2-292 E O1	2.8391	Adder	3.34
945081	AF1-173	1.4447	50/50	1.4447
961121	AF2-403	0.8285	50/50	0.8285
963601	AG1-209 C	0.2900	50/50	0.2900
963602	AG1-209 E	0.4350	50/50	0.4350
964141	AG1-275 C	1.2427	50/50	1.2427

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964142	AG1-275 E	0.8285	50/50	0.8285
964151	AG1-276 C	1.2427	50/50	1.2427
964152	AG1-276 E	0.8285	50/50	0.8285
964251	AG1-286 C	0.6214	50/50	0.6214
964252	AG1-286 E	0.4142	50/50	0.4142
964533	AG1-316 BAT	9.0988	50/50	9.0988
966253	AG1-494 BAT	2.2424	Merchant Transmission	2.2424
966691	AG1-539 C	0.9479	Adder	2.1
966692	AG1-539 E	1.2737	Adder	2.83
966761	AG1-547 C	3.3698	50/50	3.3698
966762	AG1-547 E	1.8082	50/50	1.8082
CPL	CPL	0.6825	Confirmed LTF	0.6825
NY	NY	0.0476	Confirmed LTF	0.0476
PRAIRIE	PRAIRIE	0.1627	Confirmed LTF	0.1627
TVA	TVA	0.0602	Confirmed LTF	0.0602
O-066	O-066	0.5115	Confirmed LTF	0.5115
CBM-S2	CBM-S2	6.4310	Confirmed LTF	6.4310
CBM-S1	CBM-S1	0.0038	Confirmed LTF	0.0038
G-007	G-007	0.0788	Confirmed LTF	0.0788
GIBSON	GIBSON	0.0682	Confirmed LTF	0.0682
BLUEG	BLUEG	0.2448	Confirmed LTF	0.2448
TRIMBLE	TRIMBLE	0.0801	Confirmed LTF	0.0801
LAGN	LAGN	0.0962	Confirmed LTF	0.0962

12.6.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
166950175	938820	AE1-108 TAP	DVP	314746	4BREMO	DVP	1	DVP_P7-1: LN 2106-2111	tower	173.0	140.8	142.0	DC	4.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935241	AD1-161 C	1.6457	Adder	1.94
935242	AD1-161 E	1.3514	Adder	1.59
938821	AE1-108 C O1	63.1217	50/50	63.1217
938822	AE1-108 E O1	28.3291	50/50	28.3291
946293	AF1-293 BAT	7.9115	Merchant Transmission	7.9115
946591	AF1-323 C	20.1656	50/50	20.1656
946592	AF1-323 E	13.4438	50/50	13.4438
958131	AF2-107 C	8.9351	50/50	8.9351
958132	AF2-107 E	4.8964	50/50	4.8964
960111	AF2-302 C	7.3330	50/50	7.3330
960112	AF2-302 E	4.8886	50/50	4.8886
961801	AG1-022 C	7.3330	50/50	7.3330
961802	AG1-022 E	4.8886	50/50	4.8886
962741	AG1-123 C O1	5.9944	50/50	5.9944
962742	AG1-123 E O1	4.1771	50/50	4.1771
962751	AG1-124 C O1	6.5196	50/50	6.5196
962752	AG1-124 E O1	4.5494	50/50	4.5494
964531	AG1-316 C O1	1.6607	Adder	3.69
964532	AG1-316 E O1	0.4152	Adder	0.92
965581	AG1-426	13.7520	50/50	13.7520
966251	AG1-494 C	3.1736	50/50	3.1736
966252	AG1-494 E	4.7604	50/50	4.7604
WEC	WEC	0.1559	Confirmed LTF	0.1559
LGEE	LGEE	0.3387	Confirmed LTF	0.3387
CPL	CPL	0.0607	Confirmed LTF	0.0607
CBM-W2	CBM-W2	4.5965	Confirmed LTF	4.5965
NY	NY	0.1288	Confirmed LTF	0.1288
TVA	TVA	0.7490	Confirmed LTF	0.7490
O-066	O-066	1.9652	Confirmed LTF	1.9652
SIGE	SIGE	0.0860	Confirmed LTF	0.0860
CBM-S2	CBM-S2	3.2677	Confirmed LTF	3.2677
CBM-S1	CBM-S1	0.2037	Confirmed LTF	0.2037
G-007	G-007	0.3098	Confirmed LTF	0.3098
MEC	MEC	0.7993	Confirmed LTF	0.7993
LAGN	LAGN	0.8908	Confirmed LTF	0.8908
CBM-W1	CBM-W1	6.6455	Confirmed LTF	6.6455

12.7 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
AC1-042	Altavista-Mt. Airy 69kV	Engineering and Procurement
AC1-075	Perth-Hickory Grove 115kV	Engineering and Procurement
AC1-080	Perth-Hickory Grove 115kV	Engineering and Procurement
AC1-083	Smith Mountain-Bearskin 138kV	Active
AC1-105	Halifax-Mt. Laurel 115kV	Engineering and Procurement
AC1-123	Smith Mountain-Candler's Mountain 138kV	Under Construction
AC1-145	Gretna DP 69 kV	Engineering and Procurement
AC1-222	Crystal Hill-Halifax 115kV	Engineering and Procurement
AD1-017	Smith Mountain-Bearskin 138 kV	Active
AD1-055	Crystal Hill-Halifax 115 kV	Engineering and Procurement
AD1-161	Stonewall-Long Mountain 69 kV	Active
AE1-064	Rockcastle 138 kV	Active
AE1-108	Bremo-Scottsville 138 kV	Active
AE1-130	Meads Store 138 kV	Active
AE1-230	Shockoe 69 kV	Active
AE1-250	Smith Mountain-E. Danville 138 kV	Active
AE2-185	Gladys DP-Stonemill Switching Station 69 kV	Active
AE2-187	Shockoe DP-Chatham 69 kV	Active
AE2-283	Gladys-Stone Mill 69 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
AF1-173	Gretna DP-Shockoe DP 69 kV	Active
AF1-293	Kidds Store-Fort Union 115 kV	Active
AF1-323	Scottsville-Colleen 138 kV	Active
AF2-107	Clifford 138 kV	Active
AF2-297	Sedge Hill 115 kV	Active
AF2-302	Scottsville-Colleen 138 kV	Active
AF2-397	Fork Union-Mt. Eagle 230 kV	Active
AF2-403	Shockoe DP-Chatham 69 kV	Active
AG1-022	Scottsville-Colleen 138 kV	Active
AG1-093	Halifax-Chase City 115 kV	Active
AG1-123	Amherst-Riverville 138 kV	Active
AG1-124	Gladstone 138 kV	Active
AG1-209	Gretna 12.5 kV	Active
AG1-275	Gladys DP-Stone Mill 69 kV	Active
AG1-276	Gladys DP-Stone Mill 69 kV	Active
AG1-286	Johnson Mountain 138 kV	Active
AG1-287	South Boston 12.5 kV	Active

Queue Number	Project Name	Status
AG1-310	Crystal Hill-Perth 115 kV	Active
AG1-316	Rustburg 138 kV	Active
AG1-342	Dryburg 115 kV	Active
AG1-426	Bremo-Scottsville 138 kV	Active
AG1-494	Boxwood-Riverville 138 kV	Active
AG1-539	Grit DP-Perth 115 kV	Active
AG1-547	Mount Airy-Chatham 69 kV	Active
AG1-550	Mount Eagle-Fork Union 230 kV	Active

12.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
AEP_P2-1_242549 05BANSTR 138 940080 AE1-250 TAP 138 1-A	CONTINGENCY 'AEP_P2-1_242549 05BANSTR 138 940080 AE1-250 TAP 138 1-A' OPEN BRANCH FROM BUS 242549 TO BUS 940080 CKT 1 END
DVP_P2-2: BREMO B1	CONTINGENCY 'DVP_P2-2: BREMO B1' /* BREMO 230 KV OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G118.000 OPEN BUS 315191 /* ISLAND: 1BEARGRDN G118.000 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G218.000 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN S122.000 OPEN BUS 315192 /* ISLAND: 1BEARGRDN G218.000 OPEN BUS 315193 /* ISLAND: 1BEARGRDN S122.000 OPEN BRANCH FROM BUS 314677 TO BUS 314747 CKT 1 /* 6BUCKING 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313868 TO BUS 314747 CKT 1 /* 6CARTERV 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313867 TO BUS 314747 CKT 1 /* 6BREMODIST 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314744 TO BUS 314747 CKT 1 /* 3BREMO 115.00 - 6BREMO 230.00 OPEN BUS 314747 /* 6BREMO 230.00 KV OPEN BUS 314326 /* ISLAND: 6BEARGRDN 230.00 END
AEP_P2-1_242575 05CAMDLM 138 242737 05OPOSSUMCK 138 1	CONTINGENCY 'AEP_P2-1_242575 05CAMDLM 138 242737 05OPOSSUMCK 138 1' OPEN BRANCH FROM BUS 242575 TO BUS 242737 CKT 1 END
AEP_P2-2_#6213_05WLAKE 138_1	CONTINGENCY 'AEP_P2-2_#6213_05WLAKE 138_1' OPEN BRANCH FROM BUS 242748 TO BUS 243951 CKT 1 / 242748 05PENHOK 138 243951 05REDWOOD 138 1 OPEN BRANCH FROM BUS 242748 TO BUS 242802 CKT 1 / 242748 05PENHOK 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242843 TO BUS 243951 CKT 1 / 242843 05WLAKE 138 243951 05REDWOOD 138 1 END
AEP_P4_#311_05CLOVRD	CONTINGENCY "'AEP_P4_#311_05CLOVRD' 765_CC2" / 1395 OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 END

Contingency Name	Contingency Definition
DVP_P2-2: DOOMS B2	CONTINGENCY 'DVP_P2-2: DOOMS B2' /* DOOMS 115 KV OPEN BRANCH FROM BUS 314767 TO BUS 314793 CKT 1 /* 3MIDWAY 115.00 - 3DOOMS 115.00 OPEN BRANCH FROM BUS 314791 TO BUS 314793 CKT 1 /* 3BRND DP 115.00 - 3DOOMS 115.00 OPEN BRANCH FROM BUS 314793 TO BUS 314819 CKT 1 /* 3DOOMS 115.00 - 3WAYNSBO 115.00 END
AEP_P7-1_#10829	CONTINGENCY 'AEP_P7-1_#10829' OPEN BRANCH FROM BUS 242555 TO BUS 242773 CKT 1 / 242555 05BLAINE 138 242773 05ROANO1 138 1 OPEN BRANCH FROM BUS 242736 TO BUS 243799 CKT 1 / 242736 05OAKLEV 138 243799 05FIELDAL2 138 1 OPEN BRANCH FROM BUS 242656 TO BUS 242736 CKT 1 / 242656 05GRASSH 138 242736 05OAKLEV 138 1 OPEN BRANCH FROM BUS 242656 TO BUS 242774 CKT 1 / 242656 05GRASSH 138 242774 05ROANO2 138 1 OPEN BRANCH FROM BUS 242656 TO BUS 242826 CKT 1 / 242656 05GRASSH 138 242826 05TANKHL 138 1 END
AEP_P2-1_242641 05FOREST 138 242734 05NEWLDN 138 1	CONTINGENCY 'AEP_P2-1_242641 05FOREST 138 242734 05NEWLDN 138 1' OPEN BRANCH FROM BUS 242641 TO BUS 242734 CKT 1 END
DVP_P7-1: LN 2106-2111	CONTINGENCY 'DVP_P7-1: LN 2106-2111' /* . OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G118.000 OPEN BUS 315191 /* ISLAND: 1BEARGRDN G118.000 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G218.000 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN S122.000 OPEN BUS 315192 /* ISLAND: 1BEARGRDN G218.000 OPEN BUS 315193 /* ISLAND: 1BEARGRDN S122.000 END
AP-P2-3-PE-500-014	CONTINGENCY "'AP-P2-3-PE-500-014'" / 181 OPEN BRANCH FROM BUS 235103 TO BUS 964990 CKT 1 / 235103 01BLACKO 500 964990 AG1-363 TAP 500 1 OPEN BRANCH FROM BUS 235446 TO BUS 235103 CKT 3 / 235446 01BLACKO 138 235103 01BLACKO 500 3 OPEN BRANCH FROM BUS 235103 TO BUS 235130 CKT 1 / 235103 01BLACKO 500 235130 01BO_SVC 23.0 1 DECREASE BUS 235103 SHUNT BY 100.00 PERCENT /* 235103 01BLACKO 500 END

