



**Generation Interconnection
System Impact Study Report
for
Queue Project AF2-008
SULLIVAN 345 KV
500 MW Capacity / 1000 MW Energy**

April 2022

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1 Introduction

This System Impact Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 205, as well as the System Impact 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 System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. 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 System Impact Study is performed.

The System Impact 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.

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

3 General

The Interconnection Customer (IC) has proposed an uprate to a planned a Merchant Transmission line located in Sullivan, Indiana. This project is an increase to the Interconnection Customer's AF1-088 project, which will share the same point of interconnection. The AF2-008 queue position is a 1000 MW uprate (500 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 2000 MW with 1500 MW of this output being recognized by PJM as Capacity.

The proposed in-service date for this uprate project is December 31, 2025. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-008
Project Name	SULLIVAN 345 KV
State	Indiana
County	Sullivan
Transmission Owner	AEP
MFO	2000
MWE	1000
MWC	500
Fuel	None
Basecase Study Year	2023

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

4 Point of Interconnection

AF2-008 will interconnect with the AEP transmission system via a direct connection to the Sullivan 345 kV station as an uprate to PJM queue position AF1-088

Note: It is assumed that the existing 345 kV revenue metering system, generation lead and Protection & Control Equipment that will be installed for AF1-088 will be adequate for the increased generation of AF2-008. Depending on the timing of the completion of the AF1-088 interconnection construction relative to the AF2-008 completion, there may (or may not) be a need to review and revise the relay settings for the increased generation of AF2-008..

5 Cost Summary

The AF2-008 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$45,000
Total System Network Upgrade Costs (Summer Peak)	\$164,830,800
Total System Network Upgrade Costs(Light Load)	\$0
Total System Network Upgrade Costs (TO Identified)	\$0
Total Costs	\$164,875,800

*As your project progresses through the study process and other projects modify their request or withdraw, then your cost allocation could change.

The estimates provided in this report are preliminary in nature, as they were determined without the benefit of detailed engineering studies. Final estimates will require an on-site review and coordination to determine final construction requirements. In addition, Stability analysis will be completed during the Facilities Study stage. It is possible that a need for additional upgrades could be identified by these studies.

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

Note 1: PJM Open Access Transmission Tariff (OATT) section 217.3A outline cost allocation rules. The rules are further clarified in PJM Manual 14A Attachment B. The allocation of costs for a network upgrade will start with the first Queue project to cause the need for the upgrade. Later queue projects will receive cost allocation contingent on their contribution to the violation and are allocated to the queues that have not

closed less than 5 years following the execution of the first Interconnection Service Agreement which identifies the need for this upgrade.

Note 2: For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

6 Transmission Owner Scope of Work

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

6.1 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
None	\$0
Total Attachment Facility Costs	\$0

6.2 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
None	\$0
Total Direct Connection Facility Costs	\$0

6.3 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 Sullivan 345 kV station	\$45,000
Total Non-Direct Connection Facility Costs	\$45,000

7 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.

8 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.

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.

9 Revenue Metering and SCADA Requirements

9.1 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.

9.2 Meteorological Data Reporting Requirements

9.3 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/>

10 Summer Peak Analysis

The Queue Project AF2-008 was evaluated as a 1000 MW (Capacity 500 MW) injection as an uprate to AF1-088 at the Sullivan 345 kV substation in the AEP area. Project AF2-008 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-008 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

10.1 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 IMPAC T
95169795	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	AEP_P1-2_#8905	single	3970.0	95.43	100.18	AC	167.15
95169691	247712	05SULLIVAN	345.0	AEP	956820	J1180 TAP	345.0	AMIL	1	AEP_P1-2_#10135	single	1466.0	91.02	105.38	AC	184.07
95169827	247712	05SULLIVAN	345.0	AEP	243217	05DEQUIN	345.0	AEP	1	AEP_P1-2_#363	single	1318.0	95.28	100.82	DC	73.06

10.2 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 IMPAC T
95169597	243222	05FALLC	345.0	AEP	923880	AB2 - 028 TAP	345.0	AEP	1	AEP_P4_#8648_05JEFR SO 765_B	breaker	1195.0	93.94	100.55	AC	79.99

10.3 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 IMPAC T
95169460	242865	05JEFRSO	345.0	AEP	248000	06CLIFTY	345.0	OVERC	Z1	AEP_P4_#1760_05JEFR SO 765_A	breaker	2354.0	131.57	142.54	AC	234.46
95169461	242865	05JEFRSO	345.0	AEP	248000	06CLIFTY	345.0	OVERC	Z1	AEP_P4_#6189_05SHAN G R 765_D1	breaker	2354.0	103.77	106.76	AC	170.57
95169562	243208	05JEFRSO	765.0	AEP	242865	05JEFRSO	345.0	AEP	2	AEP_P4_#1760_05JEFR SO 765_A	breaker	3039.0	103.59	112.24	AC	234.46
95169522	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	AEP_P4_#8906_05SULLIVAN 345_C	breaker	3970.0	110.1	121.74	AC	388.99
95169523	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	AEP_P4_#8910_05DEQUIN 345_C	breaker	3970.0	104.36	114.23	AC	335.35
95169794	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	Base Case	single	3452.0	101.84	106.67	AC	152.65
95170215	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	AEP_P7-1_#11042-B	tower	3970.0	117.87	128.83	AC	332.38

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 PROJECTIONS LOADING %	POST PROJECTIONS LOADING %	ACDC	MW IMPACT
95170216	243209	05ROCKPT	765.0	AEP	243208	05JEFRS O	765.0	AEP	1	AEP_P7-1_#11042-A	tower	3970.0	117.85	129.01	AC	332.38
95169450	243216	05DARWIN	345.0	AEP	243221	05EUGENE	345.0	AEP	1	AEP_P4_#8648_05JEFR SO 765_B	breaker	1160.0	135.52	154.33	DC	218.2
95169705	243216	05DARWIN	345.0	AEP	243221	05EUGENE	345.0	AEP	1	AEP_P1-2_#363	single	1160.0	126.57	135.96	DC	108.95
95169706	243216	05DARWIN	345.0	AEP	243221	05EUGENE	345.0	AEP	1	AEP_P1-2_#10136	single	1160.0	101.43	111.08	AC	109.68
95169435	247712	05SULLIVAN	345.0	AEP	956820	J1180 TAP	345.0	AMIL	1	AEP_P4_#8648_05JEFR SO 765_B	breaker	1466.0	140.21	165.08	DC	365.81
95169445	247712	05SULLIVAN	345.0	AEP	243216	05DARWIN	345.0	AEP	1	AEP_P4_#8648_05JEFR SO 765_B	breaker	1160.0	135.52	154.33	DC	218.2
95169498	247712	05SULLIVAN	345.0	AEP	254529	16PETE	345.0	IPL	1	AEP_P4_#8648_05JEFR SO 765_B	breaker	1409.0	104.35	122.47	DC	255.67
95169555	247712	05SULLIVAN	345.0	AEP	243217	05DEQUIN	345.0	AEP	1	AEP_P4_#8648_05JEFR SO 765_B	breaker	1318.0	101.24	112.37	DC	146.79
95169687	247712	05SULLIVAN	345.0	AEP	956820	J1180 TAP	345.0	AMIL	1	AEP_P1-2_#363	single	1466.0	121.5	133.97	DC	182.83
95169714	247712	05SULLIVAN	345.0	AEP	243216	05DARWIN	345.0	AEP	1	AEP_P1-2_#363	single	1160.0	126.57	135.96	DC	108.95
95169715	247712	05SULLIVAN	345.0	AEP	243216	05DARWIN	345.0	AEP	1	AEP_P1-2_#10136	single	1160.0	101.43	111.08	AC	109.68
98608233	248000	06CLIFTY	345.0	OVEC	248001	06DEARB1	345.0	OVEC	1	AEP_P4_#1760_05JEFR SO 765_A	breaker	1023.0	110.59	116.55	AC	61.04
96032200	270704	LORETTO ; B	345.0	CE	939400	AE1-172 TAP	345.0	CE	1	COMED_P1-2_345-L8014___-S-B	single	1528.0	128.3	130.31	AC	28.95
96032201	270704	LORETTO ; B	345.0	CE	939400	AE1-172 TAP	345.0	CE	1	COMED_P1-2_345-L8014___-S-A	single	1528.0	122.6	124.59	AC	28.95
96032218	270852	PONTIAC ; B	345.0	CE	270704	LORETTO ; B	345.0	CE	1	COMED_P1-2_345-L8014___-S-B	single	1528.0	124.74	126.76	AC	29.1
96032219	270852	PONTIAC ; B	345.0	CE	270704	LORETTO ; B	345.0	CE	1	COMED_P1-2_345-L8014___-S-A	single	1528.0	119.02	121.02	AC	29.1
96032228	270853	PONTIAC ; R	345.0	CE	935000	AD1-133 TAP	345.0	CE	1	COMED_P1-2_345-L11212_B-S-B	single	1528.0	115.5	117.37	AC	26.78
96032229	270853	PONTIAC ; R	345.0	CE	935000	AD1-133 TAP	345.0	CE	1	COMED_P1-2_345-L11212_B-S-C	single	1528.0	112.49	114.35	AC	26.78
98608456	324010	7TRIMBL REAC	345.0	LGEE	248000	06CLIFTY	345.0	OVEC	1	AEP_P1-2_#363	single	1451.0	122.93	125.13	DC	31.93
98608457	324010	7TRIMBL REAC	345.0	LGEE	248000	06CLIFTY	345.0	OVEC	1	AEP_P1-2_#10136	single	1451.0	118.98	121.46	AC	32.14
96032272	917500	Z2-087 TAP	345.0	CE	270853	PONTIAC ; R	345.0	CE	1	COMED_P1-2_345-L8002___-S	single	1793.0	104.42	106.09	AC	29.18
96032273	917500	Z2-087 TAP	345.0	CE	270853	PONTIAC ; R	345.0	CE	1	COMED_P1-2_345-L17802___-S	single	1793.0	102.34	104.01	AC	29.28
96032210	935000	AD1-133 TAP	345.0	CE	270717	DRESDE N ; R	345.0	CE	1	COMED_P1-2_345-L11212_B-S-B	single	1528.0	122.89	124.77	AC	26.78
96032211	935000	AD1-133 TAP	345.0	CE	270717	DRESDE N ; R	345.0	CE	1	COMED_P1-2_345-L11212_B-S-C	single	1528.0	118.9	120.77	AC	26.78
96032186	939400	AE1-172 TAP	345.0	CE	934720	AD1-100 TAP	345.0	CE	1	COMED_P1-2_345-L8014___-S-B	single	1528.0	132.56	134.58	AC	28.95
96032187	939400	AE1-172 TAP	345.0	CE	934720	AD1-100 TAP	345.0	CE	1	COMED_P1-2_345-L8014___-S-A	single	1528.0	127.02	129.03	AC	28.95

10.4 Steady-State Voltage Requirements

None.

10.5 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 LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
95169875	242865	05JEFRSO	345.0	AEP	248000	06CLIFTY	345.0	OVCE	Z1	AEP_P1-2_#709	operation	2354.0	102.17	105.08	AC	170.83
95169789	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	Base Case	operation	3452.0	111.28	121.24	AC	305.3
95169790	243209	05ROCKPT	765.0	AEP	243208	05JEFRSO	765.0	AEP	1	AEP_P1-2_#8905	operation	3970.0	103.98	113.79	AC	334.3
95169702	243216	05DARWIN	345.0	AEP	243221	05EUGENE	345.0	AEP	1	AEP_P1-2_#363	operation	1160.0	134.89	153.67	DC	217.9
95169806	243878	05MEADOW	345.0	AEP	958970	AF2-188 TAP	345.0	AEP	1	AEP_P1-2_#8807-A	operation	2246.0	122.59	129.32	AC	139.46
156440909	243878	05MEADOW	345.0	AEP	255205	17REYNOLDS	345.0	NIPS	2	AEP_P1-2_#8695-B	operation	2246.0	121.81	128.32	AC	139.79
95169684	247712	05SULLIVAN	345.0	AEP	956820	J1180 TAP	345.0	AMIL	1	AEP_P1-2_#363	operation	1466.0	139.93	164.84	DC	365.66
95169711	247712	05SULLIVAN	345.0	AEP	243216	05DARWIN	345.0	AEP	1	AEP_P1-2_#363	operation	1160.0	134.89	153.67	DC	217.9
95169758	247712	05SULLIVAN	345.0	AEP	254529	16PETE	345.0	IPL	1	AEP_P1-2_#363	operation	1409.0	103.54	121.78	DC	256.79
95169824	247712	05SULLIVAN	345.0	AEP	243217	05DEQUIN	345.0	AEP	1	AEP_P1-2_#363	operation	1318.0	100.2	111.28	DC	146.12
98608453	324010	7TRIMBL REAC	345.0	LGEE	248000	06CLIFTY	345.0	OVCE	1	AEP_P1-2_#363	operation	1451.0	124.38	128.89	AC	63.85
95169782	958970	AF2-188 TAP	345.0	AEP	255205	17REYNOLDS	345.0	NIPS	1	AEP_P1-2_#8807-A	operation	2246.0	121.82	128.26	AC	139.46

10.6 System Reinforcements

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number
95169706,9 5169705,95 169450	9	05DARWIN 345.0 kV - 05EUGENE 345.0 kV Ckt 1	<u>AEP</u>			
			1.) Rebuild 3.83 miles of 2303.5 ACAR, conductor section 1, new ratings 1166/1419 MVA SN/SE. 24-36 months. \$7.66M. PJM Network Upgrade: N7980.1			
			2.) Rebuild 47.02 miles of 1414 ACSR/PE, conductor section 2, new ratings 1759/1759 MVA SN/SE. 24-36 months. \$94M. PJM Network Upgrade: N7980.2	\$7,660,000 +	\$1,935,000 +	N7980.1
			3.) Add a 765 kV breaker 'B2' at Jefferson 765 kV to eliminate stuck breaker contingency. \$4M. PJM Network Upgrade: N6628	\$94,000,000 +	\$31,332,000 +	N7980.2
				\$4,000,000	\$0 = \$33,267,000	N6628
			<u>Note:</u> Since the cost of the upgrade 3.) are less than \$5M, based on PJM cost allocation criteria, AF2-008 currently does not receive cost allocation towards this upgrade. As changes to the PJM queue process occur (such as prior queued projects withdrawing from the			