Contingency Name	Contingency Definition
AP-P2-3-PE-500-015	CONTINGENCY "'AP-P2-3-PE-500-015"' / 182 OPEN BRANCH FROM BUS 235103 TO BUS 964990 CKT 1 / 235103 01BLACKO 500 964990 AG1-363 TAP 500 1 OPEN BRANCH FROM BUS 235101 TO BUS 235103 CKT 1 / 235101 01BEDNGT 500 235103 01BLACKO 500 1 END
AEP_P2-2_#10292_05NEWLDN 138_1	CONTINGENCY 'AEP_P2-2_#10292_05NEWLDN 138_1' OPEN BRANCH FROM BUS 242569 TO BUS 242734 CKT 1 / 242569 05BRUSHT 138 242734 05NEWLDN 138 1 OPEN BRANCH FROM BUS 242641 TO BUS 242734 CKT 1 / 242641 05FOREST 138 242734 05NEWLDN 138 1 OPEN BRANCH FROM BUS 242687 TO BUS 242734 CKT 1 / 242687 05JOHNMT 138 242734 05NEWLDN 138 1 END
AEP_P2-1_242720 05MONETA 138 242775 05ROCKCAS SS 138 1	CONTINGENCY 'AEP_P2-1_242720 05MONETA 138 242775 05ROCKCAS SS 138 1' OPEN BRANCH FROM BUS 242720 TO BUS 242775 CKT 1 END
DVP_P1-2: LN 104	CONTINGENCY 'DVP_P1-2: LN 104' OPEN BRANCH FROM BUS 242701 TO BUS 314667 CKT 1 /* 05LEESVI 138.00 - 4ALTVSTA 138.00 END
AEP_P1-2_#5366_42-A	CONTINGENCY 'AEP_P1-2_#5366_42-A' OPEN BRANCH FROM BUS 242549 TO BUS 940080 CKT 1 / 242549 05BANSTR 138 940080 AE1-250 TAP 138 1 OPEN BRANCH FROM BUS 242549 TO BUS 242632 CKT 1 / 242549 05BANSTR 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242549 TO BUS 314668 CKT Z1 / 242549 05BANSTR 138 314668 4BANISTR 138 Z1 END
DVP_P7-1: LN 555-2168-A	CONTINGENCY 'DVP_P7-1: LN 555-2168-A' /* . OPEN BRANCH FROM BUS 314907 TO BUS 314912 CKT 1 /* 8DOOMS 500.00 - 8LEXNGTN 500.00 OPEN BRANCH FROM BUS 314794 TO BUS 965530 CKT 1 /* 6DOOMS 230.00 - AG1- 421 TAP 230.00 END
Base Case	

Contingency Name	Contingency Definition
AEP_P4_#2914_05J.FERR	CONTINGENCY "'AEP_P4_#2914_05J.FERR' 765_B2" / 1487 OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 OPEN BRANCH FROM BUS 242514 TO BUS 245993 CKT 4 / 242514 05J.FERR 765 245993 05J.FERR SVS 20.6 4 REMOVE SWSHUNT FROM BUS 242514 /* 242514 05J.FERR 765 END
AEP_P2-2_#13260_05SKIMMR 69.0_1	CONTINGENCY 'AEP_P2-2_#13260_05SKIMMR 69.0_1' OPEN BRANCH FROM BUS 242886 TO BUS 314861 CKT 1 / 242886 05SKIMMR 69.0 314861 3SKIMMR 115 1 OPEN BRANCH FROM BUS 242886 TO BUS 314861 CKT 2 / 242886 05SKIMMR 69.0 314861 3SKIMMR 115 2 OPEN BRANCH FROM BUS 242860 TO BUS 242886 CKT 1 / 242860 05ABERT 69.0 242886 05SKIMMR 69.0 1 OPEN BRANCH FROM BUS 242884 TO BUS 242886 CKT 1 / 242884 05S.LYNCHB 69.0 242886 05SKIMMR 69.0 1 REMOVE SWSHUNT FROM BUS 242886 / 242886 05SKIMMR 69.0 END
AEP_P1-2_#3174_6	CONTINGENCY 'AEP_P1-2_#3174_6' OPEN BRANCH FROM BUS 242512 TO BUS 242515 CKT 1 / 242512 05CLOVRD 765 242515 05JOSHUA 765 1 END
AEP_P1-2_#5419_105	CONTINGENCY 'AEP_P1-2_#5419_105' OPEN BRANCH FROM BUS 242607 TO BUS 243892 CKT 1 / 242607 05CLOVRD 138 243892 05MEADS8 138 1 OPEN BRANCH FROM BUS 242720 TO BUS 243892 CKT 1 / 242720 05MONETA 138 243892 05MEADS8 138 1 OPEN BRANCH FROM BUS 242720 TO BUS 242775 CKT 1 / 242720 05MONETA 138 242775 05ROCKCAS SS 138 1 OPEN BRANCH FROM BUS 242775 TO BUS 242802 CKT 1 / 242775 05ROCKCAS SS 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242775 TO BUS 245675 CKT Z1 / 242775 05ROCKCAS SS 138 245675 05WHITEHOU8 138 Z1 OPEN BRANCH FROM BUS 243892 TO BUS 243893 CKT Z1 / 243892 05MEADS8 138 243893 05MEADS 8 24.9 Z1 REMOVE LOAD C1 FROM BUS 242775 / 242775 05ROCKCAS SS 138 C1 END
AEP_P7-1_#10830	CONTINGENCY 'AEP_P7-1_#10830' OPEN BRANCH FROM BUS 242555 TO BUS 242843 CKT 1 / 242555 05BLAINE 138 242843 05WLAKE 138 1 OPEN BRANCH FROM BUS 242748 TO BUS 243951 CKT 1 / 242748 05PENHOK 138 243951 05REDWOOD 138 1 OPEN BRANCH FROM BUS 242748 TO BUS 242802 CKT 1 / 242748 05PENHOK 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242843 TO BUS 243951 CKT 1 / 242843 05WLAKE 138 243951 05REDWOOD 138 1 END

Contingency Name	Contingency Definition
AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	CONTINGENCY 'AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1' OPEN BRANCH FROM BUS 242607 TO BUS 243892 CKT 1 END

13 Short Circuit Analysis - Primary POI

The following Breakers are overdutied

None

14 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AG1-316 was evaluated as a 80.0 MW (Capacity 64.0 MW) injection at the Sherwill 69 kV substation in the AEP area. Project AG1-316 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-316 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

14.1 Generation Deliverability

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

None

14.2 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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADI NG %	POST PROJE CT LOADI NG %	AC DC	MW IMPACT
174052289	242802	05SMITHM TN	138.0	AEP	242775	05ROCKC AS SS	138.0	AEP	1	AEP_P4_#10164_05 EDAN 2 138_M	breaker	409.0	99.38	100.02	DC	5.8

14.3 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 PROJE CT LOADI NG %	POST PROJE CT LOADI NG %	AC DC	MW IMPACT
161696720	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P2-2_#6213_05WLAKELAKE 138_1	bus	296.0	138.22	139.19	DC	6.38
161697085	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P7-1_#10830	tower	296.0	138.22	139.19	DC	6.38
173864879	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P4_#10213_05CLOVRD 138_A	breaker	296.0	137.77	138.82	DC	6.9
161696698	242687	05JOHNMT	138.0	AEP	242734	05NEWL DN	138.0	AEP	1	AEP_P2-2_#13260_05SKIMMR 69.0_1	bus	240.0	147.25	149.01	DC	4.22
161696699	242687	05JOHNMT	138.0	AEP	242734	05NEWL DN	138.0	AEP	1	AEP_P2-2_#10163_05EDAN 2 138_2	bus	240.0	147.51	148.19	DC	3.06
161697065	242687	05JOHNMT	138.0	AEP	242734	05NEWL DN	138.0	AEP	1	AEP_P7-1_#10778	tower	240.0	147.51	148.19	DC	3.06
161697066	242687	05JOHNMT	138.0	AEP	242734	05NEWL DN	138.0	AEP	1	AEP_P7-1_#10830	tower	240.0	143.08	143.8	DC	3.24
173864869	242687	05JOHNMT	138.0	AEP	242734	05NEWL DN	138.0	AEP	1	DVP_P4-2: 3132	breaker	240.0	137.55	138.21	DC	3.02
163717866	242701	05LEESVI	138.0	AEP	314667	4ALT VST A	138.0	DVP	1	AEP_P4_#13922_05OPOS SUMCK 138_D	breaker	284.0	117.0	117.62	DC	3.33
174052280	242720	05MONETA	138.0	AEP	243892	05MEAD S8	138.0	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	409.0	100.73	101.38	DC	5.8
161696693	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	AEP_P2-2_#13260_05SKIMMR 69.0_1	bus	245.0	147.78	149.5	DC	4.22
161696694	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	AEP_P2-2_#10163_05EDAN 2 138_2	bus	245.0	144.91	145.57	DC	3.06
161697075	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	AEP_P7-1_#10778	tower	245.0	144.91	145.57	DC	3.06
161697076	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	AEP_P7-1_#10830	tower	245.0	141.56	142.26	DC	3.24
173864873	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	DVP_P4-2: 3132	breaker	245.0	137.33	137.98	DC	3.02
174052251	242775	05ROCKC AS SS	138.0	AEP	242720	05MONE TA	138.0	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	409.0	104.69	105.34	DC	5.8

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
173864957	242802	05SMITH MTN	138.0	AEP	242701	05LEESVI	138.0	AEP	1	AEP_P4_#13922_05OPOS SUMCK 138_D	breaker	255.0	114.11	114.8	DC	3.32
174052210	243892	05MEADS8	138.0	AEP	242607	05CLOVRD	138.0	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	407.0	113.83	114.48	DC	5.8
164061289	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	DVP_P2-2: BREMO B1	bus	228.0	107.14	108.05	DC	4.61
174441748	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	DVP_P4-2: 210622	breaker	228.0	107.14	108.05	DC	4.61
174441749	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	DVP_P4-2: 29822	breaker	228.0	107.1	108.01	DC	4.61
161696809	926520	AC1-123 TAP	138.0	AEP	242575	05CAMD LM	138.0	AEP	1	AEP_P2-2_#10292_05NEWLDN 138_1	bus	255.0	110.6	112.43	DC	4.68
164061199	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P2-2: BREMO B1	bus	173.0	141.21	142.41	DC	4.61
164061200	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P2-2: DOOMS B2	bus	173.0	129.05	130.38	DC	5.08
166950175	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P7-1: LN 2106-2111	tower	173.0	141.03	142.37	DC	5.13
166950176	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P7-1: LN 555-2168-A	tower	173.0	132.62	133.99	DC	5.27
173007268	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P7-1: LN 555-2168-B	tower	173.0	132.62	133.99	DC	5.27
174255660	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	DVP_P4-2: 2106T2111	breaker	173.0	141.03	142.37	DC	5.13
161696850	946590	AF1-323 TAP	138.0	AEP	242792	05SCOTSV	138.0	AEP	1	DVP_P2-2: BREMO B1	bus	167.0	102.99	104.23	DC	4.61
173864993	946590	AF1-323 TAP	138.0	AEP	242792	05SCOTSV	138.0	AEP	1	DVP_P4-2: 29822	breaker	167.0	102.93	104.17	DC	4.61

14.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
167931900	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	AEP_P1-2_#5419_105	operation	296.0	136.34	137.4	DC	6.89
167931901	242549	05BANSTR	138.0	AEP	242632	05EDAN 2	138.0	AEP	1	Base Case	operation	296.0	116.21	117.08	DC	5.71
167932137	242550	05BEARSK	138.0	AEP	940080	AE1-250 TAP	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operation	392.0	105.86	106.66	DC	6.89
168186179	242687	05JOHNMT	138.0	AEP	242734	05NEWLDN	138.0	AEP	1	Base Case	operation	167.0	180.06	181.13	DC	3.39