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number																												
95169445,9 5169714,95 169715	10	05SULLIVAN 345.0 kV - 05DARWIN 345.0 kV Ckt 1	queue, reducing in size, etc.) AF2-008 could receive cost allocation. Although Queue Project AF2-008 may not presently have cost responsibility for this upgrade, Queue Project AF2-008 may need this upgrade in-service to be deliverable to the PJM system. If Queue Project AF2-008 comes into service prior to completion of the upgrade, Queue Project AF2-008 will need an interim study. Cost allocation for 1.) <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$7.66 M)</th></tr><tr><td>AE2-130</td><td>104.51</td><td>0.242</td><td>1.856</td></tr><tr><td>AF1-088</td><td>217.9</td><td>0.505</td><td>3.870</td></tr><tr><td>AF2-008</td><td>109.0</td><td>0.253</td><td>1.935</td></tr></table> Cost allocation for 2.) <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$94 M)</th></tr><tr><td>AF1-088</td><td>217.9</td><td>0.667</td><td>62.668</td></tr><tr><td>AF2-008</td><td>109.0</td><td>0.333</td><td>31.332</td></tr></table>	Queue	MW contribution	Percentage of Cost	\$ cost (\$7.66 M)	AE2-130	104.51	0.242	1.856	AF1-088	217.9	0.505	3.870	AF2-008	109.0	0.253	1.935	Queue	MW contribution	Percentage of Cost	\$ cost (\$94 M)	AF1-088	217.9	0.667	62.668	AF2-008	109.0	0.333	31.332			
Queue	MW contribution	Percentage of Cost	\$ cost (\$7.66 M)																															
AE2-130	104.51	0.242	1.856																															
AF1-088	217.9	0.505	3.870																															
AF2-008	109.0	0.253	1.935																															
Queue	MW contribution	Percentage of Cost	\$ cost (\$94 M)																															
AF1-088	217.9	0.667	62.668																															
AF2-008	109.0	0.333	31.332																															
95170279,9 5169597,95 169883	2	05FALL C 345.0 kV - AB2-028 TAP 345.0 kV Ckt 1	AEP AEP SE rating is 1409 MVA per AEP. No upgrade required. MISO IPL SE rating is 1195 MVA. The limiting element is station equipment (2000A CTs) owned by IPL at Fall Creek. Cost estimate is \$200K.	\$200,000	\$200,000	MISO																												

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number								
95169827,95169555	4	05SULLIVAN 345.0 kV - 05DEQUIN 345.0 kV Ckt 1	<u>AEP</u> Replace 5 Sub conductor 2156 ACSR 84/19 STD. Time Estimate: 24-36 months. Cost \$5M. PJM Network Upgrade: N7924 <u>Note:</u> AF2-008 is the driver for this upgrade. Cost allocation: <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$5M)</th></tr><tr><td>AF2-008</td><td>73.06</td><td>1.000</td><td>5.000</td></tr></table>	Queue	MW contribution	Percentage of Cost	\$ cost (\$5M)	AF2-008	73.06	1.000	5.000	\$5,000,000	\$5,000,000	N7924
Queue	MW contribution	Percentage of Cost	\$ cost (\$5M)											
AF2-008	73.06	1.000	5.000											
98608233	12	06CLIFTY 345.0 kV - 06DEARB1 345.0 kV Ckt 1	<u>OVEC</u> Replace one 1600 A Wavetrap at Clifty Creek, \$200k, 12-18 months. The new SE rating is 1281 MVA SE. PJM Network Upgrade: N7979. <u>Note:</u> Since the cost of the upgrades are less than \$5M, based on PJM cost allocation criteria, AF2-008 currently does not receive cost allocation towards this upgrade. As changes to the PJM queue process occur (such as prior queued projects withdrawing from the queue, reducing in size, etc.) AF2-008 could receive cost allocation. Although Queue Project AF2-008 may not presently have cost responsibility for this upgrade, Queue Project AF2-008 may need this upgrade in-service to be deliverable to the PJM system. If Queue Project AF2-008 comes into service prior to completion of the upgrade, Queue Project AF2-008 will need an interim study.	\$200,000	\$0	N7979								

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number																				
95169435,95169691,95169687	3	05SULLIVAN 345.0 kV - J1180 TAP 345.0 kV Ckt 1	<u>AEP</u> 1.) AEP end cost estimate for about 0.9 miles of the line and adding two breakers to accommodate the new line is \$4M. PJM Network Upgrade: N7204. <u>MISO</u> 2.) MISO Recommended Upgrade: Upgrade is to build a second parallel Breed – Casey 345 kV line. \$60-74M (AMIL owns like 97% of the line, estimate for entire line of about 28 miles). Time estimate is 5 years for obtaining permits and line construction, per MISO. Cost Allocation for 1.) and 2.): <table><tr><th>Queue</th><th>MW Contribution</th><th>Percentage of cost</th><th>Cost (\$78 M)</th></tr><tr><td>AF1-088</td><td>256.85</td><td>38.57%</td><td>30.083</td></tr><tr><td>AF1-296</td><td>17.5</td><td>2.63%</td><td>2.050</td></tr><tr><td>AF1-318</td><td>25.8</td><td>3.87%</td><td>3.022</td></tr><tr><td>AF2-008</td><td>365.81</td><td>54.93%</td><td>42.845</td></tr></table>	Queue	MW Contribution	Percentage of cost	Cost (\$78 M)	AF1-088	256.85	38.57%	30.083	AF1-296	17.5	2.63%	2.050	AF1-318	25.8	3.87%	3.022	AF2-008	365.81	54.93%	42.845	\$4,000,000 + \$74,000,000	\$42,845,000	N7204 MISO
Queue	MW Contribution	Percentage of cost	Cost (\$78 M)																							
AF1-088	256.85	38.57%	30.083																							
AF1-296	17.5	2.63%	2.050																							
AF1-318	25.8	3.87%	3.022																							
AF2-008	365.81	54.93%	42.845																							
96032273,96032272	17	22-087 TAP 345.0 kV - PONTIAC ; R 345.0 kV Ckt 1	<u>ComEd</u> ComEd SSTE is 1837 MVA. Perform sag mitigation on the line 30 months. A preliminary cost estimate for this upgrade is \$10.5 M with a preliminary construction timeline of 30 months. PJM Network Upgrade: N7941 Cost allocation: <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$10.5 M)</th></tr><tr><td>J1139</td><td>19.2</td><td>18.13%</td><td>1.9040</td></tr><tr><td>AF1-088</td><td>57.5</td><td>54.31%</td><td>5.7022</td></tr><tr><td>AF2-008</td><td>29.18</td><td>27.56%</td><td>2.8937</td></tr></table>	Queue	MW contribution	Percentage of Cost	\$ cost (\$10.5 M)	J1139	19.2	18.13%	1.9040	AF1-088	57.5	54.31%	5.7022	AF2-008	29.18	27.56%	2.8937	\$10,500,000	\$2,893,700	N7941				
Queue	MW contribution	Percentage of Cost	\$ cost (\$10.5 M)																							
J1139	19.2	18.13%	1.9040																							
AF1-088	57.5	54.31%	5.7022																							
AF2-008	29.18	27.56%	2.8937																							

95169460,9 5169461	7	05JEFRSO 345.0 kV - 06CLIFTY 345.0 kV Ckt Z1	<u>AEP</u>			
			1.) Replace 4 Clifty switches. Time estimate 12-18 months 2354 MVA/2354 MVA SN/SE. \$2M. PJM Network Upgrade: N4106.1			
			2.) Reconductor the 0.75 mile line. Time estimate 24-36 months. 2365 MVA/2826 MVA SN/SE. \$1.96M. PJM Network Upgrade: N4106.4			
			3.) Replace Clifty Bus 5"0 AL Tubular Sch 40. Time Estimate: 12-18 months. 3113 MVA/3113 MVA SN/SE. PJM Network Upgrade: N4106.5			
			4.) Replace Jefferson Breaker (5000A). Time Estimate 12-18 months. 3290 MVA/3290 MVA SE. PJM Network Upgrade: N4106.6 <u>Note:</u> AF2-008 is the driver for this upgrade.			
			5.) An engineering study to determine if the Jefferson Relay Compliance Trip limits 5506 Amps settings can be adjusted. Time Estimate 12-18 months. 3426 MVA/3581 MVA SE. PJM Network Upgrade: N4106.7 <u>Note:</u> AF2-008 is the driver for this upgrade.	\$2,000,000	\$0	N4106.1
				+	+	
			\$1,960,000	\$0	N4106.4	
			+	+		
			\$100,000	\$0	N4106.5	
+	+					
\$1,200,000	\$1,200,000	N4106.6				
+	+					
\$25,000	\$25,000	N4106.7				
	=					
	\$1,225,000					
Cost allocation for 4) and 5):						
Queue	MW contribution	Percentage of Cost	\$ cost (\$1.225 M)			
AF2-008	234.46	100.000	1.225			

95169523,9 5169522,95 170215,951 69794,9516 9795,95170 216	1	05ROCKPT 765.0 kV - 05JEFRSO 765.0 kV Ckt 1	<u>AEP</u> 1.) Rockport & Jefferson Relay Thermal Limits - An engineering study will need to be conducted to determine if the Relay Thermal limits settings (2996 A/3970 MVA) can be adjusted to mitigate the overload. New relay packages will be required if the settings cannot be adjusted. Estimated Cost for study: \$50,000 (\$25,000 each). Estimated Cost for new relay packages: \$1.2 M (\$600,000 each). New SE rating 3975 MVA. PJM Network Upgrade: N6497.1			
			2.) Replace 6 Rockport 3000A CTs. \$4.8 M. New SE rating 4142 MVA. PJM Network Upgrade: N6497.2			
			3.) Replace 2 Rockport 3000A non-oil Breakers at Rockport. \$6 M. New SE rating 4571 MVA. PJM Network Upgrade: N6497.3			
			4.) Replace 3, 3000A wave traps at Rockport and 3, 3000A wave traps at Jefferson. \$300 K. New SE rating 5001 MVA. PJM Network Upgrade: N6497.4	\$1,200,000 +	\$0 +	N6497.1
			5.) Replace 12, 3000A switches at Rockport. \$6 M. New SE rating 5523 MVA. PJM Network Upgrade: N6497.5	\$4,800,000 +	\$0 +	N6497.2
			<u>Note:</u> AF2-008 is the driver for this upgrade.	\$6,000,000 +	\$3,055,000 +	N6497.3

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number																								
			Cost allocation for 3.)<table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$6 M)</th></tr><tr><td>AF1-088</td><td>278.0</td><td>0.426</td><td>2.555</td></tr><tr><td>AF1-204</td><td>42.5</td><td>0.065</td><td>0.391</td></tr><tr><td>AF2-008</td><td>332.38</td><td>0.509</td><td>3.055</td></tr></table> Cost allocation for 5)<table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$6 M)</th></tr><tr><td>AF2-008</td><td>332.38</td><td>1.000</td><td>6.000</td></tr></table>	Queue	MW contribution	Percentage of Cost	\$ cost (\$6 M)	AF1-088	278.0	0.426	2.555	AF1-204	42.5	0.065	0.391	AF2-008	332.38	0.509	3.055	Queue	MW contribution	Percentage of Cost	\$ cost (\$6 M)	AF2-008	332.38	1.000	6.000			
Queue	MW contribution	Percentage of Cost	\$ cost (\$6 M)																											
AF1-088	278.0	0.426	2.555																											
AF1-204	42.5	0.065	0.391																											
AF2-008	332.38	0.509	3.055																											
Queue	MW contribution	Percentage of Cost	\$ cost (\$6 M)																											
AF2-008	332.38	1.000	6.000																											
96032200,9 6032201	13	LORETTO ; B 345.0 kV - AE1-172 TAP 345.0 kV Ckt 1	<u>ComEd</u> ComEd SSTE rating is 2107 MVA. Replace-4-345kV circuit breakers, upgrade a line relay scheme, station conductor upgrades at both terminals and reconductor a portion of the line. Time estimate: 24-30 months. PJM Network Upgrade: N7207 <u>Note:</u> AF2-008 is the driver for this upgrade.	\$47,000,000	\$47,000,000	N7207																								
96032187,9 6032186	19	AE1-172 TAP 345.0 kV - AD1-100 TAP 345.0 kV Ckt 1	Cost allocation:<table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$47M)</th></tr><tr><td>AF2-008</td><td>28.95</td><td>100.00%</td><td>47.0000</td></tr></table>				Queue	MW contribution	Percentage of Cost	\$ cost (\$47M)	AF2-008	28.95	100.00%	47.0000																
Queue	MW contribution	Percentage of Cost	\$ cost (\$47M)																											
AF2-008	28.95	100.00%	47.0000																											

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number
98608456,98608457	16	7TRIMBL REAC 345.0 kV - 06CLIFTY 345.0 kV Ckt 1	<u>OVEC/LG&E:</u> A potential constraint was identified by PJM on the Trimble – Clifty 345 kV line (LG&E/OVEC tie line).The upgrade (LG&E) on the Trimble – Clifty 345 kV line, if determined to be a constraint by LG&E, is to reconductor the line with a high temperature conductor and upgrade necessary terminal equipment to achieve ratings of 2610/2610 MVA SN/SE. Cost estimate is \$17.4M with a time estimate of 18 months. An LG&E affected system study may be required (LG&E should be consulted to determine if they need to evaluate these MISO queue projects for LG&E impacts) to determine if the MISO queue project causes any impacts on the LG&E system, including the Trimble-Clifty LG&E-OVEC tie line.	\$17,400,000	\$17,400,000	LG&E

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgra de Numb er																												
96032219,96032218	14	PONTIAC ; B 345.0 kV - LORETTO ; B 345.0 kV Ckt 1	ComEd ComEd SSTE Rating is 1846 MVA. 1.) Replace the Pontiac 345 kV breaker BT 4-5. Cost Estimate is \$4M. Time estimate is 24 months. PJM Network Upgrade: N6260.1 2.) Replace 345kV line disconnect switch. 24 months. \$1M with an estimated construction timeline of 24 months. PJM Network Upgrade: N6260.2 Cost allocation for 1.) and 2.): <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$ 5M)</th></tr><tr><td>AD1-133</td><td>90.8</td><td>23.97%</td><td>1.1985</td></tr><tr><td>AD2-100</td><td>23.1</td><td>6.10%</td><td>0.3049</td></tr><tr><td>AE1-205</td><td>42.5</td><td>11.22%</td><td>0.5610</td></tr><tr><td>J955</td><td>175.7</td><td>46.38%</td><td>2.3192</td></tr><tr><td>J1139</td><td>17.6</td><td>4.65%</td><td>0.2323</td></tr><tr><td>AF2-008</td><td>29.1</td><td>7.68%</td><td>0.3841</td></tr></table>	Queue	MW contribution	Percentage of Cost	\$ cost (\$ 5M)	AD1-133	90.8	23.97%	1.1985	AD2-100	23.1	6.10%	0.3049	AE1-205	42.5	11.22%	0.5610	J955	175.7	46.38%	2.3192	J1139	17.6	4.65%	0.2323	AF2-008	29.1	7.68%	0.3841	\$4,000,000 + \$1,000,000	\$384,100	N6260.1 N6260.2
Queue	MW contribution	Percentage of Cost	\$ cost (\$ 5M)																															
AD1-133	90.8	23.97%	1.1985																															
AD2-100	23.1	6.10%	0.3049																															
AE1-205	42.5	11.22%	0.5610																															
J955	175.7	46.38%	2.3192																															
J1139	17.6	4.65%	0.2323																															
AF2-008	29.1	7.68%	0.3841																															
95169562	8	05JEFRSO 765.0 kV - 05JEFRSO 345.0 kV Ckt 2	AEP 1.) Replace 765/345 Transformer. 12-18 months. SN/SE 3113/3113MVA \$6M. PJM Network Upgrade: N7964 Cost allocation for 1.): <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$ 6 M)</th></tr><tr><td>AF1-088</td><td>255.73</td><td>52.17</td><td>\$3.13</td></tr><tr><td>AF2-008</td><td>234.46</td><td>47.83</td><td>\$2.87</td></tr></table> 2.) Replace Jefferson 345kV Circuit Breaker (5000A) for 1.2 M SN/SE 3426/3582 MVA. PJM Network Upgrade: N7943.2 Note: AF2-008 is the driver for this upgrade.	Queue	MW contribution	Percentage of Cost	\$ cost (\$ 6 M)	AF1-088	255.73	52.17	\$3.13	AF2-008	234.46	47.83	\$2.87	\$6,000,000 + \$1,200,000	\$2,870,000 + \$1,200,000 = \$4,070,000	N7964 N7943.2																
Queue	MW contribution	Percentage of Cost	\$ cost (\$ 6 M)																															
AF1-088	255.73	52.17	\$3.13																															
AF2-008	234.46	47.83	\$2.87																															