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 PROJE CT LOADI NG %	POST PROJE CT LOADI NG %	AC DC	MW IMPA CT
163718176	242701	05LEESVI	138.0	AEP	314667	4ALTVST A	138.0	DVP	1	Base Case	operati on	205.0	126.97	127.56	DC	2.28
163718178	242701	05LEESVI	138.0	AEP	314667	4ALTVST A	138.0	DVP	1	AEP_P2-1_242575 05CAMDL M 138 926520 AC1-123 TAP 138 1-A	operati on	284.0	116.68	117.35	DC	3.61
168186472	242720	05MONET A	138.0	AEP	243892	05MEAD S8	138.0	AEP	1	AEP_P1-2_#5366_42-A	operati on	409.0	100.73	101.37	DC	5.8
168186313	242734	05NEWLD N	138.0	AEP	242569	05BRUS HT	138.0	AEP	1	AEP_P2-1_242641 05FOREST 138 242734 05NEWLDN 138 1	operati on	207.0	116.72	117.54	DC	3.22
168186406	242734	05NEWLD N	138.0	AEP	242641	05FORES T	138.0	AEP	1	AEP_P2-1_242569 05BRUSHT 138 242734 05NEWLDN 138 1	operati on	240.0	104.03	104.59	DC	2.52
168186171	242741	05OTTER	138.0	AEP	242687	05JOHN MT	138.0	AEP	1	Base Case	operati on	167.0	186.31	187.39	DC	3.39
168186435	242775	05ROCKCA S SS	138.0	AEP	242720	05MONE TA	138.0	AEP	1	AEP_P1-2_#5366_42-A	operati on	409.0	104.67	105.31	DC	5.8
168186327	242802	05SMITH MTN	138.0	AEP	926050	AC1-083 TAP	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operati on	296.0	119.89	120.94	DC	6.89
168186338	242802	05SMITH MTN	138.0	AEP	242701	05LEESVI	138.0	AEP	1	AEP_P2-1_242575 05CAMDL M 138 926520 AC1-123 TAP 138 1-A	operati on	255.0	113.74	114.49	DC	3.6
168186339	242802	05SMITH MTN	138.0	AEP	242701	05LEESVI	138.0	AEP	1	Base Case	operati on	205.0	106.91	107.5	DC	2.27
168186484	242802	05SMITH MTN	138.0	AEP	242775	05ROCKC AS SS	138.0	AEP	1	AEP_P1-2_#5366_42-A	operati on	409.0	99.38	100.02	DC	5.8
168186369	243892	05MEADS 8	138.0	AEP	242607	05CLOVR D	138.0	AEP	1	AEP_P1-2_#5366_42-A	operati on	407.0	113.83	114.48	DC	5.8
163717999	314667	4ALTVSTA	138.0	DVP	242741	05OTTER	138.0	AEP	1	Base Case	operati on	167.0	188.23	189.31	DC	3.39
175889363	314712	3OTTER R	115.0	DVP	314666	3ALTVST A	115.0	DVP	1	DVP_P1-2: LN 556-B-C	operati on	269.779998 779	149.21	149.74	DC	2.71
169415331	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	Base Case	operati on	186.119995 117	115.86	117.1	DC	5.14
174675319	314746	4BREMO	138.0	DVP	314744	3BREMO	115.0	DVP	1	PJM_PLANT BEAR GARDEN	operati on	205.860000 61	118.84	119.96	DC	5.14
167931926	926050	AC1-083 TAP	138.0	AEP	242550	05BEARS K	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operati on	296.0	140.23	141.28	DC	6.89
167931928	926050	AC1-083 TAP	138.0	AEP	242550	05BEARS K	138.0	AEP	1	Base Case	operati on	296.0	109.11	109.98	DC	5.71
169682442	926520	AC1-123 TAP	138.0	AEP	242575	05CAMD LM	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	operati on	255.0	111.55	112.27	DC	3.49
169682444	926520	AC1-123 TAP	138.0	AEP	242575	05CAMD LM	138.0	AEP	1	Base Case	operati on	205.0	99.68	100.68	DC	3.92

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 PROJE CT LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
169415220	938820	AE1-108 TAP	138.0	DVP	314746	4BREMO	138.0	DVP	1	Base Case	operation	156.979995728	137.36	138.84	DC	5.14
169682397	940080	AE1-250 TAP	138.0	AEP	242549	05BANSTR	138.0	AEP	1	AEP_P2-1_242607 05CLOVRD 138243892 05MEADS8 1381	operation	392.0	116.48	117.27	DC	6.89
169682399	940080	AE1-250 TAP	138.0	AEP	242549	05BANSTR	138.0	AEP	1	Base Case	operation	335.0	105.13	105.9	DC	5.71
175077535	946590	AF1-323 TAP	138.0	AEP	242792	05SCOTSV	138.0	AEP	1	AEP_P1-3_#1372_05JOSHUA 765_1	operation	167.0	93.45	100.22	DC	11.31

14.5 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".

14.5.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
174052289	242802	05SMITHMTN	AEP	242775	05ROCKCASS	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	409.0	99.38	100.02	DC	5.8

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	3.7207	50/50	3.7207
246844	05SMG2	10.1141	50/50	10.1141
246845	05SMG3	6.3410	50/50	6.3410
246846	05SMG4	9.9569	50/50	9.9569
246847	05SMG5	3.8779	50/50	3.8779
247284	05LEESVG	2.0136	50/50	2.0136
315156	1HALLBR1	1.3319	50/50	1.3319
925661	AC1-042 C	2.7845	50/50	2.7845
925662	AC1-042 E	4.5432	50/50	4.5432
925997	AC1-075 E	1.7025	Adder	2.0
926024	AC1-080 E	0.5649	Adder	0.66
926051	AC1-083 C O1	12.6221	50/50	12.6221
926052	AC1-083 E O1	20.5939	50/50	20.5939
926521	AC1-123 C O1	2.0526	50/50	2.0526
926522	AC1-123 E O1	6.1217	50/50	6.1217
926645	AC1-145 C	0.5230	50/50	0.5230
926646	AC1-145 E	2.9747	50/50	2.9747
933941	AD1-017 C	2.5244	50/50	2.5244
933942	AD1-017 E	4.1188	50/50	4.1188
935241	AD1-161 C	1.8626	Adder	2.19
935242	AD1-161 E	1.5296	Adder	1.8
939941	AE1-230 C	1.2562	50/50	1.2562
939942	AE1-230 E	2.2332	50/50	2.2332
940081	AE1-250 C	29.8944	50/50	29.8944
940082	AE1-250 E	19.9296	50/50	19.9296
941801	AE2-185 C	6.2809	50/50	6.2809
941802	AE2-185 E	4.1873	50/50	4.1873
941821	AE2-187 C	6.2809	50/50	6.2809
941822	AE2-187 E	2.7915	50/50	2.7915
942671	AE2-283 C	6.9090	50/50	6.9090
942672	AE2-283 E	3.6290	50/50	3.6290
942751	AE2-291 C	6.9132	50/50	6.9132
942752	AE2-291 E	4.6088	50/50	4.6088
942761	AE2-292 C O1	8.6076	50/50	8.6076
942762	AE2-292 E O1	5.7384	50/50	5.7384
945081	AF1-173	2.4339	50/50	2.4339
961121	AF2-403	1.3958	50/50	1.3958
962741	AG1-123 C O2	1.2067	Adder	2.68
962742	AG1-123 E O2	0.8408	Adder	1.87
962751	AG1-124 C O2	1.4878	Adder	3.3
962752	AG1-124 E O2	1.0382	Adder	2.3
963601	AG1-209 C	0.4885	50/50	0.4885

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
963602	AG1-209 E	0.7328	50/50	0.7328
964141	AG1-275 C	2.0936	50/50	2.0936
964142	AG1-275 E	1.3958	50/50	1.3958
964151	AG1-276 C	2.0936	50/50	2.0936
964152	AG1-276 E	1.3958	50/50	1.3958
964251	AG1-286 C	0.8191	50/50	0.8191
964252	AG1-286 E	0.5461	50/50	0.5461
964471	AG1-310 C	0.3026	Adder	0.67
964472	AG1-310 E	0.1491	Adder	0.33
964531	AG1-316 C O2	2.0920	Adder	4.64
964532	AG1-316 E O2	0.5230	Adder	1.16
966251	AG1-494 C	0.4966	Adder	1.1
966252	AG1-494 E	0.7449	Adder	1.65
966691	AG1-539 C	3.6147	50/50	3.6147
966692	AG1-539 E	4.8573	50/50	4.8573
966761	AG1-547 C	5.6773	50/50	5.6773
966762	AG1-547 E	3.0462	50/50	3.0462
CPL	CPL	0.3344	Confirmed LTF	0.3344
CALDERWOOD	CALDERWOOD	0.0318	Confirmed LTF	0.0318
NY	NY	0.0691	Confirmed LTF	0.0691
PRAIRIE	PRAIRIE	0.4779	Confirmed LTF	0.4779
O-066	O-066	0.7403	Confirmed LTF	0.7403
CBM-S2	CBM-S2	2.7353	Confirmed LTF	2.7353
CHEOAH	CHEOAH	0.0275	Confirmed LTF	0.0275
COTTONWOOD	COTTONWOOD	0.2163	Confirmed LTF	0.2163
G-007	G-007	0.1145	Confirmed LTF	0.1145
GIBSON	GIBSON	0.1256	Confirmed LTF	0.1256
BLUEG	BLUEG	0.4218	Confirmed LTF	0.4218
TRIMBLE	TRIMBLE	0.1363	Confirmed LTF	0.1363

14.5.2 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
161697085	242549	05BANSTR	AEP	242632	05EDAN 2	AEP	1	AEP_P7- 1_#10830	tower	296.0	138.22	139.19	DC	6.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
244012	05PINNACLE	-1.0308	Adder	-1.21
246843	05SMG1	3.1825	50/50	3.1825
246844	05SMG2	8.6510	50/50	8.6510
246845	05SMG3	5.4237	50/50	5.4237
246846	05SMG4	8.5165	50/50	8.5165
246847	05SMG5	3.3170	50/50	3.3170
247284	05LEESVG	1.7344	50/50	1.7344
315156	1HALLBR1	1.1514	50/50	1.1514
925661	AC1-042 C	2.4318	50/50	2.4318
925662	AC1-042 E	3.9677	50/50	3.9677
925997	AC1-075 E	1.2021	Adder	1.41
926024	AC1-080 E	0.3988	Adder	0.47
926051	AC1-083 C O1	18.0800	50/50	18.0800
926052	AC1-083 E O1	29.4990	50/50	29.4990
926521	AC1-123 C O1	1.8103	50/50	1.8103
926522	AC1-123 E O1	5.3990	50/50	5.3990
926645	AC1-145 C	0.4567	50/50	0.4567
926646	AC1-145 E	2.5979	50/50	2.5979
933941	AD1-017 C	3.6160	50/50	3.6160
933942	AD1-017 E	5.8998	50/50	5.8998
935241	AD1-161 C	2.0472	Adder	2.41
935242	AD1-161 E	1.6811	Adder	1.98
938451	AE1-064 C	16.0187	50/50	16.0187
938452	AE1-064 E	8.2831	50/50	8.2831
939011	AE1-130 C	8.0506	50/50	8.0506
939012	AE1-130 E	4.0326	50/50	4.0326
939941	AE1-230 C	1.0971	50/50	1.0971
939942	AE1-230 E	1.9503	50/50	1.9503
940081	AE1-250 C	55.6443	50/50	55.6443
940082	AE1-250 E	37.0962	50/50	37.0962
941801	AE2-185 C	5.4853	50/50	5.4853
941802	AE2-185 E	3.6569	50/50	3.6569
941821	AE2-187 C	5.4853	50/50	5.4853
941822	AE2-187 E	2.4379	50/50	2.4379
942671	AE2-283 C	6.0339	50/50	6.0339
942672	AE2-283 E	3.1693	50/50	3.1693
942751	AE2-291 C	4.5476	Adder	5.35
942752	AE2-291 E	3.0317	Adder	3.57
942761	AE2-292 C O1	5.6622	Adder	6.66
942762	AE2-292 E O1	3.7748	Adder	4.44
945081	AF1-173	2.1256	50/50	2.1256
958131	AF2-107 C	1.4990	Adder	1.76

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958132	AF2-107 E	0.8215	Adder	0.97
961121	AF2-403	1.2190	50/50	1.2190
962741	AG1-123 C O2	1.3783	Adder	3.06
962742	AG1-123 E O2	0.9605	Adder	2.13
962751	AG1-124 C O2	1.7364	Adder	3.85
962752	AG1-124 E O2	1.2117	Adder	2.69
963601	AG1-209 C	0.4266	50/50	0.4266
963602	AG1-209 E	0.6400	50/50	0.6400
964141	AG1-275 C	1.8284	50/50	1.8284
964142	AG1-275 E	1.2190	50/50	1.2190
964151	AG1-276 C	1.8284	50/50	1.8284
964152	AG1-276 E	1.2190	50/50	1.2190
964251	AG1-286 C	0.7535	50/50	0.7535
964252	AG1-286 E	0.5024	50/50	0.5024
964531	AG1-316 C O2	2.2994	Adder	5.1
964532	AG1-316 E O2	0.5748	Adder	1.28
966251	AG1-494 C	0.5765	Adder	1.28
966252	AG1-494 E	0.8647	Adder	1.92
966691	AG1-539 C	1.2602	Adder	2.8
966692	AG1-539 E	1.6935	Adder	3.76
966703	AG1-540 BAT	2.1728	Merchant Transmission	2.1728
966761	AG1-547 C	4.9581	50/50	4.9581
966762	AG1-547 E	2.6604	50/50	2.6604
CALDERWOOD	CALDERWOOD	0.4001	Confirmed LTF	0.4001
NY	NY	0.0415	Confirmed LTF	0.0415
PRAIRIE	PRAIRIE	0.8111	Confirmed LTF	0.8111
O-066	O-066	0.6259	Confirmed LTF	0.6259
CHEOAH	CHEOAH	0.4199	Confirmed LTF	0.4199
COTTONWOOD	COTTONWOOD	1.3482	Confirmed LTF	1.3482
G-007	G-007	0.0987	Confirmed LTF	0.0987
HAMLET	HAMLET	1.3427	Confirmed LTF	1.3427
GIBSON	GIBSON	0.0759	Confirmed LTF	0.0759
BLUEG	BLUEG	0.1701	Confirmed LTF	0.1701
TRIMBLE	TRIMBLE	0.0501	Confirmed LTF	0.0501
CATAWBA	CATAWBA	0.6416	Confirmed LTF	0.6416