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgra de Numb er																									
96032228,9 6032229	15	PONTIAC ; R 345.0 kV - AD1-133 TAP 345.0 kV Ckt 1	<u>ComEd</u> ComEd SSTE Rating is 1797 MVA. Perform sag mitigation on the 345kV line, upgrade station conductor at a line terminal, upgrade 2 breakers, 2 disconnect switches, and CTs. A preliminary estimate for this work is \$20.5 M with an estimated construction timeline of 30 months. PJM Network Upgrade: N6261	\$20,500,000	\$1,491,000	N6261																									
96032211,9 6032210	18	AD1-133 TAP 345.0 kV - DRESDEN ; R 345.0 kV Ckt 1	Cost allocation: <table><tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>\$ cost (\$20.5 M)</th></tr><tr><td>J955</td><td>162.70</td><td>44.18%</td><td>\$9.056</td></tr><tr><td>AE2-173</td><td>23.36</td><td>6.34%</td><td>\$1.300</td></tr><tr><td>AE2-223</td><td>69.79</td><td>18.95%</td><td>\$3.885</td></tr><tr><td>AE2-261</td><td>32.2</td><td>8.74%</td><td>\$1.792</td></tr><tr><td>AF1-088</td><td>53.47</td><td>14.52%</td><td>\$2.976</td></tr><tr><td>AF2-008</td><td>26.78</td><td>7.27%</td><td>\$1.491</td></tr></table>				Queue	MW contribution	Percentage of Cost	\$ cost (\$20.5 M)	J955	162.70	44.18%	\$9.056	AE2-173	23.36	6.34%	\$1.300	AE2-223	69.79	18.95%	\$3.885	AE2-261	32.2	8.74%	\$1.792	AF1-088	53.47	14.52%	\$2.976	AF2-008
Queue	MW contribution	Percentage of Cost	\$ cost (\$20.5 M)																												
J955	162.70	44.18%	\$9.056																												
AE2-173	23.36	6.34%	\$1.300																												
AE2-223	69.79	18.95%	\$3.885																												
AE2-261	32.2	8.74%	\$1.792																												
AF1-088	53.47	14.52%	\$2.976																												
AF2-008	26.78	7.27%	\$1.491																												

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number
95169498	11	05SULLIVAN 345.0 kV - 16PETE 345.0 kV Ckt 1	AEP A sag study will be required on the ~0.5 miles section of 954 2x Rail Conductor section 2 to mitigate the overload. PJM Network Upgrade: N6781 Note: Since the cost of the upgrade is less than \$5M, based on PJM cost allocation criteria, AF2-008 currently does not receive cost allocation towards this upgrade. As changes to the PJM queue process occur (such as prior queued projects withdrawing from the queue, reducing in size, etc.) AF2-008 could receive cost allocation. Although Queue Project AF2-008 may not presently have cost responsibility for this upgrade, Queue Project AF2-008 may need this upgrade in-service to be deliverable to the PJM system. If Queue Project AF2-008 comes into service prior to completion of the upgrade, Queue Project AF2-008 will need an interim study.	\$25,000	\$0	N6781
			TOTAL COST	\$320,270,000	\$164,830,800	

Note : For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

10.7 Flow Gate Details

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".

10.7.1 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
95170216	243209	05ROCKPT	AEP	243208	05JEFRSO	AEP	1	AEP_P7-1_#11042-A	tower	3970.0	117.85	129.01	AC	332.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	145.7481	50/50	145.7481
243443	05RKG2	143.5398	50/50	143.5398
243859	05FR-11G C	0.6221	50/50	0.6221
243862	05FR-12G C	0.6126	50/50	0.6126
243864	05FR-21G C	0.6538	50/50	0.6538
243866	05FR-22G C	0.6252	50/50	0.6252
243870	05FR-3G C	1.2664	50/50	1.2664
243873	05FR-4G C	0.9807	50/50	0.9807
246909	05MDL-1G C	1.2695	50/50	1.2695
246910	05MDL-2G C	0.6284	50/50	0.6284
246976	05MDL-3G C	0.6411	50/50	0.6411
246979	05MDL-4G C	0.6252	50/50	0.6252
247556	T-127 C	0.6347	50/50	0.6347
247900	05FR-11G E	14.2584	50/50	14.2584
247901	05FR-12G E	14.0217	50/50	14.0217
247902	05FR-21G E	14.9868	50/50	14.9868
247903	05FR-22G E	14.3495	50/50	14.3495
247904	05FR-3G E	29.0632	50/50	29.0632
247905	05FR-4G E	22.7625	50/50	22.7625
247906	05MDL-1G E	29.0798	50/50	29.0798
247907	05MDL-2G E	14.5672	50/50	14.5672
247912	05MDL-3G E	14.5672	50/50	14.5672
247913	05MDL-4G E	14.5672	50/50	14.5672
247943	T-127 E	14.5672	50/50	14.5672
274650	KINCAID ;1U	10.5695	50/50	10.5695
930041	AB1-006 C	0.8252	50/50	0.8252
930042	AB1-006 E	31.6837	50/50	31.6837
930461	AB1-087	182.8090	50/50	182.8090
930471	AB1-088	182.8090	50/50	182.8090
933441	AC2-157 C	25.2609	50/50	25.2609
933442	AC2-157 E	41.2151	50/50	41.2151

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936771	AD2-100 C	14.2229	50/50	14.2229
936772	AD2-100 E	9.4819	50/50	9.4819
936971	AD2-131 C	0.9369	50/50	0.9369
936972	AD2-131 E	4.7071	50/50	4.7071
941341	AE2-130 C	304.0848	50/50	304.0848
941342	AE2-130 E	202.7232	50/50	202.7232
941571	AE2-154 C	5.9179	50/50	5.9179
941572	AE2-154 E	39.6046	50/50	39.6046
942481	AE2-261 C	19.7519	50/50	19.7519
942482	AE2-261 E	13.1680	50/50	13.1680
942601	AE2-276	16.6190	50/50	16.6190
944201	AF1-088 FTIR	332.3800	50/50	332.3800
944221	AF1-090 C O1	4.2603	50/50	4.2603
944222	AF1-090 E O1	19.9457	50/50	19.9457
945391	AF1-204 C O1	10.6144	50/50	10.6144
945392	AF1-204 E O1	31.8431	50/50	31.8431
945871	AF1-252 O1	7.5523	50/50	7.5523
945881	AF1-253 O1	5.2285	50/50	5.2285
946581	AF1-322 C	15.2956	50/50	15.2956
946582	AF1-322 E	21.1224	50/50	21.1224
954681	J949 C	18.6337	PJM External (MISO)	18.6337
954761	J468 C	3.0894	PJM External (MISO)	3.0894
954762	J468 E	17.5065	PJM External (MISO)	17.5065
957141	AF2-008 FTIR	166.1900	50/50	166.1900
957142	AF2-008 NFTI	166.1900	50/50	166.1900
957381	AF2-032 C	1.4834	50/50	1.4834
957382	AF2-032 E	0.6980	50/50	0.6980
958971	AF2-188 C O1	12.2364	50/50	12.2364
958972	AF2-188 E O1	8.1576	50/50	8.1576
WEC	WEC	1.3942	Confirmed LTF	1.3942
LGEE	LGEE	0.2630	Confirmed LTF	0.2630
CBM-W2	CBM-W2	61.1302	Confirmed LTF	61.1302
NY	NY	1.0562	Confirmed LTF	1.0562
TVA	TVA	5.2542	Confirmed LTF	5.2542
O-066	O-066	12.4522	Confirmed LTF	12.4522
CBM-S1	CBM-S1	26.7698	Confirmed LTF	26.7698

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
G-007	G-007	1.9261	Confirmed LTF	1.9261
MADISON	MADISON	16.9142	Confirmed LTF	16.9142
MEC	MEC	10.3206	Confirmed LTF	10.3206
BLUEG	BLUEG	0.3680	Confirmed LTF	0.3680
TRIMBLE	TRIMBLE	0.4808	Confirmed LTF	0.4808
CATAWBA	CATAWBA	0.0486	Confirmed LTF	0.0486
CBM-W1	CBM-W1	42.4339	Confirmed LTF	42.4339

10.7.2 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
95169597	243222	05FALL C	AEP	923880	AB2-028 TAP	AEP	1	AEP_P4_#8648_05JEFRSO 765_B	breaker	1195.0	93.94	100.55	AC	79.99

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
247285	05AND G1	1.1509	50/50	1.1509
247286	05AND G2	1.1509	50/50	1.1509
247287	05AND G3	2.4071	50/50	2.4071
930461	AB1-087	37.3953	Adder	43.99
930471	AB1-088	37.3953	Adder	43.99
933441	AC2-157 C	5.1674	Adder	6.08
933442	AC2-157 E	8.4309	Adder	9.92
934161	AD1-043 C O1	2.7477	Adder	3.23
934162	AD1-043 E O1	4.4831	Adder	5.27
941341	AE2-130 C	32.6237	Adder	38.38
941342	AE2-130 E	21.7491	Adder	25.59
941692	AE2-169 BAT	1.9506	Merchant Transmission	1.9506
941722	AE2-172 BAT	2.6380	Merchant Transmission	2.6380
942601	AE2-276	3.3996	Adder	4.0
942791	AE2-297 C O1	9.9415	50/50	9.9415
942792	AE2-297 E O1	6.6276	50/50	6.6276
944201	AF1-088 FTIR	79.9900	Merchant Transmission	79.9900
945391	AF1-204 C O1	4.5214	Adder	5.32
945392	AF1-204 E O1	13.5642	Adder	15.96
953351	J805	32.2221	PJM External (MISO)	32.2221
953761	J829	15.6425	PJM External (MISO)	15.6425
953931	J856	4.4896	PJM External (MISO)	4.4896
954351	J903	15.6520	PJM External (MISO)	15.6520
954772	J515 E	23.3320	PJM External (MISO)	23.3320

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
955151	J993	37.4440	PJM External (MISO)	37.4440
955451	J1027	10.1265	PJM External (MISO)	10.1265
955461	J1028	9.5055	PJM External (MISO)	9.5055
955891	J1074	12.1960	PJM External (MISO)	12.1960
956561	J1152	36.6860	PJM External (MISO)	36.6860
956911	J1189	0.3659	PJM External (MISO)	0.3659
957141	AF2-008 FTIR	39.9950	Merchant Transmission	39.9950
957142	AF2-008 NFTI	39.9950	Merchant Transmission	39.9950
957961	AF2-090 C	3.2344	Adder	3.81
957962	AF2-090 E	1.5996	Adder	1.88
961001	AF2-391 C O1	3.0845	Adder	3.63
961002	AF2-391 E O1	2.0563	Adder	2.42
961161	AF2-407	118.1520	50/50	118.1520
961171	AF2-408	19.6496	50/50	19.6496
WEC	WEC	0.4703	Confirmed LTF	0.4703
LGEE	LGEE	2.4919	Confirmed LTF	2.4919
CPL	CPL	0.5431	Confirmed LTF	0.5431
CBM-W2	CBM-W2	42.0557	Confirmed LTF	42.0557
NY	NY	0.2212	Confirmed LTF	0.2212
TVA	TVA	4.3442	Confirmed LTF	4.3442
O-066	O-066	2.4326	Confirmed LTF	2.4326
CBM-S2	CBM-S2	6.6759	Confirmed LTF	6.6759
CBM-S1	CBM-S1	28.4398	Confirmed LTF	28.4398
G-007	G-007	0.3734	Confirmed LTF	0.3734
MADISON	MADISON	7.2596	Confirmed LTF	7.2596
MEC	MEC	4.3968	Confirmed LTF	4.3968
CBM-W1	CBM-W1	12.5350	Confirmed LTF	12.5350

10.7.3 Index 3

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 IMPAC T
95169435	247712	05SULLIVAN	AEP	956820	J1180 TAP	AMIL	1	AEP_P4_#8648_05JEFRS O 765_B	breaker	1466.0	140.21	165.08	DC	365.81

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	84.1806	50/50	84.1806
243443	05RKG2	82.9051	50/50	82.9051
247900	05FR-11G E	3.4063	Adder	4.01
247901	05FR-12G E	3.3497	Adder	3.94
247902	05FR-21G E	3.5803	Adder	4.21
247903	05FR-22G E	3.4280	Adder	4.03
247904	05FR-3G E	6.9431	Adder	8.17
247905	05FR-4G E	5.4379	Adder	6.4
276153	W2-048 E	-4.4333	Adder	-5.22
909052	X2-022 E	-13.3353	Adder	-15.69
924041	AB2-047 C O1	-1.5092	Adder	-1.78
930461	AB1-087	201.1955	50/50	201.1955
930471	AB1-088	201.1955	50/50	201.1955
933441	AC2-157 C	27.8016	50/50	27.8016
933442	AC2-157 E	45.3604	50/50	45.3604
936973	AD2-131 BAT	5.5015	50/50	5.5015
941341	AE2-130 C	175.6320	50/50	175.6320
941342	AE2-130 E	117.0880	50/50	117.0880
941732	AE2-173 BAT	2.7315	Merchant Transmission	2.7315
942601	AE2-276	18.2905	50/50	18.2905
944201	AF1-088 FTIR	365.8100	50/50	365.8100
945872	AF1-252 BAT	7.6958	50/50	7.6958
945882	AF1-253 BAT	5.3279	50/50	5.3279
951731	J446 C	1.8037	PJM External (MISO)	1.8037
951732	J446 E	9.7583	PJM External (MISO)	9.7583
951811	J513 C	0.9598	PJM External (MISO)	0.9598
951812	J513 E	5.1928	PJM External (MISO)	5.1928