14.5.3 Index 3

ID	FROM BUS#	FROM BUS	FRO M BUS AREA	TO BUS#	TO BUS	TO BUS ARE A	CK T ID	CONT NAME	Type	Ratin g MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
161696698	242687	05JOHNM T	AEP	24273 4	05NEWLD N	AEP	1	AEP_P2-2_#13260_05SKIMM R 69.0_1	bus	240.0	147.25	149.01	DC	4.22

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.1693	50/50	1.1693
246844	05SMG2	3.1786	50/50	3.1786
246845	05SMG3	1.9928	50/50	1.9928
246846	05SMG4	3.1292	50/50	3.1292
246847	05SMG5	1.2187	50/50	1.2187
247284	05LEESVG	1.8564	50/50	1.8564
315156	1HALLBR1	2.9223	50/50	2.9223
316118	AC1-105 C	1.8331	Adder	2.16
316123	AC1-075 C	1.2269	50/50	1.2269
925661	AC1-042 C	5.9959	50/50	5.9959
925662	AC1-042 E	9.7827	50/50	9.7827
925997	AC1-075 E	4.4060	50/50	4.4060
926023	AC1-080 C	0.4100	50/50	0.4100
926024	AC1-080 E	1.4619	50/50	1.4619
926051	AC1-083 C O1	2.5475	Adder	3.0
926052	AC1-083 E O1	4.1564	Adder	4.89
926274	AC1-105 E	0.9006	Adder	1.06
926645	AC1-145 C	1.1261	50/50	1.1261
926646	AC1-145 E	6.4053	50/50	6.4053
927261	AC1-222 C	1.9259	Adder	2.27
927262	AC1-222 E	1.8334	Adder	2.16
933941	AD1-017 C	0.5095	Adder	0.6
933942	AD1-017 E	0.8313	Adder	0.98
934311	AD1-055 C	1.3372	Adder	1.57
934312	AD1-055 E	0.3448	Adder	0.41
938451	AE1-064 C	4.7778	Adder	5.62
938452	AE1-064 E	2.4705	Adder	2.91
939941	AE1-230 C	2.7049	50/50	2.7049
939942	AE1-230 E	4.8087	50/50	4.8087
941801	AE2-185 C	13.5245	50/50	13.5245
941802	AE2-185 E	9.0163	50/50	9.0163
941821	AE2-187 C	13.5245	50/50	13.5245
941822	AE2-187 E	6.0109	50/50	6.0109
942671	AE2-283 C	14.8769	50/50	14.8769
942672	AE2-283 E	7.8141	50/50	7.8141
942751	AE2-291 C	15.1898	50/50	15.1898
942752	AE2-291 E	10.1266	50/50	10.1266
942761	AE2-292 C O1	18.9128	50/50	18.9128
942762	AE2-292 E O1	12.6086	50/50	12.6086
943901	AF1-058 C	0.7117	Adder	0.84
943902	AF1-058 E	0.4744	Adder	0.56

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945081	AF1-173	5.2407	50/50	5.2407
960061	AF2-297 C	2.8466	Adder	3.35
960062	AF2-297 E	1.8977	Adder	2.23
961121	AF2-403	3.0054	50/50	3.0054
963601	AG1-209 C	1.0519	50/50	1.0519
963602	AG1-209 E	1.5779	50/50	1.5779
964141	AG1-275 C	4.5082	50/50	4.5082
964142	AG1-275 E	3.0054	50/50	3.0054
964151	AG1-276 C	4.5082	50/50	4.5082
964152	AG1-276 E	3.0054	50/50	3.0054
964251	AG1-286 C	3.3401	50/50	3.3401
964252	AG1-286 E	2.2268	50/50	2.2268
964261	AG1-287 C	0.2829	Adder	0.63
964262	AG1-287 E	0.1886	Adder	0.42
964471	AG1-310 C	1.4850	50/50	1.4850
964472	AG1-310 E	0.7314	50/50	0.7314
964533	AG1-316 BAT	4.2156	50/50	4.2156
966253	AG1-494 BAT	2.5943	Merchant Transmission	2.5943
966691	AG1-539 C	7.9424	50/50	7.9424
966692	AG1-539 E	10.6726	50/50	10.6726
966761	AG1-547 C	12.2246	50/50	12.2246
966762	AG1-547 E	6.5594	50/50	6.5594
CPLE	CPLE	0.9111	Confirmed LTF	0.9111
NY	NY	0.0210	Confirmed LTF	0.0210
PRAIRIE	PRAIRIE	0.4288	Confirmed LTF	0.4288
O-066	O-066	0.0673	Confirmed LTF	0.0673
CBM-S2	CBM-S2	8.1014	Confirmed LTF	8.1014
COTTONWOOD	COTTONWOOD	0.0105	Confirmed LTF	0.0105
G-007	G-007	0.0084	Confirmed LTF	0.0084
GIBSON	GIBSON	0.1381	Confirmed LTF	0.1381
BLUEG	BLUEG	0.4826	Confirmed LTF	0.4826
TRIMBLE	TRIMBLE	0.1564	Confirmed LTF	0.1564

14.5.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
163717866	242701	05LEES VI	AEP	314667	4ALTVST A	DVP	1	AEP_P4_#13922_05OPOSSUM CK 138_D	breaker	284.0	117.0	117.62	DC	3.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	2.7681	50/50	2.7681
246844	05SMG2	7.5247	50/50	7.5247
246845	05SMG3	4.7175	50/50	4.7175
246846	05SMG4	7.4077	50/50	7.4077
246847	05SMG5	2.8851	50/50	2.8851
247284	05LEESVG	3.3896	50/50	3.3896
925661	AC1-042 C	-5.0764	Adder	-5.97
926051	AC1-083 C O1	6.8366	50/50	6.8366
926052	AC1-083 E O1	11.1544	50/50	11.1544
926521	AC1-123 C O1	2.1212	50/50	2.1212
926522	AC1-123 E O1	6.3263	50/50	6.3263
927261	AC1-222 C	-1.6767	Adder	-1.97
933941	AD1-017 C	1.3673	50/50	1.3673
933942	AD1-017 E	2.2309	50/50	2.2309
934311	AD1-055 C	-1.1642	Adder	-1.37
938451	AE1-064 C	13.7568	50/50	13.7568
938452	AE1-064 E	7.1135	50/50	7.1135
939011	AE1-130 C	6.5669	50/50	6.5669
939012	AE1-130 E	3.2894	50/50	3.2894
939943	AE1-230 BAT	2.9936	50/50	2.9936
940081	AE1-250 C	11.6955	50/50	11.6955
940082	AE1-250 E	7.7970	50/50	7.7970
961122	AF2-403 BAT	7.4840	50/50	7.4840
961131	AF2-404 BAT	7.4840	50/50	7.4840
963603	AG1-209 BAT	2.6194	50/50	2.6194
964533	AG1-316 BAT	1.7630	Merchant Transmission	1.7630
966253	AG1-494 BAT	2.0341	Merchant Transmission	2.0341
966693	AG1-539 BAT	17.7615	50/50	17.7615
966763	AG1-547 BAT	4.4904	50/50	4.4904
WEC	WEC	0.0410	Confirmed LTF	0.0410
LGEE	LGEE	0.0898	Confirmed LTF	0.0898
CPL	CPL	0.1822	Confirmed LTF	0.1822
CBM-W2	CBM-W2	1.4515	Confirmed LTF	1.4515
NY	NY	0.0807	Confirmed LTF	0.0807
TVA	TVA	0.2562	Confirmed LTF	0.2562
O-066	O-066	1.1306	Confirmed LTF	1.1306
SIGE	SIGE	0.0327	Confirmed LTF	0.0327
CBM-S2	CBM-S2	2.6831	Confirmed LTF	2.6831
CBM-S1	CBM-S1	0.0669	Confirmed LTF	0.0669
G-007	G-007	0.1774	Confirmed LTF	0.1774
MEC	MEC	0.2256	Confirmed LTF	0.2256
LAGN	LAGN	0.3097	Confirmed LTF	0.3097

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CBM-W1	CBM-W1	1.7104	Confirmed LTF	1.7104

14.5.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	ACID C	MW IMPACT
174052280	242720	05MONETA	AEP	243892	05MEADS8	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	409.0	100.73	101.38	DC	5.8

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	3.7207	50/50	3.7207
246844	05SMG2	10.1141	50/50	10.1141
246845	05SMG3	6.3410	50/50	6.3410
246846	05SMG4	9.9569	50/50	9.9569
246847	05SMG5	3.8779	50/50	3.8779
247284	05LEESVG	2.0136	50/50	2.0136
315156	1HALLBR1	1.3319	50/50	1.3319
925661	AC1-042 C	2.7845	50/50	2.7845
925662	AC1-042 E	4.5432	50/50	4.5432
925997	AC1-075 E	1.7025	Adder	2.0
926024	AC1-080 E	0.5649	Adder	0.66
926051	AC1-083 C O1	12.6221	50/50	12.6221
926052	AC1-083 E O1	20.5939	50/50	20.5939
926521	AC1-123 C O1	2.0526	50/50	2.0526
926522	AC1-123 E O1	6.1217	50/50	6.1217
926645	AC1-145 C	0.5230	50/50	0.5230
926646	AC1-145 E	2.9747	50/50	2.9747
933941	AD1-017 C	2.5244	50/50	2.5244
933942	AD1-017 E	4.1188	50/50	4.1188
935241	AD1-161 C	1.8626	Adder	2.19
935242	AD1-161 E	1.5296	Adder	1.8
938451	AE1-064 C	30.1491	50/50	30.1491
938452	AE1-064 E	15.5897	50/50	15.5897
939941	AE1-230 C	1.2562	50/50	1.2562
939942	AE1-230 E	2.2332	50/50	2.2332
940081	AE1-250 C	29.8944	50/50	29.8944
940082	AE1-250 E	19.9296	50/50	19.9296
941801	AE2-185 C	6.2809	50/50	6.2809
941802	AE2-185 E	4.1873	50/50	4.1873
941821	AE2-187 C	6.2809	50/50	6.2809
941822	AE2-187 E	2.7915	50/50	2.7915
942671	AE2-283 C	6.9090	50/50	6.9090
942672	AE2-283 E	3.6290	50/50	3.6290
942751	AE2-291 C	6.9132	50/50	6.9132
942752	AE2-291 E	4.6088	50/50	4.6088
942761	AE2-292 C O1	8.6076	50/50	8.6076
942762	AE2-292 E O1	5.7384	50/50	5.7384
945081	AF1-173	2.4339	50/50	2.4339
961121	AF2-403	1.3958	50/50	1.3958
962741	AG1-123 C O2	1.2067	Adder	2.68
962742	AG1-123 E O2	0.8408	Adder	1.87
962751	AG1-124 C O2	1.4878	Adder	3.3

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
962752	AG1-124 E O2	1.0382	Adder	2.3
963601	AG1-209 C	0.4885	50/50	0.4885
963602	AG1-209 E	0.7328	50/50	0.7328
964141	AG1-275 C	2.0936	50/50	2.0936
964142	AG1-275 E	1.3958	50/50	1.3958
964151	AG1-276 C	2.0936	50/50	2.0936
964152	AG1-276 E	1.3958	50/50	1.3958
964251	AG1-286 C	0.8191	50/50	0.8191
964252	AG1-286 E	0.5461	50/50	0.5461
964471	AG1-310 C	0.3026	Adder	0.67
964472	AG1-310 E	0.1491	Adder	0.33
964531	AG1-316 C O2	2.0920	Adder	4.64
964532	AG1-316 E O2	0.5230	Adder	1.16
966251	AG1-494 C	0.4966	Adder	1.1
966252	AG1-494 E	0.7449	Adder	1.65
966691	AG1-539 C	3.6147	50/50	3.6147
966692	AG1-539 E	4.8573	50/50	4.8573
966761	AG1-547 C	5.6773	50/50	5.6773
966762	AG1-547 E	3.0462	50/50	3.0462
CPL	CPL	0.3344	Confirmed LTF	0.3344
CALDERWOOD	CALDERWOOD	0.0318	Confirmed LTF	0.0318
NY	NY	0.0691	Confirmed LTF	0.0691
PRAIRIE	PRAIRIE	0.4779	Confirmed LTF	0.4779
O-066	O-066	0.7403	Confirmed LTF	0.7403
CBM-S2	CBM-S2	2.7353	Confirmed LTF	2.7353
CHEOAH	CHEOAH	0.0275	Confirmed LTF	0.0275
COTTONWOOD	COTTONWOOD	0.2163	Confirmed LTF	0.2163
G-007	G-007	0.1145	Confirmed LTF	0.1145
GIBSON	GIBSON	0.1256	Confirmed LTF	0.1256
BLUEG	BLUEG	0.4218	Confirmed LTF	0.4218
TRIMBLE	TRIMBLE	0.1363	Confirmed LTF	0.1363