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952811	J759	4.4303	PJM External (MISO)	4.4303
952861	J783 C	4.2074	PJM External (MISO)	4.2074
952862	J783 E	0.1753	PJM External (MISO)	0.1753
953161	J837 C	2.1582	PJM External (MISO)	2.1582
953162	J837 E	11.6767	PJM External (MISO)	11.6767
953171	J838 C	1.0786	PJM External (MISO)	1.0786
953172	J838 E	5.8354	PJM External (MISO)	5.8354
953351	J805	14.3081	PJM External (MISO)	14.3081
953931	J856	5.4616	PJM External (MISO)	5.4616
954171	J883 C	0.7006	PJM External (MISO)	0.7006
954172	J883 E	3.7906	PJM External (MISO)	3.7906
954351	J903	6.8380	PJM External (MISO)	6.8380
954421	J913 C	11.0624	PJM External (MISO)	11.0624
954772	J515 E	27.0280	PJM External (MISO)	27.0280
954941	J968 C	2.1572	PJM External (MISO)	2.1572
954942	J968 E	11.6708	PJM External (MISO)	11.6708
955141	J992	10.0940	PJM External (MISO)	10.0940
955151	J993	14.2800	PJM External (MISO)	14.2800
955451	J1027	13.0290	PJM External (MISO)	13.0290
955461	J1028	12.3435	PJM External (MISO)	12.3435

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
955791	J1063	17.6100	PJM External (MISO)	17.6100
955821	J1067	13.9128	PJM External (MISO)	13.9128
955841	J1069 C	2.1572	PJM External (MISO)	2.1572
955842	J1069 E	11.6708	PJM External (MISO)	11.6708
955891	J1074	14.8840	PJM External (MISO)	14.8840
956561	J1152	14.4720	PJM External (MISO)	14.4720
956911	J1189	0.2974	PJM External (MISO)	0.2974
957141	AF2-008 FTIR	182.9050	50/50	182.9050
957142	AF2-008 NFTI	182.9050	50/50	182.9050
959613	AF2-252 BAT	3.5010	Merchant Transmission	3.5010
960613	AF2-352 BAT	3.5010	Merchant Transmission	3.5010
LGEE	LGEE	0.7456	Confirmed LTF	0.7456
NEWTON	NEWTON	26.3715	Confirmed LTF	26.3715
FARMERCITY	FARMERCITY	0.3819	Confirmed LTF	0.3819
NY	NY	0.0149	Confirmed LTF	0.0149
PRAIRIE	PRAIRIE	31.2517	Confirmed LTF	31.2517
O-066	O-066	0.4368	Confirmed LTF	0.4368
COFFEEN	COFFEEN	3.1008	Confirmed LTF	3.1008
CHEOAH	CHEOAH	1.0921	Confirmed LTF	1.0921
EDWARDS	EDWARDS	1.8785	Confirmed LTF	1.8785
TILTON	TILTON	1.4566	Confirmed LTF	1.4566
G-007	G-007	0.0686	Confirmed LTF	0.0686
LGE-TSR-0092018	LGE-TSR-0092018	0.0000	LTF	0.0000
CALDERWOOD	CALDERWOOD	1.0959	Confirmed LTF	1.0959
CATAWBA	CATAWBA	0.4862	Confirmed LTF	0.4862
AC1-056	AC1-056	11.9440	LTF	11.9440

10.7.4 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 IMPAC T
95169555	247712	05SULLIVAN	AEP	243217	05DEQUIN	AEP	1	AEP_P4_#8648_05JEFRS O 765_B	breaker	1318.0	101.24	112.37	DC	146.79

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	33.7689	50/50	33.7689
243443	05RKG2	33.2572	50/50	33.2572
930461	AB1-087	80.7345	50/50	80.7345
930471	AB1-088	80.7345	50/50	80.7345
933441	AC2-157 C	11.1560	50/50	11.1560
933442	AC2-157 E	18.2020	50/50	18.2020
941341	AE2-130 C	70.4544	50/50	70.4544
941342	AE2-130 E	46.9696	50/50	46.9696
942601	AE2-276	7.3395	50/50	7.3395
944201	AF1-088 FTIR	146.7900	50/50	146.7900
957141	AF2-008 FTIR	73.3950	50/50	73.3950
957142	AF2-008 NFTI	73.3950	50/50	73.3950
957843	AF2-078 BAT	1.2350	Merchant Transmission	1.2350
LGEE	LGEE	0.9687	Confirmed LTF	0.9687
CPL	CPL	0.2560	Confirmed LTF	0.2560
CBM-W2	CBM-W2	20.1884	Confirmed LTF	20.1884
NY	NY	0.1178	Confirmed LTF	0.1178
TVA	TVA	2.3926	Confirmed LTF	2.3926
O-066	O-066	1.3373	Confirmed LTF	1.3373
CBM-S2	CBM-S2	3.2888	Confirmed LTF	3.2888
CBM-S1	CBM-S1	14.5436	Confirmed LTF	14.5436
G-007	G-007	0.2059	Confirmed LTF	0.2059
MADISON	MADISON	1.6975	Confirmed LTF	1.6975
MEC	MEC	1.9831	Confirmed LTF	1.9831

10.7.5 Index 5

None.

10.7.6 Index 6

None.

10.7.7 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 %	AC/D C	MW IMPAC T
95169460	242865	05JEFRS O	AEP	248000	06CLIFT Y	OVE C	Z1	AEP_P4_#1760_05JEFRS O 765_A	breaker	2354.0	131.57	142.54	AC	234.46

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	109.9294	50/50	109.9294
243443	05RKG2	108.2638	50/50	108.2638
247900	05FR-11G E	5.2412	Adder	6.17
247901	05FR-12G E	5.1542	Adder	6.06
247902	05FR-21G E	5.5090	Adder	6.48
247903	05FR-22G E	5.2747	Adder	6.21
247904	05FR-3G E	10.6832	Adder	12.57
247905	05FR-4G E	8.3672	Adder	9.84
247906	05MDL-1G E	9.1546	Adder	10.77
247907	05MDL-2G E	4.5859	Adder	5.4
247912	05MDL-3G E	4.5859	Adder	5.4
247913	05MDL-4G E	4.5859	Adder	5.4
247943	T-127 E	4.5859	Adder	5.4
250163	Y3-099 BAT	0.1382	Merchant Transmission	0.1382
250167	Y3-100 BAT	0.1382	Merchant Transmission	0.1382
251823	Z1-065 BAT	0.3605	Merchant Transmission	0.3605
274882	W4-005 E	17.0299	Adder	20.04
274890	CAYUG;1U E	6.1180	Adder	7.2
274891	CAYUG;2U E	6.1180	Adder	7.2
276153	W2-048 E	4.1299	Adder	4.86
290261	S-027 E	9.6389	Adder	11.34
290265	S-028 E	9.6389	Adder	11.34
909052	X2-022 E	12.4229	Adder	14.62
913222	Y1-054 E	-1.0950	Adder	-1.29
917502	Z2-087 E	9.5041	Adder	11.18
924041	AB2-047 C O1	1.7752	Adder	2.09
924042	AB2-047 E O1	11.8801	Adder	13.98
924261	AB2-070 C O1	1.6971	Adder	2.0
924262	AB2-070 E O1	11.3572	Adder	13.36

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925771	AC1-053 C	1.7037	Adder	2.0
925772	AC1-053 E	11.4016	Adder	13.41
926841	AC1-171 C O1	0.5460	Adder	0.64
926842	AC1-171 E O1	3.6474	Adder	4.29
930042	AB1-006 E	9.9744	Adder	11.73
930461	AB1-087	128.9530	50/50	128.9530
930471	AB1-088	128.9530	50/50	128.9530
933441	AC2-157 C	17.8190	50/50	17.8190
933442	AC2-157 E	29.0730	50/50	29.0730
935141	AD1-148	3.2379	Adder	3.81
936771	AD2-100 C	9.0146	Adder	10.61
936772	AD2-100 E	6.0097	Adder	7.07
936971	AD2-131 C	0.5938	Adder	0.7
936972	AD2-131 E	2.9834	Adder	3.51
937211	AD2-159 C	2.1582	Adder	2.54
937212	AD2-159 E	10.1041	Adder	11.89
939741	AE1-205 C O1	4.5882	Adder	5.4
939742	AE1-205 E O1	6.3360	Adder	7.45
941341	AE2-130 C	229.3536	50/50	229.3536
941342	AE2-130 E	152.9024	50/50	152.9024
941571	AE2-154 C	1.8630	Adder	2.19
941572	AE2-154 E	12.4680	Adder	14.67
941731	AE2-173 O1	2.7310	Adder	3.21
942111	AE2-223 C	1.0651	Adder	1.25
942112	AE2-223 E	7.1280	Adder	8.39
942481	AE2-261 C	12.6231	Adder	14.85
942482	AE2-261 E	8.4154	Adder	9.9
942601	AE2-276	11.7230	50/50	11.7230
944201	AF1-088 FTIR	234.4600	50/50	234.4600
944221	AF1-090 C O1	2.6404	Adder	3.11
944222	AF1-090 E O1	12.3621	Adder	14.54
945391	AF1-204 C O1	6.4419	50/50	6.4419
945392	AF1-204 E O1	19.3258	50/50	19.3258
945421	AF1-207 C	1.7993	Adder	2.12
945422	AF1-207 E	7.7265	Adder	9.09
945871	AF1-252 O1	4.6808	Adder	5.51
945881	AF1-253 O1	3.2405	Adder	3.81
946581	AF1-322 C	4.8152	Adder	5.66
946582	AF1-322 E	6.6496	Adder	7.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
954681	J949 C	11.0534	PJM External (MISO)	11.0534
954761	J468 C	1.7980	PJM External (MISO)	1.7980
954762	J468 E	10.1887	PJM External (MISO)	10.1887
957141	AF2-008 FTIR	117.2300	50/50	117.2300
957142	AF2-008 NFTI	117.2300	50/50	117.2300
957381	AF2-032 C	0.9509	Adder	1.12
957382	AF2-032 E	0.4475	Adder	0.53
957841	AF2-078 C O1	6.3505	Adder	7.47
957842	AF2-078 E O1	4.2337	Adder	4.98
958971	AF2-188 C O1	3.5757	Adder	4.21
958972	AF2-188 E O1	2.3838	Adder	2.8
959341	AF2-225 C	3.4411	Adder	4.05
959342	AF2-225 E	4.7520	Adder	5.59
959611	AF2-252 C	1.2170	Adder	1.43
959612	AF2-252 E	1.8255	Adder	2.15
960141	AF2-305	0.6005	Adder	0.71
960261	AF2-317	1.0361	Adder	1.22
960611	AF2-352 C	1.2170	Adder	1.43
960612	AF2-352 E	1.8255	Adder	2.15
WEC	WEC	1.6279	Confirmed LTF	1.6279
CBM-W2	CBM-W2	34.8566	Confirmed LTF	34.8566
NY	NY	0.8732	Confirmed LTF	0.8732
TVA	TVA	1.8452	Confirmed LTF	1.8452
O-066	O-066	9.8112	Confirmed LTF	9.8112
CHEOAH	CHEOAH	0.0936	Confirmed LTF	0.0936
G-007	G-007	1.5194	Confirmed LTF	1.5194
MADISON	MADISON	23.2203	Confirmed LTF	23.2203
MEC	MEC	8.7236	Confirmed LTF	8.7236
CALDERWOOD	CALDERWOOD	0.0860	Confirmed LTF	0.0860
BLUEG	BLUEG	14.8550	Confirmed LTF	14.8550
TRIMBLE	TRIMBLE	5.3129	Confirmed LTF	5.3129
LGE-GI-0012019	LGE-GI-0012019	10.5017	LTF	10.5017
CATAWBA	CATAWBA	0.2579	Confirmed LTF	0.2579
CBM-W1	CBM-W1	46.1994	Confirmed LTF	46.1994

10.7.8 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 PROJECT LOADIN G %	POST PROJECT LOADIN G %	ACID C	MW IMPACT
95169562	243208	05JEFRS O	AEP	242865	05JEFRS O	AEP	2	AEP_P4_#1760_05JEFRS O 765_A	breaker	3039.0	103.59	112.24	AC	234.46

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	109.9294	50/50	109.9294
243443	05RKG2	108.2638	50/50	108.2638
247900	05FR-11G E	5.2412	Adder	6.17
247901	05FR-12G E	5.1542	Adder	6.06
247902	05FR-21G E	5.5090	Adder	6.48
247903	05FR-22G E	5.2747	Adder	6.21
247904	05FR-3G E	10.6832	Adder	12.57
247905	05FR-4G E	8.3672	Adder	9.84
247906	05MDL-1G E	9.1546	Adder	10.77
247907	05MDL-2G E	4.5859	Adder	5.4
247912	05MDL-3G E	4.5859	Adder	5.4
247913	05MDL-4G E	4.5859	Adder	5.4
247943	T-127 E	4.5859	Adder	5.4
250163	Y3-099 BAT	0.1382	Merchant Transmission	0.1382
250167	Y3-100 BAT	0.1382	Merchant Transmission	0.1382
251823	Z1-065 BAT	0.3605	Merchant Transmission	0.3605
274882	W4-005 E	17.0299	Adder	20.04
274890	CAYUG;1U E	6.1180	Adder	7.2
274891	CAYUG;2U E	6.1180	Adder	7.2
276153	W2-048 E	4.1299	Adder	4.86
290261	S-027 E	9.6389	Adder	11.34
290265	S-028 E	9.6389	Adder	11.34
909052	X2-022 E	12.4229	Adder	14.62
913222	Y1-054 E	-1.0950	Adder	-1.29
917502	Z2-087 E	9.5041	Adder	11.18
924041	AB2-047 C O1	1.7752	Adder	2.09
924042	AB2-047 E O1	11.8801	Adder	13.98
924261	AB2-070 C O1	1.6971	Adder	2.0
924262	AB2-070 E O1	11.3572	Adder	13.36

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925771	AC1-053 C	1.7037	Adder	2.0
925772	AC1-053 E	11.4016	Adder	13.41
926841	AC1-171 C O1	0.5460	Adder	0.64
926842	AC1-171 E O1	3.6474	Adder	4.29
930042	AB1-006 E	9.9744	Adder	11.73
930461	AB1-087	128.9530	50/50	128.9530
930471	AB1-088	128.9530	50/50	128.9530
933441	AC2-157 C	17.8190	50/50	17.8190
933442	AC2-157 E	29.0730	50/50	29.0730
935141	AD1-148	3.2379	Adder	3.81
936771	AD2-100 C	9.0146	Adder	10.61
936772	AD2-100 E	6.0097	Adder	7.07
936971	AD2-131 C	0.5938	Adder	0.7
936972	AD2-131 E	2.9834	Adder	3.51
937211	AD2-159 C	2.1582	Adder	2.54
937212	AD2-159 E	10.1041	Adder	11.89
939741	AE1-205 C O1	4.5882	Adder	5.4
939742	AE1-205 E O1	6.3360	Adder	7.45
941341	AE2-130 C	229.3536	50/50	229.3536
941342	AE2-130 E	152.9024	50/50	152.9024
941571	AE2-154 C	1.8630	Adder	2.19
941572	AE2-154 E	12.4680	Adder	14.67
941731	AE2-173 O1	2.7310	Adder	3.21
942111	AE2-223 C	1.0651	Adder	1.25
942112	AE2-223 E	7.1280	Adder	8.39
942481	AE2-261 C	12.6231	Adder	14.85
942482	AE2-261 E	8.4154	Adder	9.9
942601	AE2-276	11.7230	50/50	11.7230
944201	AF1-088 FTIR	234.4600	50/50	234.4600
944221	AF1-090 C O1	2.6404	Adder	3.11
944222	AF1-090 E O1	12.3621	Adder	14.54
945391	AF1-204 C O1	6.4419	50/50	6.4419
945392	AF1-204 E O1	19.3258	50/50	19.3258
945421	AF1-207 C	1.7993	Adder	2.12
945422	AF1-207 E	7.7265	Adder	9.09
945871	AF1-252 O1	4.6808	Adder	5.51
945881	AF1-253 O1	3.2405	Adder	3.81
946581	AF1-322 C	4.8152	Adder	5.66
946582	AF1-322 E	6.6496	Adder	7.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
954681	J949 C	11.0534	PJM External (MISO)	11.0534
954761	J468 C	1.7980	PJM External (MISO)	1.7980
954762	J468 E	10.1887	PJM External (MISO)	10.1887
957141	AF2-008 FTIR	117.2300	50/50	117.2300
957142	AF2-008 NFTI	117.2300	50/50	117.2300
957381	AF2-032 C	0.9509	Adder	1.12
957382	AF2-032 E	0.4475	Adder	0.53
957841	AF2-078 C O1	6.3505	Adder	7.47
957842	AF2-078 E O1	4.2337	Adder	4.98
958971	AF2-188 C O1	3.5757	Adder	4.21
958972	AF2-188 E O1	2.3838	Adder	2.8
959341	AF2-225 C	3.4411	Adder	4.05
959342	AF2-225 E	4.7520	Adder	5.59
959611	AF2-252 C	1.2170	Adder	1.43
959612	AF2-252 E	1.8255	Adder	2.15
960141	AF2-305	0.6005	Adder	0.71
960261	AF2-317	1.0361	Adder	1.22
960611	AF2-352 C	1.2170	Adder	1.43
960612	AF2-352 E	1.8255	Adder	2.15
WEC	WEC	1.6279	Confirmed LTF	1.6279
CBM-W2	CBM-W2	34.8566	Confirmed LTF	34.8566
NY	NY	0.8732	Confirmed LTF	0.8732
TVA	TVA	1.8452	Confirmed LTF	1.8452
O-066	O-066	9.8112	Confirmed LTF	9.8112
CHEOAH	CHEOAH	0.0936	Confirmed LTF	0.0936
G-007	G-007	1.5194	Confirmed LTF	1.5194
MADISON	MADISON	23.2203	Confirmed LTF	23.2203
MEC	MEC	8.7236	Confirmed LTF	8.7236
CALDERWOOD	CALDERWOOD	0.0860	Confirmed LTF	0.0860
BLUEG	BLUEG	14.8550	Confirmed LTF	14.8550
TRIMBLE	TRIMBLE	5.3129	Confirmed LTF	5.3129
LGE-GI-0012019	LGE-GI-0012019	10.5017	LTF	10.5017
CATAWBA	CATAWBA	0.2579	Confirmed LTF	0.2579
CBM-W1	CBM-W1	46.1994	Confirmed LTF	46.1994

10.7.9 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
95169450	243216	05DARWIN	AEP	243221	05EUGENE	AEP	1	AEP_P4_#8648_05JEFRS O 765_B	breaker	1160.0	135.52	154.33	DC	218.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	50.1978	50/50	50.1978
243443	05RKG2	49.4372	50/50	49.4372
930461	AB1-087	120.0100	50/50	120.0100
930471	AB1-088	120.0100	50/50	120.0100
933441	AC2-157 C	16.5832	50/50	16.5832
933442	AC2-157 E	27.0568	50/50	27.0568
941341	AE2-130 C	104.7312	50/50	104.7312
941342	AE2-130 E	69.8208	50/50	69.8208
942601	AE2-276	10.9100	50/50	10.9100
944201	AF1-088 FTIR	218.2000	50/50	218.2000
955131	J991	10.5080	PJM External (MISO)	10.5080
957141	AF2-008 FTIR	109.1000	50/50	109.1000
957142	AF2-008 NFTI	109.1000	50/50	109.1000
LGEE	LGEE	0.4033	Confirmed LTF	0.4033
CPL	CPL	0.1111	Confirmed LTF	0.1111
CBM-W2	CBM-W2	10.6552	Confirmed LTF	10.6552
NY	NY	0.1537	Confirmed LTF	0.1537
TVA	TVA	1.6506	Confirmed LTF	1.6506
O-066	O-066	1.7808	Confirmed LTF	1.7808
EDWARDS	EDWARDS	0.0462	Confirmed LTF	0.0462
CBM-S2	CBM-S2	1.7513	Confirmed LTF	1.7513
CBM-S1	CBM-S1	9.3038	Confirmed LTF	9.3038
TILTON	TILTON	4.7691	Confirmed LTF	4.7691
G-007	G-007	0.2746	Confirmed LTF	0.2746
MADISON	MADISON	1.7620	Confirmed LTF	1.7620
MEC	MEC	1.0948	Confirmed LTF	1.0948

10.7.10 Index 10

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
95169445	247712	05SULLIVAN	AEP	243216	05DARWIN	AEP	1	AEP_P4_#8648_05JEFRS O 765_B	breaker	1160.0	135.52	154.33	DC	218.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	50.1978	50/50	50.1978
243443	05RKG2	49.4372	50/50	49.4372
930461	AB1-087	120.0100	50/50	120.0100
930471	AB1-088	120.0100	50/50	120.0100
933441	AC2-157 C	16.5832	50/50	16.5832
933442	AC2-157 E	27.0568	50/50	27.0568
941341	AE2-130 C	104.7312	50/50	104.7312
941342	AE2-130 E	69.8208	50/50	69.8208
942601	AE2-276	10.9100	50/50	10.9100
944201	AF1-088 FTIR	218.2000	50/50	218.2000
955131	J991	10.5080	PJM External (MISO)	10.5080
957141	AF2-008 FTIR	109.1000	50/50	109.1000
957142	AF2-008 NFTI	109.1000	50/50	109.1000
LGEE	LGEE	0.4033	Confirmed LTF	0.4033
CPL	CPL	0.1111	Confirmed LTF	0.1111
CBM-W2	CBM-W2	10.6552	Confirmed LTF	10.6552
NY	NY	0.1537	Confirmed LTF	0.1537
TVA	TVA	1.6506	Confirmed LTF	1.6506
O-066	O-066	1.7808	Confirmed LTF	1.7808
EDWARDS	EDWARDS	0.0462	Confirmed LTF	0.0462
CBM-S2	CBM-S2	1.7513	Confirmed LTF	1.7513
CBM-S1	CBM-S1	9.3038	Confirmed LTF	9.3038
TILTON	TILTON	4.7691	Confirmed LTF	4.7691
G-007	G-007	0.2746	Confirmed LTF	0.2746
MADISON	MADISON	1.7620	Confirmed LTF	1.7620
MEC	MEC	1.0948	Confirmed LTF	1.0948

10.7.11 Index 11

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
95169498	247712	05SULLIVAN	AEP	254529	16PETE	IPL	1	AEP_P4_#8648_05JEFRS O 765_B	breaker	1409.0	104.35	122.47	DC	255.67

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	58.8022	50/50	58.8022
243443	05RKG2	57.9112	50/50	57.9112
247900	05FR-11G E	3.5687	Adder	4.2
247901	05FR-12G E	3.5094	Adder	4.13
247902	05FR-21G E	3.7510	Adder	4.41
247903	05FR-22G E	3.5915	Adder	4.23
247904	05FR-3G E	7.2741	Adder	8.56
247905	05FR-4G E	5.6971	Adder	6.7
274882	W4-005 E	11.0781	Adder	13.03
276153	W2-048 E	2.6966	Adder	3.17
909052	X2-022 E	8.1114	Adder	9.54
925771	AC1-053 C	1.1074	Adder	1.3
925772	AC1-053 E	7.4113	Adder	8.72
930461	AB1-087	140.6185	50/50	140.6185
930471	AB1-088	140.6185	50/50	140.6185
933441	AC2-157 C	19.4309	50/50	19.4309
933442	AC2-157 E	31.7031	50/50	31.7031
935141	AD1-148	2.1142	Adder	2.49
936771	AD2-100 C	6.1143	Adder	7.19
936772	AD2-100 E	4.0762	Adder	4.8
936971	AD2-131 C	0.4028	Adder	0.47
936972	AD2-131 E	2.0236	Adder	2.38
937211	AD2-159 C	1.4039	Adder	1.65
937212	AD2-159 E	6.5728	Adder	7.73
941341	AE2-130 C	122.6832	50/50	122.6832
941342	AE2-130 E	81.7888	50/50	81.7888
942481	AE2-261 C	8.5013	Adder	10.0
942482	AE2-261 E	5.6675	Adder	6.67
942601	AE2-276	12.7835	50/50	12.7835
944201	AF1-088 FTIR	255.6700	50/50	255.6700
944221	AF1-090 C O1	1.8254	Adder	2.15
944222	AF1-090 E O1	8.5463	Adder	10.05

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945391	AF1-204 C O1	3.4100	Adder	4.01
945392	AF1-204 E O1	10.2301	Adder	12.04
945871	AF1-252 O1	3.2360	Adder	3.81
945881	AF1-253 O1	2.2403	Adder	2.64
953401	J811	6.4667	PJM External (MISO)	6.4667
953651	J815	12.7650	PJM External (MISO)	12.7650
953881	J848 C	2.0518	PJM External (MISO)	2.0518
953882	J848 E	11.1007	PJM External (MISO)	11.1007
954411	J912	5.4970	PJM External (MISO)	5.4970
954681	J949 C	11.7742	PJM External (MISO)	11.7742
954761	J468 C	1.9313	PJM External (MISO)	1.9313
954762	J468 E	10.9442	PJM External (MISO)	10.9442
955031	J979 C	1.6414	PJM External (MISO)	1.6414
955032	J979 E	8.8806	PJM External (MISO)	8.8806
955131	J991	13.6300	PJM External (MISO)	13.6300
956451	J1139	8.4810	PJM External (MISO)	8.4810
957141	AF2-008 FTIR	127.8350	50/50	127.8350
957142	AF2-008 NFTI	127.8350	50/50	127.8350
957381	AF2-032 C	0.6387	Adder	0.75
957382	AF2-032 E	0.3006	Adder	0.35
960172	AF2-308 BAT	1.4644	Merchant Transmission	1.4644
960261	AF2-317	0.6765	Adder	0.8
961003	AF2-391 BAT	6.4932	Merchant Transmission	6.4932
WEC	WEC	0.8943	Confirmed LTF	0.8943
GIBSON	GIBSON	6.4559	Confirmed LTF	6.4559
NY	NY	0.4695	Confirmed LTF	0.4695

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
O-066	O-066	5.5440	Confirmed LTF	5.5440
CHEOAH	CHEOAH	0.4675	Confirmed LTF	0.4675
G-007	G-007	0.8580	Confirmed LTF	0.8580
MADISON	MADISON	12.5597	Confirmed LTF	12.5597
MEC	MEC	4.8401	Confirmed LTF	4.8401
CALDERWOOD	CALDERWOOD	0.4682	Confirmed LTF	0.4682
BLUEG	BLUEG	9.3310	Confirmed LTF	9.3310
TRIMBLE	TRIMBLE	2.8910	Confirmed LTF	2.8910
LGE-GI-0012019	LGE-GI-0012019	5.7145	LTF	5.7145
CATAWBA	CATAWBA	0.2814	Confirmed LTF	0.2814
CBM-W1	CBM-W1	24.9950	Confirmed LTF	24.9950

10.7.12 Index 12

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
98608233	248000	06CLIFT Y	OVEC	248001	06DEARB 1	OVEC	1	AEP_P4_#1760_05JEFRS O 765_A	breaker	1023.0	110.59	116.55	AC	61.04

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
930461	AB1-087	28.5362	Adder	33.57
930471	AB1-088	28.5362	Adder	33.57
933441	AC2-157 C	3.9432	Adder	4.64
933442	AC2-157 E	6.4336	Adder	7.57
941341	AE2-130 C	48.0053	Adder	56.48
941342	AE2-130 E	32.0035	Adder	37.65
942601	AE2-276	2.5942	Adder	3.05
944201	AF1-088 FTIR	61.0400	Merchant Transmission	61.0400
957141	AF2-008 FTIR	30.5200	Merchant Transmission	30.5200
957142	AF2-008 NFTI	30.5200	Merchant Transmission	30.5200
957961	AF2-090 C	3.6767	Adder	4.33
957962	AF2-090 E	1.8183	Adder	2.14
959691	AF2-260 C	2.4363	Adder	2.87
959692	AF2-260 E	1.4710	Adder	1.73
960171	AF2-308	1.3042	Adder	1.53
960181	AF2-309 C	1.9564	Adder	2.3
960182	AF2-309 E	1.3042	Adder	1.53
961001	AF2-391 C O1	3.4921	Adder	4.11
961002	AF2-391 E O1	2.3280	Adder	2.74
WEC	WEC	0.3383	Confirmed LTF	0.3383
LGEE	LGEE	4.6747	Confirmed LTF	4.6747
CPL	CPL	0.3949	Confirmed LTF	0.3949
CBM-W2	CBM-W2	19.5659	Confirmed LTF	19.5659
NY	NY	0.0785	Confirmed LTF	0.0785
TVA	TVA	3.0856	Confirmed LTF	3.0856
O-066	O-066	1.5926	Confirmed LTF	1.5926
CBM-S2	CBM-S2	4.8668	Confirmed LTF	4.8668
CBM-S1	CBM-S1	28.2438	Confirmed LTF	28.2438
G-007	G-007	0.2444	Confirmed LTF	0.2444

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
MADISON	MADISON	14.1221	Confirmed LTF	14.1221
MEC	MEC	2.7426	Confirmed LTF	2.7426
CBM-W1	CBM-W1	13.4483	Confirmed LTF	13.4483