14.5.6 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
161696693	242741	05OTTER	AEP	242687	05JOHNMT	AEP	1	AEP_P2-2_#13260_05SKIMMR69.0_1	bus	245.0	147.78	149.5	DC	4.22

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.1693	50/50	1.1693
246844	05SMG2	3.1786	50/50	3.1786
246845	05SMG3	1.9928	50/50	1.9928
246846	05SMG4	3.1292	50/50	3.1292
246847	05SMG5	1.2187	50/50	1.2187
247284	05LEESVG	1.8564	50/50	1.8564
315156	1HALLBR1	2.9223	50/50	2.9223
316118	AC1-105 C	1.8331	Adder	2.16
316123	AC1-075 C	1.2269	50/50	1.2269
925661	AC1-042 C	5.9959	50/50	5.9959
925662	AC1-042 E	9.7827	50/50	9.7827
925997	AC1-075 E	4.4060	50/50	4.4060
926023	AC1-080 C	0.4100	50/50	0.4100
926024	AC1-080 E	1.4619	50/50	1.4619
926051	AC1-083 C O1	2.5475	Adder	3.0
926052	AC1-083 E O1	4.1564	Adder	4.89
926274	AC1-105 E	0.9006	Adder	1.06
926645	AC1-145 C	1.1261	50/50	1.1261
926646	AC1-145 E	6.4053	50/50	6.4053
927261	AC1-222 C	1.9259	Adder	2.27
927262	AC1-222 E	1.8334	Adder	2.16
933941	AD1-017 C	0.5095	Adder	0.6
933942	AD1-017 E	0.8313	Adder	0.98
934311	AD1-055 C	1.3372	Adder	1.57
934312	AD1-055 E	0.3448	Adder	0.41
938451	AE1-064 C	4.7778	Adder	5.62
938452	AE1-064 E	2.4705	Adder	2.91
939941	AE1-230 C	2.7049	50/50	2.7049
939942	AE1-230 E	4.8087	50/50	4.8087
940081	AE1-250 C	4.5831	Adder	5.39
940082	AE1-250 E	3.0554	Adder	3.59
941801	AE2-185 C	13.5245	50/50	13.5245
941802	AE2-185 E	9.0163	50/50	9.0163
941821	AE2-187 C	13.5245	50/50	13.5245
941822	AE2-187 E	6.0109	50/50	6.0109
942671	AE2-283 C	14.8769	50/50	14.8769
942672	AE2-283 E	7.8141	50/50	7.8141
942751	AE2-291 C	15.1898	50/50	15.1898
942752	AE2-291 E	10.1266	50/50	10.1266
942761	AE2-292 C O1	18.9128	50/50	18.9128
942762	AE2-292 E O1	12.6086	50/50	12.6086

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943901	AF1-058 C	0.7117	Adder	0.84
943902	AF1-058 E	0.4744	Adder	0.56
945081	AF1-173	5.2407	50/50	5.2407
960061	AF2-297 C	2.8466	Adder	3.35
960062	AF2-297 E	1.8977	Adder	2.23
961121	AF2-403	3.0054	50/50	3.0054
963601	AG1-209 C	1.0519	50/50	1.0519
963602	AG1-209 E	1.5779	50/50	1.5779
964141	AG1-275 C	4.5082	50/50	4.5082
964142	AG1-275 E	3.0054	50/50	3.0054
964151	AG1-276 C	4.5082	50/50	4.5082
964152	AG1-276 E	3.0054	50/50	3.0054
964261	AG1-287 C	0.2829	Adder	0.63
964262	AG1-287 E	0.1886	Adder	0.42
964471	AG1-310 C	1.4850	50/50	1.4850
964472	AG1-310 E	0.7314	50/50	0.7314
964533	AG1-316 BAT	4.2156	50/50	4.2156
966253	AG1-494 BAT	2.5943	Merchant Transmission	2.5943
966691	AG1-539 C	7.9424	50/50	7.9424
966692	AG1-539 E	10.6726	50/50	10.6726
966761	AG1-547 C	12.2246	50/50	12.2246
966762	AG1-547 E	6.5594	50/50	6.5594
CPLE	CPLE	0.9111	Confirmed LTF	0.9111
NY	NY	0.0210	Confirmed LTF	0.0210
PRAIRIE	PRAIRIE	0.4288	Confirmed LTF	0.4288
O-066	O-066	0.0673	Confirmed LTF	0.0673
CBM-S2	CBM-S2	8.1014	Confirmed LTF	8.1014
COTTONWOOD	COTTONWOOD	0.0105	Confirmed LTF	0.0105
G-007	G-007	0.0084	Confirmed LTF	0.0084
GIBSON	GIBSON	0.1381	Confirmed LTF	0.1381
BLUEG	BLUEG	0.4826	Confirmed LTF	0.4826
TRIMBLE	TRIMBLE	0.1564	Confirmed LTF	0.1564

14.5.7 Index 7

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	ACID C	MW IMPACT
174052251	242775	05ROCKCASS	AEP	242720	05MONETA	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	409.0	104.69	105.34	DC	5.8

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	3.7207	50/50	3.7207
246844	05SMG2	10.1141	50/50	10.1141
246845	05SMG3	6.3410	50/50	6.3410
246846	05SMG4	9.9569	50/50	9.9569
246847	05SMG5	3.8779	50/50	3.8779
247284	05LEESVG	2.0136	50/50	2.0136
315156	1HALLBR1	1.3319	50/50	1.3319
925661	AC1-042 C	2.7845	50/50	2.7845
925662	AC1-042 E	4.5432	50/50	4.5432
925997	AC1-075 E	1.7025	Adder	2.0
926024	AC1-080 E	0.5649	Adder	0.66
926051	AC1-083 C O1	12.6221	50/50	12.6221
926052	AC1-083 E O1	20.5939	50/50	20.5939
926521	AC1-123 C O1	2.0526	50/50	2.0526
926522	AC1-123 E O1	6.1217	50/50	6.1217
926645	AC1-145 C	0.5230	50/50	0.5230
926646	AC1-145 E	2.9747	50/50	2.9747
933941	AD1-017 C	2.5244	50/50	2.5244
933942	AD1-017 E	4.1188	50/50	4.1188
935241	AD1-161 C	1.8626	Adder	2.19
935242	AD1-161 E	1.5296	Adder	1.8
938451	AE1-064 C	30.1491	50/50	30.1491
938452	AE1-064 E	15.5897	50/50	15.5897
939941	AE1-230 C	1.2562	50/50	1.2562
939942	AE1-230 E	2.2332	50/50	2.2332
940081	AE1-250 C	29.8944	50/50	29.8944
940082	AE1-250 E	19.9296	50/50	19.9296
941801	AE2-185 C	6.2809	50/50	6.2809
941802	AE2-185 E	4.1873	50/50	4.1873
941821	AE2-187 C	6.2809	50/50	6.2809
941822	AE2-187 E	2.7915	50/50	2.7915
942671	AE2-283 C	6.9090	50/50	6.9090
942672	AE2-283 E	3.6290	50/50	3.6290
942751	AE2-291 C	6.9132	50/50	6.9132
942752	AE2-291 E	4.6088	50/50	4.6088
942761	AE2-292 C O1	8.6076	50/50	8.6076
942762	AE2-292 E O1	5.7384	50/50	5.7384
945081	AF1-173	2.4339	50/50	2.4339
961121	AF2-403	1.3958	50/50	1.3958
962741	AG1-123 C O2	1.2067	Adder	2.68
962742	AG1-123 E O2	0.8408	Adder	1.87
962751	AG1-124 C O2	1.4878	Adder	3.3

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
962752	AG1-124 E O2	1.0382	Adder	2.3
963601	AG1-209 C	0.4885	50/50	0.4885
963602	AG1-209 E	0.7328	50/50	0.7328
964141	AG1-275 C	2.0936	50/50	2.0936
964142	AG1-275 E	1.3958	50/50	1.3958
964151	AG1-276 C	2.0936	50/50	2.0936
964152	AG1-276 E	1.3958	50/50	1.3958
964251	AG1-286 C	0.8191	50/50	0.8191
964252	AG1-286 E	0.5461	50/50	0.5461
964471	AG1-310 C	0.3026	Adder	0.67
964472	AG1-310 E	0.1491	Adder	0.33
964531	AG1-316 C O2	2.0920	Adder	4.64
964532	AG1-316 E O2	0.5230	Adder	1.16
966251	AG1-494 C	0.4966	Adder	1.1
966252	AG1-494 E	0.7449	Adder	1.65
966691	AG1-539 C	3.6147	50/50	3.6147
966692	AG1-539 E	4.8573	50/50	4.8573
966761	AG1-547 C	5.6773	50/50	5.6773
966762	AG1-547 E	3.0462	50/50	3.0462
CPL	CPL	0.3344	Confirmed LTF	0.3344
CALDERWOOD	CALDERWOOD	0.0318	Confirmed LTF	0.0318
NY	NY	0.0691	Confirmed LTF	0.0691
PRAIRIE	PRAIRIE	0.4779	Confirmed LTF	0.4779
O-066	O-066	0.7403	Confirmed LTF	0.7403
CBM-S2	CBM-S2	2.7353	Confirmed LTF	2.7353
CHEOAH	CHEOAH	0.0275	Confirmed LTF	0.0275
COTTONWOOD	COTTONWOOD	0.2163	Confirmed LTF	0.2163
G-007	G-007	0.1145	Confirmed LTF	0.1145
GIBSON	GIBSON	0.1256	Confirmed LTF	0.1256
BLUEG	BLUEG	0.4218	Confirmed LTF	0.4218
TRIMBLE	TRIMBLE	0.1363	Confirmed LTF	0.1363

14.5.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC/D C	MW IMPAC T
173864957	242802	05SMITHMTN	AEP	242701	05LEESVI	AEP	1	AEP_P4_#13922_05OPOSSU MCK 138_D	breaker	255.0	114.11	114.8	DC	3.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	2.7711	50/50	2.7711
246844	05SMG2	7.5326	50/50	7.5326
246845	05SMG3	4.7225	50/50	4.7225
246846	05SMG4	7.4155	50/50	7.4155
246847	05SMG5	2.8881	50/50	2.8881
925661	AC1-042 C	-5.0729	Adder	-5.97
926051	AC1-083 C O1	6.8468	50/50	6.8468
926052	AC1-083 E O1	11.1712	50/50	11.1712
926521	AC1-123 C O1	2.1235	50/50	2.1235
926522	AC1-123 E O1	6.3332	50/50	6.3332
927261	AC1-222 C	-1.6715	Adder	-1.97
933941	AD1-017 C	1.3694	50/50	1.3694
933942	AD1-017 E	2.2342	50/50	2.2342
934311	AD1-055 C	-1.1605	Adder	-1.37
938451	AE1-064 C	13.7743	50/50	13.7743
938452	AE1-064 E	7.1225	50/50	7.1225
939011	AE1-130 C	6.5813	50/50	6.5813
939012	AE1-130 E	3.2966	50/50	3.2966
939943	AE1-230 BAT	2.9915	50/50	2.9915
940081	AE1-250 C	11.7198	50/50	11.7198
940082	AE1-250 E	7.8132	50/50	7.8132
961122	AF2-403 BAT	7.4788	50/50	7.4788
961131	AF2-404 BAT	7.4788	50/50	7.4788
963603	AG1-209 BAT	2.6176	50/50	2.6176
964533	AG1-316 BAT	1.7575	Merchant Transmission	1.7575
966253	AG1-494 BAT	2.0272	Merchant Transmission	2.0272
966693	AG1-539 BAT	17.7420	50/50	17.7420
966763	AG1-547 BAT	4.4873	50/50	4.4873
WEC	WEC	0.0491	Confirmed LTF	0.0491
LGEE	LGEE	0.1062	Confirmed LTF	0.1062
CPL	CPL	0.2000	Confirmed LTF	0.2000
CBM-W2	CBM-W2	1.6845	Confirmed LTF	1.6845
NY	NY	0.0664	Confirmed LTF	0.0664
TVA	TVA	0.2926	Confirmed LTF	0.2926
O-066	O-066	0.9557	Confirmed LTF	0.9557
SIGE	SIGE	0.0327	Confirmed LTF	0.0327
CBM-S2	CBM-S2	2.9545	Confirmed LTF	2.9545
CBM-S1	CBM-S1	0.0768	Confirmed LTF	0.0768
G-007	G-007	0.1501	Confirmed LTF	0.1501
MEC	MEC	0.2670	Confirmed LTF	0.2670
LAGN	LAGN	0.3553	Confirmed LTF	0.3553