10.7.13 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
96032200	270704	LORETTO ; B	CE	939400	AE1-172 TAP	CE	1	COMED_P1-2_345-L8014____S-B	single	1528.0	128.3	130.31	AC	28.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274650	KINCAID ;1U	19.8153	80/20	19.8153
274651	KINCAID ;2U	19.8085	80/20	19.8085
274853	TWINGROVE;U1	2.6262	80/20	2.6262
274854	TWINGROVE;U2	2.6262	80/20	2.6262
274863	CAYUGA RI;1U	3.1359	80/20	3.1359
274864	CAYUGA RI;2U	3.1359	80/20	3.1359
274880	GENERATOR;	2.3996	80/20	2.3996
917501	Z2-087 C	2.2081	80/20	2.2081
924041	AB2-047 C O1	15.8360	80/20	15.8360
924261	AB2-070 C O1	7.4979	80/20	7.4979
925771	AC1-053 C	7.3598	80/20	7.3598
926841	AC1-171 C O1	0.6170	80/20	0.6170
930461	AB1-087	31.8395	80/20	31.8395
930471	AB1-088	31.8395	80/20	31.8395
933441	AC2-157 C	4.3996	80/20	4.3996
935001	AD1-133 C O1	87.9372	80/20	87.9372
935141	AD1-148	13.3177	80/20	13.3177
936771	AD2-100 C	24.6254	80/20	24.6254
936971	AD2-131 C	1.6222	80/20	1.6222
937211	AD2-159 C	9.9634	80/20	9.9634
939741	AE1-205 C O1	40.9298	80/20	40.9298
941731	AE2-173 O1	24.3630	80/20	24.3630
942111	AE2-223 C	9.5016	80/20	9.5016
942481	AE2-261 C	36.2460	80/20	36.2460
942601	AE2-276	2.8945	80/20	2.8945
944201	AF1-088 FTIR	57.8900	80/20	57.8900
944221	AF1-090 C O1	6.1987	80/20	6.1987
945391	AF1-204 C O1	4.3790	80/20	4.3790
945871	AF1-252 O1	10.9886	80/20	10.9886
945881	AF1-253 O1	7.6075	80/20	7.6075

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
951741	J474 C	5.2683	PJM External (MISO)	5.2683
952251	J641	13.6612	PJM External (MISO)	13.6612
952271	J644	13.7192	PJM External (MISO)	13.7192
952651	J756 C	4.5616	PJM External (MISO)	4.5616
952871	J757 C	5.8619	PJM External (MISO)	5.8619
953401	J811	10.7702	PJM External (MISO)	10.7702
953651	J815	37.7150	PJM External (MISO)	37.7150
953741	J826 C	3.1177	PJM External (MISO)	3.1177
953851	J845 C	3.0298	PJM External (MISO)	3.0298
953881	J848 C	5.7806	PJM External (MISO)	5.7806
954411	J912	14.2520	PJM External (MISO)	14.2520
954721	J750 C	3.7023	PJM External (MISO)	3.7023
954761	J468 C	3.0285	PJM External (MISO)	3.0285
954821	J955	179.4416	PJM External (MISO)	179.4416
955031	J979 C	4.6245	PJM External (MISO)	4.6245
955401	J1022 C	4.6765	PJM External (MISO)	4.6765
955711	J1055 C	2.1869	PJM External (MISO)	2.1869
956151	J1102	11.4667	PJM External (MISO)	11.4667
956281	J1115 C	7.7498	PJM External (MISO)	7.7498
956451	J1139	17.6880	PJM External (MISO)	17.6880

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957141	AF2-008 FTIR	28.9450	80/20	28.9450
957381	AF2-032 C	2.7809	80/20	2.7809
959341	AF2-225 C	30.6974	80/20	30.6974
959611	AF2-252 C	7.6100	80/20	7.6100
960141	AF2-305	2.6531	80/20	2.6531
960261	AF2-317	4.2617	80/20	4.2617
960611	AF2-352 C	7.6100	80/20	7.6100
LGEE	LGEE	1.5278	Confirmed LTF	1.5278
CPLE	CPLE	1.2271	Confirmed LTF	1.2271
G-007A	G-007A	2.0379	Confirmed LTF	2.0379
VFT	VFT	5.4696	Confirmed LTF	5.4696
CBM-W2	CBM-W2	47.2399	Confirmed LTF	47.2399
TVA	TVA	5.3886	Confirmed LTF	5.3886
CBM-S2	CBM-S2	12.3576	Confirmed LTF	12.3576
CBM-S1	CBM-S1	30.9446	Confirmed LTF	30.9446
MADISON	MADISON	2.5260	Confirmed LTF	2.5260
MEC	MEC	3.4307	Confirmed LTF	3.4307

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
96032218	270852	PONTIAC ; B	CE	270704	LORETTO ; B	CE	1	COMED_P1-2_345-18014__-S-B	single	1528.0	124.74	126.76	AC	29.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274650	KINCAID ;1U	19.8454	80/20	19.8454
274651	KINCAID ;2U	19.8386	80/20	19.8386
274853	TWINGROVE;U1	2.6283	80/20	2.6283
274854	TWINGROVE;U2	2.6283	80/20	2.6283
274880	GENERATOR;	2.4020	80/20	2.4020
917501	Z2-087 C	2.2095	80/20	2.2095
924041	AB2-047 C O1	15.8460	80/20	15.8460
924261	AB2-070 C O1	7.5059	80/20	7.5059
925771	AC1-053 C	7.3679	80/20	7.3679
926841	AC1-171 C O1	0.6202	80/20	0.6202
930461	AB1-087	32.0100	80/20	32.0100
930471	AB1-088	32.0100	80/20	32.0100
933441	AC2-157 C	4.4232	80/20	4.4232
935001	AD1-133 C O1	87.9930	80/20	87.9930
935141	AD1-148	13.3329	80/20	13.3329
936771	AD2-100 C	24.6645	80/20	24.6645
936971	AD2-131 C	1.6247	80/20	1.6247
937211	AD2-159 C	9.9736	80/20	9.9736
939741	AE1-205 C O1	40.9559	80/20	40.9559
941731	AE2-173 O1	24.3785	80/20	24.3785
942111	AE2-223 C	9.5076	80/20	9.5076
942481	AE2-261 C	36.3016	80/20	36.3016
942601	AE2-276	2.9100	80/20	2.9100
944201	AF1-088 FTIR	58.2000	80/20	58.2000
944221	AF1-090 C O1	6.2096	80/20	6.2096
945391	AF1-204 C O1	4.3987	80/20	4.3987
945871	AF1-252 O1	11.0080	80/20	11.0080
945881	AF1-253 O1	7.6209	80/20	7.6209
951741	J474 C	5.2683	PJM External (MISO)	5.2683

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952251	J641	13.6612	PJM External (MISO)	13.6612
952271	J644	13.7192	PJM External (MISO)	13.7192
952651	J756 C	4.5616	PJM External (MISO)	4.5616
952871	J757 C	5.8619	PJM External (MISO)	5.8619
953401	J811	10.7702	PJM External (MISO)	10.7702
953651	J815	37.7150	PJM External (MISO)	37.7150
953741	J826 C	3.1177	PJM External (MISO)	3.1177
953851	J845 C	3.0298	PJM External (MISO)	3.0298
953881	J848 C	5.7806	PJM External (MISO)	5.7806
954411	J912	14.2520	PJM External (MISO)	14.2520
954721	J750 C	3.7023	PJM External (MISO)	3.7023
954761	J468 C	3.0285	PJM External (MISO)	3.0285
954821	J955	179.4416	PJM External (MISO)	179.4416
955031	J979 C	4.6245	PJM External (MISO)	4.6245
955401	J1022 C	4.6765	PJM External (MISO)	4.6765
955711	J1055 C	2.1869	PJM External (MISO)	2.1869
956151	J1102	11.4667	PJM External (MISO)	11.4667
956281	J1115 C	7.7498	PJM External (MISO)	7.7498
956451	J1139	17.6880	PJM External (MISO)	17.6880
957141	AF2-008 FTIR	29.1000	80/20	29.1000
957381	AF2-032 C	2.7851	80/20	2.7851

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959341	AF2-225 C	30.7169	80/20	30.7169
959611	AF2-252 C	7.6162	80/20	7.6162
960141	AF2-305	2.6559	80/20	2.6559
960261	AF2-317	4.2665	80/20	4.2665
960611	AF2-352 C	7.6162	80/20	7.6162
LGEE	LGEE	1.5455	Confirmed LTF	1.5455
CPL	CPL	1.2476	Confirmed LTF	1.2476
G-007A	G-007A	2.1122	Confirmed LTF	2.1122
VFT	VFT	5.6696	Confirmed LTF	5.6696
CBM-W2	CBM-W2	47.4938	Confirmed LTF	47.4938
TVA	TVA	5.4320	Confirmed LTF	5.4320
CBM-S2	CBM-S2	12.5368	Confirmed LTF	12.5368
CBM-S1	CBM-S1	31.2088	Confirmed LTF	31.2088
MADISON	MADISON	2.5260	Confirmed LTF	2.5260
MEC	MEC	3.4799	Confirmed LTF	3.4799

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
96032228	270853	PONTIAC ; R	CE	935000	AD1-133 TAP	CE	1	COMED_P1-2_345-L11212_B-S-B	single	1528.0	115.5	117.37	AC	26.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274650	KINCAID ;1U	17.7318	80/20	17.7318
274651	KINCAID ;2U	17.7251	80/20	17.7251
274853	TWINGROVE;U1	2.3999	80/20	2.3999
274854	TWINGROVE;U2	2.3999	80/20	2.3999
274863	CAYUGA RI;1U	2.3503	80/20	2.3503
274864	CAYUGA RI;2U	2.3503	80/20	2.3503
274880	GENERATOR;	2.1812	80/20	2.1812
917501	Z2-087 C	2.0351	80/20	2.0351
924041	AB2-047 C O1	14.5954	80/20	14.5954
924261	AB2-070 C O1	6.8143	80/20	6.8143
925771	AC1-053 C	6.6838	80/20	6.6838
930461	AB1-087	29.4580	80/20	29.4580
930471	AB1-088	29.4580	80/20	29.4580
933441	AC2-157 C	4.0706	80/20	4.0706
935141	AD1-148	12.0731	80/20	12.0731
936771	AD2-100 C	22.0298	80/20	22.0298
936971	AD2-131 C	1.4512	80/20	1.4512
937211	AD2-159 C	9.0569	80/20	9.0569
939401	AE1-172 C O1	20.1380	80/20	20.1380
939741	AE1-205 C O1	37.7236	80/20	37.7236
940101	AE1-252 C O1	40.4559	80/20	40.4559
941731	AE2-173 O1	22.4545	80/20	22.4545
942111	AE2-223 C	8.7573	80/20	8.7573
942481	AE2-261 C	32.4337	80/20	32.4337
942601	AE2-276	2.6780	80/20	2.6780
944201	AF1-088 FTIR	53.5600	80/20	53.5600
944221	AF1-090 C O1	5.5412	80/20	5.5412
945391	AF1-204 C O1	4.0622	80/20	4.0622
945871	AF1-252 O1	9.8230	80/20	9.8230
945881	AF1-253 O1	6.8005	80/20	6.8005

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
951741	J474 C	4.8938	PJM External (MISO)	4.8938
952271	J644	12.3211	PJM External (MISO)	12.3211
952651	J756 C	4.0709	PJM External (MISO)	4.0709
952871	J757 C	5.2529	PJM External (MISO)	5.2529
953401	J811	10.1752	PJM External (MISO)	10.1752
953651	J815	34.9975	PJM External (MISO)	34.9975
953741	J826 C	2.9269	PJM External (MISO)	2.9269
953851	J845 C	2.8731	PJM External (MISO)	2.8731
953881	J848 C	5.3855	PJM External (MISO)	5.3855
954411	J912	13.3020	PJM External (MISO)	13.3020
954721	J750 C	3.3691	PJM External (MISO)	3.3691
954761	J468 C	2.9370	PJM External (MISO)	2.9370
954821	J955	165.6512	PJM External (MISO)	165.6512
955031	J979 C	4.3084	PJM External (MISO)	4.3084
955401	J1022 C	4.3903	PJM External (MISO)	4.3903
956151	J1102	10.3614	PJM External (MISO)	10.3614
956281	J1115 C	7.2184	PJM External (MISO)	7.2184
956451	J1139	17.0220	PJM External (MISO)	17.0220
957141	AF2-008 FTIR	26.7800	80/20	26.7800
957381	AF2-032 C	2.4885	80/20	2.4885
959341	AF2-225 C	28.2927	80/20	28.2927
959611	AF2-252 C	6.9544	80/20	6.9544

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960141	AF2-305	2.4112	80/20	2.4112
960261	AF2-317	3.8634	80/20	3.8634
960611	AF2-352 C	6.9544	80/20	6.9544
LGEE	LGEE	1.4685	Confirmed LTF	1.4685
CPLE	CPLE	1.1801	Confirmed LTF	1.1801
G-007A	G-007A	2.3208	Confirmed LTF	2.3208
VFT	VFT	6.2371	Confirmed LTF	6.2371
CBM-W2	CBM-W2	40.8845	Confirmed LTF	40.8845
TVA	TVA	4.7460	Confirmed LTF	4.7460
CBM-S2	CBM-S2	11.6236	Confirmed LTF	11.6236
CBM-S1	CBM-S1	27.5878	Confirmed LTF	27.5878
MEC	MEC	1.1393	Confirmed LTF	1.1393

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/DC	MW IMPACT
98608456	324010	7TRIMBL REAC	LGEE	248000	06CLIFTY	OVEC	1	AEP_P1-2_#363	single	1451.0	122.93	125.13	DC	31.93

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	14.6758	80/20	14.6758
243443	05RKG2	14.4534	80/20	14.4534
342900	1COOPER1 G	2.4476	80/20	2.4476
342903	1COOPER2 G	4.7463	80/20	4.7463
342918	1JKCT 1G	1.9109	80/20	1.9109
342921	1JKCT 2G	1.3926	80/20	1.3926
342924	1JKCT 3G	1.9109	80/20	1.9109
342927	1JKCT 4G	1.2681	80/20	1.2681
342930	1JKCT 5G	1.2612	80/20	1.2612
342933	1JKCT 6G	1.2681	80/20	1.2681
342936	1JKCT 7G	1.2681	80/20	1.2681
342939	1JKCT 9G	1.3039	80/20	1.3039
342942	1JKCT 10G	1.3039	80/20	1.3039
342945	1LAUREL 1G	1.3811	80/20	1.3811
925981	AC1-074 C O1 (Suspended)	3.9900	80/20	3.9900
930461	AB1-087	35.1175	80/20	35.1175
930471	AB1-088	35.1175	80/20	35.1175
932551	AC2-075 C (Suspended)	0.9476	80/20	0.9476
933441	AC2-157 C	4.8526	80/20	4.8526
936381	AD2-048 C	3.4339	80/20	3.4339
936571	AD2-072 C O1 (Suspended)	10.1227	80/20	10.1227
939131	AE1-143 C	9.5786	80/20	9.5786
940041	AE1-246 C O1	11.9581	80/20	11.9581
940831	AE2-071 C	3.0330	80/20	3.0330
941341	AE2-130 C	30.6192	80/20	30.6192
941411	AE2-138 C	15.1574	80/20	15.1574
941981	AE2-210 C O1	5.2228	80/20	5.2228
942411	AE2-254 C O1	4.0302	80/20	4.0302
942591	AE2-275 C O1	6.8186	80/20	6.8186
942601	AE2-276	3.1925	80/20	3.1925
942891	AE2-308 C O1	11.5159	80/20	11.5159