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CBM-W1	CBM-W1	2.0750	Confirmed LTF	2.0750

14.5.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	ACID C	MW IMPACT
174052210	243892	05MEADS8	AEP	242607	05CLOVRD	AEP	1	AEP_P4_#10164_05EDAN 2 138_M	breaker	407.0	113.83	114.48	DC	5.8

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	3.7207	50/50	3.7207
246844	05SMG2	10.1141	50/50	10.1141
246845	05SMG3	6.3410	50/50	6.3410
246846	05SMG4	9.9569	50/50	9.9569
246847	05SMG5	3.8779	50/50	3.8779
247284	05LEESVG	2.0136	50/50	2.0136
315156	1HALLBR1	1.3319	50/50	1.3319
925661	AC1-042 C	2.7845	50/50	2.7845
925662	AC1-042 E	4.5432	50/50	4.5432
925997	AC1-075 E	1.7025	Adder	2.0
926024	AC1-080 E	0.5649	Adder	0.66
926051	AC1-083 C O1	12.6221	50/50	12.6221
926052	AC1-083 E O1	20.5939	50/50	20.5939
926521	AC1-123 C O1	2.0526	50/50	2.0526
926522	AC1-123 E O1	6.1217	50/50	6.1217
926645	AC1-145 C	0.5230	50/50	0.5230
926646	AC1-145 E	2.9747	50/50	2.9747
933941	AD1-017 C	2.5244	50/50	2.5244
933942	AD1-017 E	4.1188	50/50	4.1188
935241	AD1-161 C	1.8626	Adder	2.19
935242	AD1-161 E	1.5296	Adder	1.8
938451	AE1-064 C	30.1491	50/50	30.1491
938452	AE1-064 E	15.5897	50/50	15.5897
939011	AE1-130 C	37.6178	50/50	37.6178
939012	AE1-130 E	18.8429	50/50	18.8429
939941	AE1-230 C	1.2562	50/50	1.2562
939942	AE1-230 E	2.2332	50/50	2.2332
940081	AE1-250 C	29.8944	50/50	29.8944
940082	AE1-250 E	19.9296	50/50	19.9296
941801	AE2-185 C	6.2809	50/50	6.2809
941802	AE2-185 E	4.1873	50/50	4.1873
941821	AE2-187 C	6.2809	50/50	6.2809
941822	AE2-187 E	2.7915	50/50	2.7915
942671	AE2-283 C	6.9090	50/50	6.9090
942672	AE2-283 E	3.6290	50/50	3.6290
942751	AE2-291 C	6.9132	50/50	6.9132
942752	AE2-291 E	4.6088	50/50	4.6088
942761	AE2-292 C O1	8.6076	50/50	8.6076
942762	AE2-292 E O1	5.7384	50/50	5.7384
945081	AF1-173	2.4339	50/50	2.4339
961121	AF2-403	1.3958	50/50	1.3958
962741	AG1-123 C O2	1.2067	Adder	2.68

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
962742	AG1-123 E O2	0.8408	Adder	1.87
962751	AG1-124 C O2	1.4878	Adder	3.3
962752	AG1-124 E O2	1.0382	Adder	2.3
963601	AG1-209 C	0.4885	50/50	0.4885
963602	AG1-209 E	0.7328	50/50	0.7328
964141	AG1-275 C	2.0936	50/50	2.0936
964142	AG1-275 E	1.3958	50/50	1.3958
964151	AG1-276 C	2.0936	50/50	2.0936
964152	AG1-276 E	1.3958	50/50	1.3958
964251	AG1-286 C	0.8191	50/50	0.8191
964252	AG1-286 E	0.5461	50/50	0.5461
964531	AG1-316 C O2	2.0920	Adder	4.64
964532	AG1-316 E O2	0.5230	Adder	1.16
966251	AG1-494 C	0.4966	Adder	1.1
966252	AG1-494 E	0.7449	Adder	1.65
966691	AG1-539 C	3.6147	50/50	3.6147
966692	AG1-539 E	4.8573	50/50	4.8573
966761	AG1-547 C	5.6773	50/50	5.6773
966762	AG1-547 E	3.0462	50/50	3.0462
CPL	CPL	0.3344	Confirmed LTF	0.3344
CALDERWOOD	CALDERWOOD	0.0318	Confirmed LTF	0.0318
NY	NY	0.0691	Confirmed LTF	0.0691
PRAIRIE	PRAIRIE	0.4779	Confirmed LTF	0.4779
O-066	O-066	0.7403	Confirmed LTF	0.7403
CBM-S2	CBM-S2	2.7353	Confirmed LTF	2.7353
CHEOAH	CHEOAH	0.0275	Confirmed LTF	0.0275
COTTONWOOD	COTTONWOOD	0.2163	Confirmed LTF	0.2163
G-007	G-007	0.1145	Confirmed LTF	0.1145
GIBSON	GIBSON	0.1256	Confirmed LTF	0.1256
BLUEG	BLUEG	0.4218	Confirmed LTF	0.4218
TRIMBLE	TRIMBLE	0.1363	Confirmed LTF	0.1363

14.5.10 Index 10

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
174441749	314746	4BREMO	DVP	314744	3BREMO	DVP	1	DVP_P4-2: 29822	breaker	228.0	107.1	108.01	DC	4.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935241	AD1-161 C	1.4796	Adder	1.74
935242	AD1-161 E	1.2151	Adder	1.43
938821	AE1-108 C O1	56.8031	50/50	56.8031
938822	AE1-108 E O1	25.4933	50/50	25.4933
946293	AF1-293 BAT	13.6367	50/50	13.6367
946591	AF1-323 C	18.1464	50/50	18.1464
946592	AF1-323 E	12.0976	50/50	12.0976
958131	AF2-107 C	8.0379	50/50	8.0379
958132	AF2-107 E	4.4046	50/50	4.4046
960111	AF2-302 C	6.5987	50/50	6.5987
960112	AF2-302 E	4.3991	50/50	4.3991
961063	AF2-397 BAT	4.2883	Merchant Transmission	4.2883
961801	AG1-022 C	6.5987	50/50	6.5987
961802	AG1-022 E	4.3991	50/50	4.3991
962741	AG1-123 C O2	4.7294	50/50	4.7294
962742	AG1-123 E O2	3.2956	50/50	3.2956
962751	AG1-124 C O2	6.7323	50/50	6.7323
962752	AG1-124 E O2	4.6977	50/50	4.6977
964531	AG1-316 C O2	1.6619	Adder	3.69
964532	AG1-316 E O2	0.4155	Adder	0.92
965581	AG1-426	12.3754	50/50	12.3754
966251	AG1-494 C	2.8536	50/50	2.8536
966252	AG1-494 E	4.2804	50/50	4.2804
966792	AG1-550 BAT	7.3171	50/50	7.3171
WEC	WEC	0.1405	Confirmed LTF	0.1405
LGEE	LGEE	0.3041	Confirmed LTF	0.3041
CPL	CPL	0.3269	Confirmed LTF	0.3269
CBM-W2	CBM-W2	4.5786	Confirmed LTF	4.5786
NY	NY	0.1377	Confirmed LTF	0.1377
TVA	TVA	0.7826	Confirmed LTF	0.7826
O-066	O-066	2.0123	Confirmed LTF	2.0123
SIGE	SIGE	0.0819	Confirmed LTF	0.0819
CBM-S2	CBM-S2	5.8151	Confirmed LTF	5.8151
CBM-S1	CBM-S1	0.2071	Confirmed LTF	0.2071
G-007	G-007	0.3171	Confirmed LTF	0.3171
MEC	MEC	0.7468	Confirmed LTF	0.7468
LAGN	LAGN	0.9397	Confirmed LTF	0.9397
CBM-W1	CBM-W1	5.9445	Confirmed LTF	5.9445

14.5.11 Index 11

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
161696809	926520	AC1-123 TAP	AEP	242575	05CAMDLM	AEP	1	AEP_P2-2_#10292_05NEWLDN 138_1	bus	255.0	110.6	112.43	DC	4.68

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	1.9399	50/50	1.9399
246844	05SMG2	5.2732	50/50	5.2732
246845	05SMG3	3.3060	50/50	3.3060
246846	05SMG4	5.1913	50/50	5.1913
246847	05SMG5	2.0219	50/50	2.0219
247284	05LEESVG	1.0979	50/50	1.0979
925661	AC1-042 C	1.6528	50/50	1.6528
925662	AC1-042 E	2.6967	50/50	2.6967
925997	AC1-075 E	1.0121	Adder	1.19
926024	AC1-080 E	0.3358	Adder	0.4
926051	AC1-083 C O1	4.8651	50/50	4.8651
926052	AC1-083 E O1	7.9379	50/50	7.9379
926521	AC1-123 C O1	3.6473	50/50	3.6473
926522	AC1-123 E O1	10.8777	50/50	10.8777
926645	AC1-145 C	0.3104	50/50	0.3104
926646	AC1-145 E	1.7657	50/50	1.7657
933941	AD1-017 C	0.9730	50/50	0.9730
933942	AD1-017 E	1.5876	50/50	1.5876
938451	AE1-064 C	9.5344	50/50	9.5344
938452	AE1-064 E	4.9301	50/50	4.9301
939011	AE1-130 C	3.6885	Adder	4.34
939012	AE1-130 E	1.8476	Adder	2.17
939941	AE1-230 C	0.7456	50/50	0.7456
939942	AE1-230 E	1.3256	50/50	1.3256
940081	AE1-250 C	7.2262	Adder	8.5
940082	AE1-250 E	4.8175	Adder	5.67
941801	AE2-185 C	3.7282	50/50	3.7282
941802	AE2-185 E	2.4854	50/50	2.4854
941821	AE2-187 C	3.7282	50/50	3.7282
941822	AE2-187 E	1.6570	50/50	1.6570
942671	AE2-283 C	4.1010	50/50	4.1010
942672	AE2-283 E	2.1540	50/50	2.1540
942751	AE2-291 C	3.4203	Adder	4.02
942752	AE2-291 E	2.2802	Adder	2.68
942761	AE2-292 C O1	4.2586	Adder	5.01
942762	AE2-292 E O1	2.8391	Adder	3.34
945081	AF1-173	1.4447	50/50	1.4447
961121	AF2-403	0.8285	50/50	0.8285
963601	AG1-209 C	0.2900	50/50	0.2900
963602	AG1-209 E	0.4350	50/50	0.4350
964141	AG1-275 C	1.2427	50/50	1.2427

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964142	AG1-275 E	0.8285	50/50	0.8285
964151	AG1-276 C	1.2427	50/50	1.2427
964152	AG1-276 E	0.8285	50/50	0.8285
964251	AG1-286 C	0.6214	50/50	0.6214
964252	AG1-286 E	0.4142	50/50	0.4142
964533	AG1-316 BAT	4.6752	50/50	4.6752
966253	AG1-494 BAT	2.2424	Merchant Transmission	2.2424
966691	AG1-539 C	0.9479	Adder	2.1
966692	AG1-539 E	1.2737	Adder	2.83
966761	AG1-547 C	3.3698	50/50	3.3698
966762	AG1-547 E	1.8082	50/50	1.8082
CPLE	CPLE	0.6825	Confirmed LTF	0.6825
NY	NY	0.0476	Confirmed LTF	0.0476
PRAIRIE	PRAIRIE	0.1627	Confirmed LTF	0.1627
TVA	TVA	0.0602	Confirmed LTF	0.0602
O-066	O-066	0.5115	Confirmed LTF	0.5115
CBM-S2	CBM-S2	6.4310	Confirmed LTF	6.4310
CBM-S1	CBM-S1	0.0038	Confirmed LTF	0.0038
G-007	G-007	0.0788	Confirmed LTF	0.0788
GIBSON	GIBSON	0.0682	Confirmed LTF	0.0682
BLUEG	BLUEG	0.2448	Confirmed LTF	0.2448
TRIMBLE	TRIMBLE	0.0801	Confirmed LTF	0.0801
LAGN	LAGN	0.0962	Confirmed LTF	0.0962

14.5.12 Index 12

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
174255660	938820	AE1-108 TAP	DVP	314746	4BREMO	DVP	1	DVP_P4-2: 2106T2111	breaker	173.0	141.03	142.37	DC	5.13