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943111	AE2-339 C	2.5645	80/20	2.5645
943701	AF1-038 C	4.6616	80/20	4.6616
943821	AF1-050 C	5.4155	80/20	5.4155
944151	AF1-083 C O1	4.9817	80/20	4.9817
944201	AF1-088 FTIR	63.8500	80/20	63.8500
944511	AF1-116 C	10.7424	80/20	10.7424
944621	AF1-127 C O1	4.4365	80/20	4.4365
945381	AF1-203 C	1.7332	80/20	1.7332
945861	AF1-251 C	10.7250	80/20	10.7250
952811	J759	9.7041	PJM External (MISO)	9.7041
952821	J762	29.9340	PJM External (MISO)	29.9340
952861	J783 C	9.2998	PJM External (MISO)	9.2998
953611	J800	14.0125	PJM External (MISO)	14.0125
953931	J856	9.4096	PJM External (MISO)	9.4096
955451	J1027	13.7235	PJM External (MISO)	13.7235
955461	J1028	15.2070	PJM External (MISO)	15.2070
955891	J1074	22.9880	PJM External (MISO)	22.9880
956911	J1189	0.4454	PJM External (MISO)	0.4454
957141	AF2-008 FTIR	31.9250	80/20	31.9250
957961	AF2-090 C	16.4651	80/20	16.4651
959691	AF2-260 C	10.8486	80/20	10.8486
960151	AF2-306	1.6770	80/20	1.6770
960161	AF2-307 C	2.5542	80/20	2.5542
960171	AF2-308	5.8142	80/20	5.8142
960181	AF2-309 C	8.7213	80/20	8.7213
960641	AF2-355 C O1	15.1321	80/20	15.1321
960741	AF2-365 C O1	4.7391	80/20	4.7391
961001	AF2-391 C O1	15.6154	80/20	15.6154
WEC	WEC	0.6659	Confirmed LTF	0.6659
LGEE	LGEE	18.1448	Confirmed LTF	18.1448

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CPLE	CPLE	1.2039	Confirmed LTF	1.2039
CBM-W2	CBM-W2	56.2571	Confirmed LTF	56.2571
NY	NY	0.2704	Confirmed LTF	0.2704
TVA	TVA	9.5242	Confirmed LTF	9.5242
CBM-S2	CBM-S2	14.8026	Confirmed LTF	14.8026
CBM-S1	CBM-S1	97.4773	Confirmed LTF	97.4773
MADISON	MADISON	12.3359	Confirmed LTF	12.3359
MEC	MEC	6.1033	Confirmed LTF	6.1033
CBM-W1	CBM-W1	20.4163	Confirmed LTF	20.4163

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/DC	MW IMPACT
96032272	917500	Z2-087 TAP	CE	270853	PONTIAC ; R	CE	1	COMED_P1-2_345-L8002____-S	single	1793.0	104.42	106.09	AC	29.18

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274650	KINCAID ;1U	18.4005	80/20	18.4005
274651	KINCAID ;2U	18.3714	80/20	18.3714
274853	TWINGROVE;U1	1.5235	80/20	1.5235
274854	TWINGROVE;U2	1.5235	80/20	1.5235
274880	GENERATOR;	1.7545	80/20	1.7545
917501	Z2-087 C	3.1039	80/20	3.1039
924041	AB2-047 C O1	22.2605	80/20	22.2605
924261	AB2-070 C O1	8.7976	80/20	8.7976
925771	AC1-053 C	8.5524	80/20	8.5524
926841	AC1-171 C O1	0.5824	80/20	0.5824
930461	AB1-087	32.0925	80/20	32.0925
930471	AB1-088	32.0925	80/20	32.0925
933441	AC2-157 C	4.4346	80/20	4.4346
935141	AD1-148	15.1356	80/20	15.1356
936771	AD2-100 C	22.9207	80/20	22.9207
936971	AD2-131 C	1.5099	80/20	1.5099
937211	AD2-159 C	7.2851	80/20	7.2851
939741	AE1-205 C O1	57.5350	80/20	57.5350
941731	AE2-173 O1	34.2470	80/20	34.2470
942111	AE2-223 C	13.3563	80/20	13.3563
942481	AE2-261 C	33.6788	80/20	33.6788
942601	AE2-276	2.9175	80/20	2.9175
944201	AF1-088 FTIR	58.3500	80/20	58.3500
944221	AF1-090 C O1	5.8024	80/20	5.8024
945391	AF1-204 C O1	4.5263	80/20	4.5263
945871	AF1-252 O1	10.2860	80/20	10.2860
945881	AF1-253 O1	7.1211	80/20	7.1211
951741	J474 C	5.8422	PJM External (MISO)	5.8422
952271	J644	12.7809	PJM External (MISO)	12.7809

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952651	J756 C	4.1056	PJM External (MISO)	4.1056
952871	J757 C	5.4267	PJM External (MISO)	5.4267
953401	J811	10.4445	PJM External (MISO)	10.4445
953651	J815	35.7975	PJM External (MISO)	35.7975
953741	J826 C	3.6492	PJM External (MISO)	3.6492
953851	J845 C	3.5592	PJM External (MISO)	3.5592
953881	J848 C	5.5009	PJM External (MISO)	5.5009
954411	J912	13.6120	PJM External (MISO)	13.6120
954721	J750 C	3.5381	PJM External (MISO)	3.5381
954761	J468 C	3.1703	PJM External (MISO)	3.1703
954821	J955	168.2200	PJM External (MISO)	168.2200
955031	J979 C	4.4008	PJM External (MISO)	4.4008
955401	J1022 C	5.4737	PJM External (MISO)	5.4737
956151	J1102	10.3075	PJM External (MISO)	10.3075
956281	J1115 C	6.9018	PJM External (MISO)	6.9018
956451	J1139	18.9525	PJM External (MISO)	18.9525
957141	AF2-008 FTIR	29.1750	80/20	29.1750
957381	AF2-032 C	2.5824	80/20	2.5824
959341	AF2-225 C	43.1512	80/20	43.1512
959611	AF2-252 C	4.4146	80/20	4.4146
960141	AF2-305	3.1130	80/20	3.1130
960261	AF2-317	4.8434	80/20	4.8434
960611	AF2-352 C	4.4146	80/20	4.4146
LGEE	LGEE	1.5769	Confirmed LTF	1.5769

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CPL	CPL	1.2555	Confirmed LTF	1.2555
G-007A	G-007A	2.3376	Confirmed LTF	2.3376
VFT	VFT	6.2823	Confirmed LTF	6.2823
CBM-W2	CBM-W2	45.6265	Confirmed LTF	45.6265
TVA	TVA	5.1954	Confirmed LTF	5.1954
CBM-S2	CBM-S2	12.4559	Confirmed LTF	12.4559
CBM-S1	CBM-S1	30.1182	Confirmed LTF	30.1182
MADISON	MADISON	1.0665	Confirmed LTF	1.0665
MEC	MEC	2.2802	Confirmed LTF	2.2802

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
96032210	935000	AD1-133 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P1-2_345-L11212_B-S-B	single	1528.0	122.89	124.77	AC	26.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274650	KINCAID ;1U	17.7318	80/20	17.7318
274651	KINCAID ;2U	17.7251	80/20	17.7251
274853	TWINGROVE;U1	2.3999	80/20	2.3999
274854	TWINGROVE;U2	2.3999	80/20	2.3999
274863	CAYUGA RI;1U	2.3503	80/20	2.3503
274864	CAYUGA RI;2U	2.3503	80/20	2.3503
274880	GENERATOR;	2.1812	80/20	2.1812
917501	Z2-087 C	2.0351	80/20	2.0351
924041	AB2-047 C O1	14.5954	80/20	14.5954
924261	AB2-070 C O1	6.8143	80/20	6.8143
925771	AC1-053 C	6.6838	80/20	6.6838
930461	AB1-087	29.4580	80/20	29.4580
930471	AB1-088	29.4580	80/20	29.4580
933441	AC2-157 C	4.0706	80/20	4.0706
935001	AD1-133 C O1	118.7676	80/20	118.7676
935141	AD1-148	12.0731	80/20	12.0731
936771	AD2-100 C	22.0298	80/20	22.0298
936971	AD2-131 C	1.4512	80/20	1.4512
937211	AD2-159 C	9.0569	80/20	9.0569
939401	AE1-172 C O1	20.1380	80/20	20.1380
939741	AE1-205 C O1	37.7236	80/20	37.7236
940101	AE1-252 C O1	40.4559	80/20	40.4559
941731	AE2-173 O1	22.4545	80/20	22.4545
942111	AE2-223 C	8.7573	80/20	8.7573
942481	AE2-261 C	32.4337	80/20	32.4337
942601	AE2-276	2.6780	80/20	2.6780
944201	AF1-088 FTIR	53.5600	80/20	53.5600
944221	AF1-090 C O1	5.5412	80/20	5.5412
945391	AF1-204 C O1	4.0622	80/20	4.0622
945871	AF1-252 O1	9.8230	80/20	9.8230
945881	AF1-253 O1	6.8005	80/20	6.8005

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
951741	J474 C	4.8938	PJM External (MISO)	4.8938
952271	J644	12.3211	PJM External (MISO)	12.3211
952651	J756 C	4.0709	PJM External (MISO)	4.0709
952871	J757 C	5.2529	PJM External (MISO)	5.2529
953401	J811	10.1752	PJM External (MISO)	10.1752
953651	J815	34.9975	PJM External (MISO)	34.9975
953741	J826 C	2.9269	PJM External (MISO)	2.9269
953851	J845 C	2.8731	PJM External (MISO)	2.8731
953881	J848 C	5.3855	PJM External (MISO)	5.3855
954411	J912	13.3020	PJM External (MISO)	13.3020
954721	J750 C	3.3691	PJM External (MISO)	3.3691
954761	J468 C	2.9370	PJM External (MISO)	2.9370
954821	J955	165.6512	PJM External (MISO)	165.6512
955031	J979 C	4.3084	PJM External (MISO)	4.3084
955401	J1022 C	4.3903	PJM External (MISO)	4.3903
956151	J1102	10.3614	PJM External (MISO)	10.3614
956281	J1115 C	7.2184	PJM External (MISO)	7.2184
956451	J1139	17.0220	PJM External (MISO)	17.0220
957141	AF2-008 FTIR	26.7800	80/20	26.7800
957381	AF2-032 C	2.4885	80/20	2.4885
959341	AF2-225 C	28.2927	80/20	28.2927
959611	AF2-252 C	6.9544	80/20	6.9544

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960141	AF2-305	2.4112	80/20	2.4112
960261	AF2-317	3.8634	80/20	3.8634
960611	AF2-352 C	6.9544	80/20	6.9544
LGEE	LGEE	1.4685	Confirmed LTF	1.4685
CPL	CPL	1.1801	Confirmed LTF	1.1801
G-007A	G-007A	2.3208	Confirmed LTF	2.3208
VFT	VFT	6.2371	Confirmed LTF	6.2371
CBM-W2	CBM-W2	40.8845	Confirmed LTF	40.8845
TVA	TVA	4.7460	Confirmed LTF	4.7460
CBM-S2	CBM-S2	11.6236	Confirmed LTF	11.6236
CBM-S1	CBM-S1	27.5878	Confirmed LTF	27.5878
MEC	MEC	1.1393	Confirmed LTF	1.1393

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
96032186	939400	AE1-172 TAP	CE	934720	AD1-100 TAP	CE	1	COMED_P1-2_345-L8014__S-B	single	1528.0	132.56	134.58	AC	28.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274650	KINCAID ;1U	19.8153	80/20	19.8153
274651	KINCAID ;2U	19.8085	80/20	19.8085
274853	TWINGROVE;U1	2.6262	80/20	2.6262
274854	TWINGROVE;U2	2.6262	80/20	2.6262
274863	CAYUGA RI;1U	3.1359	80/20	3.1359
274864	CAYUGA RI;2U	3.1359	80/20	3.1359
274880	GENERATOR;	2.3996	80/20	2.3996
917501	Z2-087 C	2.2081	80/20	2.2081
924041	AB2-047 C O1	15.8360	80/20	15.8360
924261	AB2-070 C O1	7.4979	80/20	7.4979
925771	AC1-053 C	7.3598	80/20	7.3598
926841	AC1-171 C O1	0.6170	80/20	0.6170
930461	AB1-087	31.8395	80/20	31.8395
930471	AB1-088	31.8395	80/20	31.8395
933441	AC2-157 C	4.3996	80/20	4.3996
935001	AD1-133 C O1	87.9372	80/20	87.9372
935141	AD1-148	13.3177	80/20	13.3177
936771	AD2-100 C	24.6254	80/20	24.6254
936971	AD2-131 C	1.6222	80/20	1.6222
937211	AD2-159 C	9.9634	80/20	9.9634
939401	AE1-172 C O1	29.6670	80/20	29.6670
939741	AE1-205 C O1	40.9298	80/20	40.9298
940101	AE1-252 C O1	59.5989	80/20	59.5989
941731	AE2-173 O1	24.3630	80/20	24.3630
942111	AE2-223 C	9.5016	80/20	9.5016
942481	AE2-261 C	36.2460	80/20	36.2460
942601	AE2-276	2.8945	80/20	2.8945
944201	AF1-088 FTIR	57.8900	80/20	57.8900
944221	AF1-090 C O1	6.1987	80/20	6.1987
945391	AF1-204 C O1	4.3790	80/20	4.3790
945871	AF1-252 O1	10.9886	80/20	10.9886

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945881	AF1-253 O1	7.6075	80/20	7.6075
951741	J474 C	5.2683	PJM External (MISO)	5.2683
952271	J644	13.7192	PJM External (MISO)	13.7192
952651	J756 C	4.5616	PJM External (MISO)	4.5616
952871	J757 C	5.8619	PJM External (MISO)	5.8619
953401	J811	10.7702	PJM External (MISO)	10.7702
953651	J815	37.7150	PJM External (MISO)	37.7150
953741	J826 C	3.1177	PJM External (MISO)	3.1177
953851	J845 C	3.0298	PJM External (MISO)	3.0298
953881	J848 C	5.7806	PJM External (MISO)	5.7806
954411	J912	14.2520	PJM External (MISO)	14.2520
954721	J750 C	3.7023	PJM External (MISO)	3.7023
954821	J955	179.4416	PJM External (MISO)	179.4416
955031	J979 C	4.6245	PJM External (MISO)	4.6245
955401	J1022 C	4.6765	PJM External (MISO)	4.6765
956151	J1102	11.4667	PJM External (MISO)	11.4667
956281	J1115 C	7.7498	PJM External (MISO)	7.7498
956451	J1139	17.6880	PJM External (MISO)	17.6880
957141	AF2-008 FTIR	28.9450	80/20	28.9450
957381	AF2-032 C	2.7809	80/20	2.7809
959341	AF2-225 C	30.6974	80/20	30.6974
959611	AF2-252 C	7.6100	80/20	7.6100
960141	AF2-305	2.6531	80/20	2.6531