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935241	AD1-161 C	1.6457	Adder	1.94
935242	AD1-161 E	1.3514	Adder	1.59
938821	AE1-108 C O1	63.1217	50/50	63.1217
938822	AE1-108 E O1	28.3291	50/50	28.3291
946293	AF1-293 BAT	7.9115	Merchant Transmission	7.9115
946591	AF1-323 C	20.1656	50/50	20.1656
946592	AF1-323 E	13.4438	50/50	13.4438
958131	AF2-107 C	8.9351	50/50	8.9351
958132	AF2-107 E	4.8964	50/50	4.8964
960111	AF2-302 C	7.3330	50/50	7.3330
960112	AF2-302 E	4.8886	50/50	4.8886
961801	AG1-022 C	7.3330	50/50	7.3330
961802	AG1-022 E	4.8886	50/50	4.8886
962741	AG1-123 C O2	5.2594	50/50	5.2594
962742	AG1-123 E O2	3.6649	50/50	3.6649
962751	AG1-124 C O2	7.4909	50/50	7.4909
962752	AG1-124 E O2	5.2271	50/50	5.2271
964531	AG1-316 C O2	1.8484	Adder	4.1
964532	AG1-316 E O2	0.4621	Adder	1.03
965581	AG1-426	13.7520	50/50	13.7520
966251	AG1-494 C	3.1736	50/50	3.1736
966252	AG1-494 E	4.7604	50/50	4.7604
966792	AG1-550 BAT	4.2395	50/50	4.2395
WEC	WEC	0.1559	Confirmed LTF	0.1559
LGEE	LGEE	0.3387	Confirmed LTF	0.3387
CPL	CPL	0.0607	Confirmed LTF	0.0607
CBM-W2	CBM-W2	4.5965	Confirmed LTF	4.5965
NY	NY	0.1288	Confirmed LTF	0.1288
TVA	TVA	0.7490	Confirmed LTF	0.7490
O-066	O-066	1.9652	Confirmed LTF	1.9652
SIGE	SIGE	0.0860	Confirmed LTF	0.0860
CBM-S2	CBM-S2	3.2677	Confirmed LTF	3.2677
CBM-S1	CBM-S1	0.2037	Confirmed LTF	0.2037
G-007	G-007	0.3098	Confirmed LTF	0.3098
MEC	MEC	0.7993	Confirmed LTF	0.7993
LAGN	LAGN	0.8925	Confirmed LTF	0.8925
CBM-W1	CBM-W1	6.6455	Confirmed LTF	6.6455

14.5.13 Index 13

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
173864993	946590	AF1-323 TAP	AEP	242792	05SCOTSV	AEP	1	DVP_P4-2: 29822	breaker	167.0	102.93	104.17	DC	4.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
935241	AD1-161 C	1.4796	Adder	1.74
935242	AD1-161 E	1.2151	Adder	1.43
946293	AF1-293 BAT	13.6367	50/50	13.6367
946591	AF1-323 C	18.1464	50/50	18.1464
946592	AF1-323 E	12.0976	50/50	12.0976
958131	AF2-107 C	8.0379	50/50	8.0379
958132	AF2-107 E	4.4046	50/50	4.4046
960111	AF2-302 C	6.5987	50/50	6.5987
960112	AF2-302 E	4.3991	50/50	4.3991
961063	AF2-397 BAT	4.2883	Merchant Transmission	4.2883
961801	AG1-022 C	6.5987	50/50	6.5987
961802	AG1-022 E	4.3991	50/50	4.3991
962741	AG1-123 C O2	4.7294	50/50	4.7294
962742	AG1-123 E O2	3.2956	50/50	3.2956
962751	AG1-124 C O2	6.7323	50/50	6.7323
962752	AG1-124 E O2	4.6977	50/50	4.6977
964531	AG1-316 C O2	1.6619	Adder	3.69
964532	AG1-316 E O2	0.4155	Adder	0.92
965582	AG1-426 BAT	7.6246	50/50	7.6246
966251	AG1-494 C	2.8536	50/50	2.8536
966252	AG1-494 E	4.2804	50/50	4.2804
966792	AG1-550 BAT	7.3171	50/50	7.3171
WEC	WEC	0.1405	Confirmed LTF	0.1405
LGEE	LGEE	0.3041	Confirmed LTF	0.3041
CPL	CPL	0.3269	Confirmed LTF	0.3269
CBM-W2	CBM-W2	4.5786	Confirmed LTF	4.5786
NY	NY	0.1377	Confirmed LTF	0.1377
TVA	TVA	0.7826	Confirmed LTF	0.7826
O-066	O-066	2.0123	Confirmed LTF	2.0123
SIGE	SIGE	0.0819	Confirmed LTF	0.0819
CBM-S2	CBM-S2	5.8151	Confirmed LTF	5.8151
CBM-S1	CBM-S1	0.2071	Confirmed LTF	0.2071
G-007	G-007	0.3171	Confirmed LTF	0.3171
MEC	MEC	0.7468	Confirmed LTF	0.7468
LAGN	LAGN	0.9397	Confirmed LTF	0.9397
CBM-W1	CBM-W1	5.9445	Confirmed LTF	5.9445

14.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
AEP_P2-1_242569 05BRUSHT 138 242734 05NEWLDN 138 1	CONTINGENCY 'AEP_P2-1_242569 05BRUSHT 138 242734 05NEWLDN 138 1' / 602 OPEN BRANCH FROM BUS 242569 TO BUS 242734 CKT 1 / 242569 05BRUSHT 138 242734 05NEWLDN 138 1 END
AEP_P2-1_242575 05CAMDLM 138 926520 AC1-123 TAP 138 1-A	CONTINGENCY 'AEP_P2-1_242575 05CAMDLM 138 926520 AC1-123 TAP 138 1-A' OPEN BRANCH FROM BUS 242575 TO BUS 926520 CKT 1 END
DVP_P2-2: BREMO B1	CONTINGENCY 'DVP_P2-2: BREMO B1' /* BREMO 230 KV OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G118.000 OPEN BUS 315191 /* ISLAND: 1BEARGRDN G118.000 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G218.000 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN S122.000 OPEN BUS 315192 /* ISLAND: 1BEARGRDN G218.000 OPEN BUS 315193 /* ISLAND: 1BEARGRDN S122.000 OPEN BRANCH FROM BUS 314677 TO BUS 314747 CKT 1 /* 6BUCKING 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313868 TO BUS 314747 CKT 1 /* 6CARTERV 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313867 TO BUS 314747 CKT 1 /* 6BREMODIST 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314744 TO BUS 314747 CKT 1 /* 3BREMO 115.00 - 6BREMO 230.00 OPEN BUS 314747 /* 6BREMO 230.00 KV OPEN BUS 314326 /* ISLAND: 6BEARGRDN 230.00 END

Contingency Name	Contingency Definition
AEP_P4_#10164_05EDAN 2 138_M	CONTINGENCY 'AEP_P4_#10164_05EDAN 2 138_M' OPEN BRANCH FROM BUS 242531 TO BUS 304094 CKT 1 / 242531 05EDANV2 230 304094 6YANCY TAP 230 1 OPEN BRANCH FROM BUS 242531 TO BUS 242632 CKT 4 / 242531 05EDANV2 230 242632 05EDAN 2 138 4 OPEN BRANCH FROM BUS 242549 TO BUS 940080 CKT 1 / 242549 05BANSTR 138 940080 AE1-250 TAP 138 1 OPEN BRANCH FROM BUS 242549 TO BUS 242632 CKT 1 / 242549 05BANSTR 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242549 TO BUS 314668 CKT Z1 / 242549 05BANSTR 138 314668 4BANISTR 138 Z1 OPEN BRANCH FROM BUS 242629 TO BUS 242632 CKT 1 / 242629 05E.MONU 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242631 TO BUS 242632 CKT Z1 / 242631 05EDAN 1 138 242632 05EDAN 2 138 Z1 END
AEP_P1-3_#1372_05JOSHUA 765_1	CONTINGENCY 'AEP_P1-3_#1372_05JOSHUA 765_1' OPEN BRANCH FROM BUS 242515 TO BUS 247669 CKT 1 / 242515 05JOSHUA 765 247669 05JOSHUA 1EQ 999 1 OPEN BRANCH FROM BUS 247669 TO BUS 247670 CKT 1 / 247669 05JOSHUA 1EQ 999 247670 05JOSHUA_XFL 138 1 OPEN BRANCH FROM BUS 242688 TO BUS 247670 CKT 1 / 242688 05JOSHUA 138 247670 05JOSHUA_XFL 138 1 END
DVP_P1-2: LN 556-B-C	CONTINGENCY 'DVP_P1-2: LN 556-B-C' OPEN BRANCH FROM BUS 966360 TO BUS 314936 CKT 1 /* AG1-505 TAP 500.00 - 8RAWLINGS 500.00 END
AEP_P2-2_#6213_05WLAKE 138_1	CONTINGENCY 'AEP_P2-2_#6213_05WLAKE 138_1' OPEN BRANCH FROM BUS 242748 TO BUS 243951 CKT 1 / 242748 05PENHOK 138 243951 05REDWOOD 138 1 OPEN BRANCH FROM BUS 242748 TO BUS 242802 CKT 1 / 242748 05PENHOK 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242843 TO BUS 243951 CKT 1 / 242843 05WLAKE 138 243951 05REDWOOD 138 1 END
DVP_P2-2: DOOMS B2	CONTINGENCY 'DVP_P2-2: DOOMS B2' /* DOOMS 115 KV OPEN BRANCH FROM BUS 314767 TO BUS 314793 CKT 1 /* 3MIDWAY 115.00 - 3DOOMS 115.00 OPEN BRANCH FROM BUS 314791 TO BUS 314793 CKT 1 /* 3BRND DP 115.00 - 3DOOMS 115.00 OPEN BRANCH FROM BUS 314793 TO BUS 314819 CKT 1 /* 3DOOMS 115.00 - 3WAYNSBO 115.00 END

Contingency Name	Contingency Definition
AEP_P2-1_242641 05FOREST 138 242734 05NEWLDN 138 1	CONTINGENCY 'AEP_P2-1_242641 05FOREST 138 242734 05NEWLDN 138 1' / 496 OPEN BRANCH FROM BUS 242641 TO BUS 242734 CKT 1 / 242641 05FOREST 138 242734 05NEWLDN 138 1 END
DVP_P4-2: 2106T2111	CONTINGENCY 'DVP_P4-2: 2106T2111' / 634 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 / 314326 6BEARGRDN 230 314747 6BREMO 230 1 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 / 314326 6BEARGRDN 230 315191 1BEARGRDN G1 18.0 1 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 / 314326 6BEARGRDN 230 314747 6BREMO 230 2 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 / 314326 6BEARGRDN 230 315192 1BEARGRDN G2 18.0 1 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 / 314326 6BEARGRDN 230 315193 1BEARGRDN S1 22.0 1 END
DVP_P4-2: 3132	CONTINGENCY 'DVP_P4-2: 3132' /* ALTAVISTA 115 KV OPEN BRANCH FROM BUS 314666 TO BUS 314712 CKT 1 /* 3ALTVSTA 115.00 - 3OTTER R 115.00 OPEN BRANCH FROM BUS 314694 TO BUS 314712 CKT 1 /* 3GRIT 115.00 - 3OTTER R 115.00 OPEN BRANCH FROM BUS 314694 TO BUS 942750 CKT 1 /* 3GRIT 115.00 - AE2-291 TAP 115.00 OPEN BUS 314694 /* ISLAND: 3GRIT 115.00 OPEN BUS 314712 /* ISLAND: 3OTTER R 115.00 OPEN BRANCH FROM BUS 314666 TO BUS 314689 CKT 1 /* 3ALTVSTA 115.00 - 3DOMINIO 115.00 OPEN BRANCH FROM BUS 314666 TO BUS 314700 CKT 1 /* 3ALTVSTA 115.00 - 3HALL BR 115.00 OPEN BRANCH FROM BUS 314666 TO BUS 314667 CKT 1 /* 3ALTVSTA 115.00 - 4ALTVSTA 138.00 OPEN BRANCH FROM BUS 314666 TO BUS 314667 CKT 2 /* 3ALTVSTA 115.00 - 4ALTVSTA 138.00 OPEN BUS 314515 /* 3ALTVS_1 115.00 KV OPEN BUS 314666 /* 3ALTVSTA 115.00 KV OPEN BUS 314700 /* ISLAND: 3HALL BR 115.00 OPEN BUS 314705 /* ISLAND: 3HURT 115.00 OPEN BUS 315156 /* ISLAND: 1HALLBR1 13.800 END

Contingency Name	Contingency Definition
DVP_P7-1: LN 2106-2111	CONTINGENCY 'DVP_P7-1: LN 2106-2111' /* . OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G118.000 OPEN BUS 315191 /* ISLAND: 1BEARGRDN G118.000 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G218.000 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN S122.000 OPEN BUS 315192 /* ISLAND: 1BEARGRDN G218.000 OPEN BUS 315193 /* ISLAND: 1BEARGRDN S122.000 END
AEP_P4_#10213_05CLOVRD 138_A	CONTINGENCY 'AEP_P4_#10213_05CLOVRD 138_A' / 363 OPEN BRANCH FROM BUS 242560 TO BUS 242607 CKT 1 / 242560 05BONSCK 138 242607 05CLOVRD 138 1 OPEN BRANCH FROM BUS 242560 TO BUS 242840 CKT 1 / 242560 05BONSCK 138 242840 05VINTON 138 1 OPEN BRANCH FROM BUS 242607 TO BUS 243892 CKT 1 / 242607 05CLOVRD 138 243892 05MEADS8 138 1 OPEN BRANCH FROM BUS 242720 TO BUS 243892 CKT 1 / 242720 05MONETA 138 243892 05MEADS8 138 1 OPEN BRANCH FROM BUS 242720 TO BUS 242775 CKT 1 / 242720 05MONETA 138 242775 05ROCKCAS SS 138 1 OPEN BRANCH FROM BUS 242773 TO BUS 242840 CKT 1 / 242773 05ROANO1 138 242840 05VINTON 138 1 OPEN BRANCH FROM BUS 242775 TO BUS 242802 CKT 1 / 242775 05ROCKCAS SS 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242775 TO BUS 245675 CKT Z1 / 242775 05ROCKCAS SS 138 245675 05WHITEHOUS8 138 Z1 OPEN BRANCH FROM BUS 243892 TO BUS 243893 CKT Z1 / 243892 05MEADS8 138 243893 05MEADS 8 24.9 Z1 REMOVE LOAD C1 FROM BUS 242775 /* 242775 05ROCKCAS SS 138 DEFAULT DISPATCH END
AEP_P2-2_#10292_05NEWLDN 138_1	CONTINGENCY 'AEP_P2-2_#10292_05NEWLDN 138_1' OPEN BRANCH FROM BUS 242569 TO BUS 242734 CKT 1 / 242569 05BRUSHT 138 242734 05NEWLDN 138 1 OPEN BRANCH FROM BUS 242641 TO BUS 242734 CKT 1 / 242641 05FOREST 138 242734 05NEWLDN 138 1 OPEN BRANCH FROM BUS 242687 TO BUS 242734 CKT 1 / 242687 05JOHNMT 138 242734 05NEWLDN 138 1 END

Contingency Name	Contingency Definition
AEP_P1-2_#5366_42-A	CONTINGENCY 'AEP_P1-2_#5366_42-A' / 325 OPEN BRANCH FROM BUS 242549 TO BUS 940080 CKT 1 / 242549 05BANSTR 138 940080 AE1-250 TAP 138 1 OPEN BRANCH FROM BUS 242549 TO BUS 242632 CKT 1 / 242549 05BANSTR 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242549 TO BUS 314668 CKT Z1 / 242549 05BANSTR 138 314668 4BANISTR 138 Z1 END
DVP_P7-1: LN 555-2168-A	CONTINGENCY 'DVP_P7-1: LN 555-2168-A' /* . OPEN BRANCH FROM BUS 314907 TO BUS 314912 CKT 1 /* 8DOOMS 500.00 - 8LEXNGTN 500.00 OPEN BRANCH FROM BUS 314794 TO BUS 965530 CKT 1 /* 6DOOMS 230.00 - AG1- 421 TAP 230.00 END
DVP_P7-1: LN 555-2168-B	CONTINGENCY 'DVP_P7-1: LN 555-2168-B' /* . OPEN BRANCH FROM BUS 314907 TO BUS 314912 CKT 1 /* 8DOOMS 500.00 - 8LEXNGTN 500.00 OPEN BRANCH FROM BUS 965530 TO BUS 314854 CKT 1 /* AG1-421 TAP 230.00 - 6LEXNGT1 230.00 END
Base Case	
AEP_P2-2_#13260_05SKIMMR 69.0_1	CONTINGENCY 'AEP_P2-2_#13260_05SKIMMR 69.0_1' OPEN BRANCH FROM BUS 242886 TO BUS 314861 CKT 1 / 242886 05SKIMMR 69.0 314861 3SKIMMR 115 1 OPEN BRANCH FROM BUS 242886 TO BUS 314861 CKT 2 / 242886 05SKIMMR 69.0 314861 3SKIMMR 115 2 OPEN BRANCH FROM BUS 242860 TO BUS 242886 CKT 1 / 242860 05ABERT 69.0 242886 05SKIMMR 69.0 1 OPEN BRANCH FROM BUS 242884 TO BUS 242886 CKT 1 / 242884 05S.LYNCHB 69.0 242886 05SKIMMR 69.0 1 REMOVE SWSHUNT FROM BUS 242886 / 242886 05SKIMMR 69.0 END
AEP_P4_#13922_05OPOSSUMCK 138_D	CONTINGENCY 'AEP_P4_#13922_05OPOSSUMCK 138_D' OPEN BRANCH FROM BUS 242575 TO BUS 242737 CKT 1 / 242575 05CAMDLM 138 242737 05OPOSSUMCK 138 1 OPEN BRANCH FROM BUS 242575 TO BUS 242781 CKT 1 / 242575 05CAMDLM 138 242781 05RUSTBR 138 1 OPEN BRANCH FROM BUS 242575 TO BUS 926520 CKT 1 / 242575 05CAMDLM 138 926520 AC1-123 TAP 138 1 OPEN BRANCH FROM BUS 242737 TO BUS 242785 CKT 1 / 242737 05OPOSSUMCK 138 242785 05S.LYNC 138 1 END

Contingency Name	Contingency Definition
DVP_P4-2: 210622	CONTINGENCY 'DVP_P4-2: 210622' /* BREMO 230 KV OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G118.000 OPEN BUS 315191 /* ISLAND: 1BEARGRDN G118.000 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G218.000 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN S122.000 OPEN BUS 315192 /* ISLAND: 1BEARGRDN G218.000 OPEN BUS 315193 /* ISLAND: 1BEARGRDN S122.000 OPEN BRANCH FROM BUS 314677 TO BUS 314747 CKT 1 /* 6BUCKING 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313868 TO BUS 314747 CKT 1 /* 6CARTERV 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313867 TO BUS 314747 CKT 1 /* 6BREMODIST 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314744 TO BUS 314747 CKT 1 /* 3BREMO 115.00 - 6BREMO 230.00 OPEN BUS 314747 /* 6BREMO 230.00 KV OPEN BUS 314326 /* ISLAND: 6BEARGRDN 230.00 END
AEP_P7-1_#10778	CONTINGENCY 'AEP_P7-1_#10778' OPEN BRANCH FROM BUS 242531 TO BUS 304094 CKT 1 / 242531 05EDANV2 230 304094 6YANCY TAP 230 1 OPEN BRANCH FROM BUS 242531 TO BUS 242632 CKT 4 / 242531 05EDANV2 230 242632 05EDAN 2 138 4 OPEN BRANCH FROM BUS 242549 TO BUS 242632 CKT 1 / 242549 05BANSTR 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242629 TO BUS 242632 CKT 1 / 242629 05E.MONU 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242629 TO BUS 242770 CKT 1 / 242629 05E.MONU 138 242770 05RIGIS 138 1 OPEN BRANCH FROM BUS 242631 TO BUS 242632 CKT Z1 / 242631 05EDAN 1 138 242632 05EDAN 2 138 Z1 OPEN BRANCH FROM BUS 242629 TO BUS 243948 CKT 1 / 242629 05E.MONU 138 243948 05BRANTLY 69.0 1 OPEN BRANCH FROM BUS 242770 TO BUS 243988 CKT 1 / 242770 05RIGIS 138 243988 05RIGIS 69.0 1 OPEN BRANCH FROM BUS 243974 TO BUS 243988 CKT 1 / 243974 05GOODYEAR 69.0 243988 05RIGIS 69.0 1 END

Contingency Name	Contingency Definition
PJM_PLANT BEAR GARDEN	CONTINGENCY 'PJM_PLANT BEAR GARDEN' / 575 REMOVE MACHINE G1 FROM BUS 315191 /* 315191 1BEARGRDN G1 18.0 DEFAULT DISPATCH REMOVE MACHINE G2 FROM BUS 315192 /* 315192 1BEARGRDN G2 18.0 DEFAULT DISPATCH REMOVE MACHINE S1 FROM BUS 315193 /* 315193 1BEARGRDN S1 22.0 DEFAULT DISPATCH END
DVP_P4-2: 29822	CONTINGENCY 'DVP_P4-2: 29822' /* BREMO 230 KV OPEN BRANCH FROM BUS 314677 TO BUS 966860 CKT 1 /* 6BUCKING 230.00 - AG1-557 TAP 230.00 OPEN BRANCH FROM BUS 314677 TO BUS 314747 CKT 1 /* 6BUCKING 230.00 - 6BREMO 230.00 OPEN BUS 314677 /* ISLAND: 6BUCKING 230.00 OPEN BUS 924032 /* ISLAND: AB2-045 E 230.00 OPEN BUS 932511 /* ISLAND: AC2-071 C 230.00 OPEN BUS 932512 /* ISLAND: AC2-071 E 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 1 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315191 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G118.000 OPEN BUS 315191 /* ISLAND: 1BEARGRDN G118.000 OPEN BRANCH FROM BUS 314326 TO BUS 314747 CKT 2 /* 6BEARGRDN 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314326 TO BUS 315192 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN G218.000 OPEN BRANCH FROM BUS 314326 TO BUS 315193 CKT 1 /* 6BEARGRDN 230.00 - 1BEARGRDN S122.000 OPEN BUS 315192 /* ISLAND: 1BEARGRDN G218.000 OPEN BUS 315193 /* ISLAND: 1BEARGRDN S122.000 OPEN BRANCH FROM BUS 313868 TO BUS 314747 CKT 1 /* 6CARTERV 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 313867 TO BUS 314747 CKT 1 /* 6BREMODIST 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314744 TO BUS 314747 CKT 1 /* 3BREMO 115.00 - 6BREMO 230.00 OPEN BUS 314747 /* 6BREMO 230.00 KV OPEN BUS 314326 /* ISLAND: 6BEARGRDN 230.00 END

Contingency Name	Contingency Definition
AEP_P1-2_#5419_105	CONTINGENCY 'AEP_P1-2_#5419_105' / 337 OPEN BRANCH FROM BUS 242607 TO BUS 243892 CKT 1 / 242607 05CLOVRD 138 243892 05MEADS8 138 1 OPEN BRANCH FROM BUS 242720 TO BUS 243892 CKT 1 / 242720 05MONETA 138 243892 05MEADS8 138 1 OPEN BRANCH FROM BUS 242720 TO BUS 242775 CKT 1 / 242720 05MONETA 138 242775 05ROCKCAS SS 138 1 OPEN BRANCH FROM BUS 242775 TO BUS 242802 CKT 1 / 242775 05ROCKCAS SS 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242775 TO BUS 245675 CKT Z1 / 242775 05ROCKCAS SS 138 245675 05WHITEHOUS8 138 Z1 OPEN BRANCH FROM BUS 243892 TO BUS 243893 CKT Z1 / 243892 05MEADS8 138 243893 05MEADS 8 24.9 Z1 REMOVE LOAD C1 FROM BUS 242775 /* 242775 05ROCKCAS SS 138 DEFAULT DISPATCH END
AEP_P2-2_#10163_05EDAN 2 138_2	CONTINGENCY 'AEP_P2-2_#10163_05EDAN 2 138_2' OPEN BRANCH FROM BUS 242531 TO BUS 304094 CKT 1 / 242531 05EDANV2 230 304094 6YANCY TAP 230 1 OPEN BRANCH FROM BUS 242531 TO BUS 242632 CKT 4 / 242531 05EDANV2 230 242632 05EDAN 2 138 4 OPEN BRANCH FROM BUS 242549 TO BUS 242632 CKT 1 / 242549 05BANSTR 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242629 TO BUS 242632 CKT 1 / 242629 05E.MONU 138 242632 05EDAN 2 138 1 OPEN BRANCH FROM BUS 242631 TO BUS 242632 CKT Z1 / 242631 05EDAN 1 138 242632 05EDAN 2 138 Z1 END
AEP_P7-1_#10830	CONTINGENCY 'AEP_P7-1_#10830' OPEN BRANCH FROM BUS 242555 TO BUS 242843 CKT 1 / 242555 05BLAINE 138 242843 05WLAKE 138 1 OPEN BRANCH FROM BUS 242748 TO BUS 243951 CKT 1 / 242748 05PENHOK 138 243951 05REDWOOD 138 1 OPEN BRANCH FROM BUS 242748 TO BUS 242802 CKT 1 / 242748 05PENHOK 138 242802 05SMITHMTN 138 1 OPEN BRANCH FROM BUS 242843 TO BUS 243951 CKT 1 / 242843 05WLAKE 138 243951 05REDWOOD 138 1 END
AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1	CONTINGENCY 'AEP_P2-1_242607 05CLOVRD 138 243892 05MEADS8 138 1' OPEN BRANCH FROM BUS 242607 TO BUS 243892 CKT 1 END

15 Affected Systems

15.1 TVA

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

15.2 Duke Energy Progress

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

15.3 MISO

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

15.4 LG&E

LG&E Impacts to be determined during later study phases (as applicable).