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960261	AF2-317	4.2617	80/20	4.2617
960611	AF2-352 C	7.6100	80/20	7.6100
LGEE	LGEE	1.5278	Confirmed LTF	1.5278
CPL	CPL	1.2271	Confirmed LTF	1.2271
G-007A	G-007A	2.0379	Confirmed LTF	2.0379
VFT	VFT	5.4696	Confirmed LTF	5.4696
CBM-W2	CBM-W2	47.2399	Confirmed LTF	47.2399
TVA	TVA	5.3886	Confirmed LTF	5.3886
CBM-S2	CBM-S2	12.3576	Confirmed LTF	12.3576
CBM-S1	CBM-S1	30.9446	Confirmed LTF	30.9446
MADISON	MADISON	2.5260	Confirmed LTF	2.5260
MEC	MEC	3.4307	Confirmed LTF	3.4307

10.8 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
AB1-006	Meadow Lake 345kV	In Service
AB1-087	Sullivan 345kV #1	Active
AB1-088	Sullivan 345kV #2	Active
AB2-047	Brokaw-Pontiac Midpoint	In Service
AB2-070	Mt. Pulaski-Brokaw	Under Construction
AC1-053	Lanesville-Brokaw	Active
AC1-056	PJM-AMIL	Confirmed
AC1-074	Jacksonville-Renaker 138kV I	Suspended
AC1-171	Powerton	Active
AC2-075	Jacksonville-Renaker 138 kV	Suspended
AC2-117	University Park North	Engineering and Procurement
AC2-157	Sullivan 345 kV	Active
AD1-043	Makahoy 138 kV	Active
AD1-133	Pontiac MidPoint-Dresden	Active
AD1-148	Brokaw-Lanesville	Active
AD2-048	Cynthia-Headquarters 69 kV	Engineering and Procurement
AD2-072	Van Arsdell-Mercer Industrial 69kV	Suspended
AD2-100	Kincaid-Pana 345 kV	Active
AD2-131	Kincaid-Pana 345kV	Active
AD2-159	Chestnut 345kV	Active
AE1-143	Marion County 161 kV	Engineering and Procurement
AE1-172	Loretto-Wilton Center	Active
AE1-205	McLean 345 kV	Active
AE1-246	Barren County-Summer Shade 161 kV	Active
AE1-252	Loretto-Wilton Center	Active
AE2-071	Patton Rd-Summer Shade 69 kV	Active
AE2-130	Rockport 765 kV	Active
AE2-138	Avon-North Clark 345 kV	Active
AE2-154	Meadow Lake 345 kV (MLV VIII)	Active

Queue Number	Project Name	Status
AE2-169	Delaware-Van Buren 138 kV	Active
AE2-172	Mississinewa-Gaston 138 kV	Active
AE2-173	McLean 345 kV	Active
AE2-210	Avon-North Clark 345 kV	Active
AE2-223	McLean 345 kV	Active
AE2-254	Garrard County-Tommy-Gooch 69 kV	Engineering and Procurement
AE2-261	Kincaid-Pana	Active
AE2-275	JK Smith-Fawkes 138 kV	Active
AE2-276	Sullivan 345kV	Active
AE2-297	Madison-Tanners Creek 138 kV	Engineering and Procurement
AE2-308	Three Forks-Dale 138 kV	Active
AE2-339	Avon 138 kV	Active
AF1-038	Sewellton Jct-Webbs Crossroads 69 kV	Active
AF1-050	Summer Shade - Green County 161 kV	Active
AF1-083	Green County-Saloma 161 kV	Active
AF1-088	Sullivan 345 kV	Active
AF1-090	Kincaid-Pana	Active
AF1-116	Marion County 161 kV	Active
AF1-127	Avon 345 kV	Active
AF1-203	Patton Rd-Summer Shade 69 kV	Active
AF1-204	Eugene 345 kV	Active
AF1-207	Reynolds-Olive #1 345 kV	Active
AF1-251	Avon-North Clark 345 kV	Active
AF1-252	Kincaid-Pana	Active
AF1-253	Kincaid-Pana	Active
AF1-322	Meadow Lake 345 kV	Active
AF2-008	Sullivan 345 kV	Active
AF2-032	Kincaid	Active
AF2-078	Reynolds-Olive #1 345 kV	Active
AF2-090	Central Hardin 138 kV	Active
AF2-188	Reynolds-Meadow Lake #1 345 kV	Active
AF2-225	McLean 345 kV	Active
AF2-252	Blue Mound 345 kV	Active
AF2-260	Stephensburg-Central Hardin 69 kV	Active
AF2-305	Brokaw-Lanesville 345 kV	Active
AF2-306	Hope-Blevins Valley Tap 69 kV	Active

Queue Number	Project Name	Status
AF2-307	Hope-Blevins Valley Tap 69 kV	Active
AF2-308	Central Hardin-Stephensburg 69 kV	Active
AF2-309	Central Hardin-Stephensburg 69 kV	Active
AF2-317	Hill Topper 345 kV	Active
AF2-352	Blue Mound 345 kV	Active
AF2-355	West Gerrard-J.K. Smith 345 nkV	Active
AF2-365	Munfordville KU Tap-Horse Cave Jct. 69 kV	Active
AF2-391	Central Hardin 69 kV	Active
AF2-407	Fall Creek 345 kV	Active
AF2-408	Fall Creek 138 kV	Active
W2-048	Brokaw-Lanesville	In Service
W4-005	Blue Mound-Latham	In Service
X2-022	Brokaw-Lanesville	In Service
Y1-054	Rochelle 138kV	In Service
Y3-099	Beckjord 2 MW-1	In Service
Y3-100	Beckjord 2 MW-2	Deactivated
Z1-065	Wiley 34.5kV	In Service
Z2-087	Pontiac MidPoint-Brokaw 345kV	In Service
J1022	MISO	MISO
J1027	MISO	MISO
J1028	MISO	MISO
J1055	MISO	MISO
J1063	MISO	MISO
J1067	MISO	MISO
J1069	MISO	MISO
J1074	MISO	MISO
J1102	MISO	MISO
J1115	MISO	MISO
J1139	MISO	MISO
J1152	MISO	MISO
J1189	MISO	MISO
J446	MISO	MISO
J468	MISO	MISO
J474	MISO	MISO
J513	MISO	MISO
J515	MISO	MISO
J641	MISO	MISO

Queue Number	Project Name	Status
J644	MISO	MISO
J750	MISO	MISO
J756	MISO	MISO
J757	MISO	MISO
J759	MISO	MISO
J762	MISO	MISO
J783	MISO	MISO
J800	MISO	MISO
J805	MISO	MISO
J811	MISO	MISO
J815	MISO	MISO
J826	MISO	MISO
J829	MISO	MISO
J837	MISO	MISO
J838	MISO	MISO
J845	MISO	MISO
J848	MISO	MISO
J856	MISO	MISO
J883	MISO	MISO
J903	MISO	MISO
J912	MISO	MISO
J913	MISO	MISO
J949	MISO	MISO
J955	MISO	MISO
J968	MISO	MISO
J979	MISO	MISO
J991	MISO	MISO
J992	MISO	MISO
J993	MISO	MISO

10.9 Contingency Descriptions

Contingency Name	Contingency Definition
COMED_P1-2_345-L11212_B-S-C	CONTINGENCY 'COMED_P1-2_345-L11212_B-S-C' TRIP BRANCH FROM BUS 939400 TO BUS 270704 CKT 1 / AE1-172 TAP 345 LORET; B 345 END
AEP_P7-1_#11042-A	CONTINGENCY 'AEP_P7-1_#11042-A' OPEN BRANCH FROM BUS 958970 TO BUS 255205 CKT 1 / 958970 AF2-188 TAP 345 255205 17REYNOLDS 345 1 OPEN BRANCH FROM BUS 243878 TO BUS 255205 CKT 2 / 243878 05MEADOW 345 255205 17REYNOLDS 345 2 END
AEP_P7-1_#11042-B	CONTINGENCY 'AEP_P7-1_#11042-B' OPEN BRANCH FROM BUS 243878 TO BUS 958970 CKT 1 / 243878 05MEADOW 345 958970 AF2-188 TAP 1 OPEN BRANCH FROM BUS 243878 TO BUS 255205 CKT 2 / 243878 05MEADOW 345 255205 17REYNOLDS 345 2 END
COMED_P1-2_345-L11212_B-S-B	CONTINGENCY 'COMED_P1-2_345-L11212_B-S-B' TRIP BRANCH FROM BUS 934720 TO BUS 939400 CKT 1 / AD1-100 TAP 345 AE1-172 TAP 345 END
AEP_P1-2_#10136	CONTINGENCY 'AEP_P1-2_#10136' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243209 TO BUS 243443 CKT 2 / 243209 05ROCKPT 765 243443 05RKG2 26.0 2 REMOVE UNIT 2H FROM BUS 243443 / 243443 05RKG2 26.0 REMOVE UNIT 2L FROM BUS 243443 / 243443 05RKG2 26.0 END

Contingency Name	Contingency Definition
AEP_P1-2_#709	CONTINGENCY 'AEP_P1-2_#709' OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 END
COMED_P1-2_345-L8014___-S-A	CONTINGENCY 'COMED_P1-2_345-L8014___-S-A' TRIP BRANCH FROM BUS 270853 TO BUS 935000 CKT 1 / PONTIAC ; R 345 AD1-133 TAP 345 END
AEP_P1-2_#8807-A	CONTINGENCY 'AEP_P1-2_#8807-A' OPEN BRANCH FROM BUS 243878 TO BUS 255205 CKT 2 / 243878 05MEADOW 345 255205 17REYNOLDS 345 2 END
AEP_P4_#6189_05HANG R 765_D1	CONTINGENCY 'AEP_P4_#6189_05HANG R 765_D1' OPEN BRANCH FROM BUS 242921 TO BUS 242924 CKT 1 / 242921 05CORNU 765 242924 05HANG R 765 1 OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 242921 TO BUS 242934 CKT 1 / 242921 05CORNU 765 242934 05CORNU 345 1 REMOVE UNIT 1A FROM BUS 247245 / 247245 05HRKG1A 18.0 REMOVE UNIT 1B FROM BUS 247246 / 247246 05HRKG1B 18.0 REMOVE UNIT 1S FROM BUS 247247 / 247247 05HRKG1S 18.0 REMOVE UNIT 2A FROM BUS 247248 / 247248 05HRKG2A 18.0 REMOVE UNIT 2B FROM BUS 247249 / 247249 05HRKG2B 18.0 REMOVE UNIT 2S FROM BUS 247250 / 247250 05HRKG2S 18.0 END

Contingency Name	Contingency Definition
COMED_P1-2_345-L17802__S	CONTINGENCY 'COMED_P1-2_345-L17802__S' TRIP BRANCH FROM BUS 270668 TO BUS 270912 CKT 1 / BLUEM; B 345 CHESTNUT 345 END
AEP_P1-2_#8905	CONTINGENCY 'AEP_P1-2_#8905' OPEN BRANCH FROM BUS 243217 TO BUS 247712 CKT 1 / 243217 05DEQUIN 345 247712 05SULLIVAN 345 1 END
AEP_P1-2_#10135	CONTINGENCY 'AEP_P1-2_#10135' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243209 TO BUS 243442 CKT 1 / 243209 05ROCKPT 765 243442 05RKG1 26.0 1 REMOVE UNIT 1H FROM BUS 243442 / 243442 05RKG1 26.0 REMOVE UNIT 1L FROM BUS 243442 / 243442 05RKG1 26.0 END
AEP_P4_#8906_05SULLIVAN 345_C	CONTINGENCY 'AEP_P4_#8906_05SULLIVAN 345_C' OPEN BRANCH FROM BUS 243216 TO BUS 247712 CKT 1 / 243216 05DARWIN 345 247712 05SULLIVAN 345 1 OPEN BRANCH FROM BUS 243217 TO BUS 247712 CKT 1 / 243217 05DEQUIN 345 247712 05SULLIVAN 345 1 END
AEP_P4_#8648_05JEFRSO 765_B	CONTINGENCY 'AEP_P4_#8648_05JEFRSO 765_B' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 242865 CKT 2 / 243208 05JEFRSO 765 242865 05JEFRSO 345 2 OPEN BRANCH FROM BUS 242865 TO BUS 248000 CKT Z1 / 242865 05JEFRSO 345 248000 06CLIFTY 345 Z1 END

Contingency Name	Contingency Definition
AEP_P1-2_#363	CONTINGENCY 'AEP_P1-2_#363' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 END
COMED_P1-2_345-L8014___-S-B	CONTINGENCY 'COMED_P1-2_345-L8014___-S-B' TRIP BRANCH FROM BUS 935000 TO BUS 270717 CKT 1 / AD1-133 TAP 345 DRESDEN ; R 345 END
Base Case	
AEP_P4_#8910_05DEQUIN 345_C	CONTINGENCY 'AEP_P4_#8910_05DEQUIN 345_C' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2 OPEN BRANCH FROM BUS 243217 TO BUS 247712 CKT 1 / 243217 05DEQUIN 345 247712 05SULLIVAN 345 1 END
AEP_P4_#1760_05JEFRSO 765_A	CONTINGENCY 'AEP_P4_#1760_05JEFRSO 765_A' OPEN BRANCH FROM BUS 243207 TO BUS 243208 CKT 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 END
AEP_P1-2_#8695-B	CONTINGENCY 'AEP_P1-2_#8695-B' OPEN BRANCH FROM BUS 958970 TO BUS 255205 CKT 1 / 958970 AF2-188 TAP 345 255205 17REYNOLDS 345 345 1 END
COMED_P1-2_345-L8002___-S	CONTINGENCY 'COMED_P1-2_345-L8002___-S' TRIP BRANCH FROM BUS 270852 TO BUS 270668 CKT 1 / PONTI; B 345 BLUEM; B 345 END

11 Light Load Analysis

The Queue Project AF2-008 was evaluated as a 5.0 MW (Capacity 5.0 MW) injection as an uprate to AF1-088 at the Sullivan 345 kV substation in the AEP area. Project AF2-008 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-008 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

11.1 Light Load Deliverability

(Single or N-1 contingencies)

None.

11.2 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies)

None.

11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPAC T
96031727	939400	AE1-172 TAP	345.0	CE	934720	AD1-100 TAP	345.0	CE	1	COMED_P4_012-45-BT12-14	breaker	1528.0	110.52	111.81	AC	29.99
96032186	939400	AE1-172 TAP	345.0	CE	934720	AD1-100 TAP	345.0	CE	1	COMED_P1-2_345-L8014___S-B	single	1528.0	107.29	108.57	AC	29.63
96032187	939400	AE1-172 TAP	345.0	CE	934720	AD1-100 TAP	345.0	CE	1	COMED_P1-2_345-L8014___S-A	single	1528.0	107.29	108.57	AC	29.63

11.4 Potential Congestion due to Local Energy Deliverability

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

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection

Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPAC T
96032182	939400	AE1-172 TAP	345.0	CE	934720	AD1-100 TAP	345.0	CE	1	COMED_P1-2_345-L8014-S-A	operation	1528.0	107.82	109.1	AC	29.63

11.5 System Reinforcements

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-008	Upgrade Number
96032186,96032187,96031727	1	AE1-172 TAP 345.0 kV - AD1-100 TAP 345.0 kV Ckt 1	Same as Summer Peak upgrade.	\$0	\$0	
			TOTAL COST	\$0	\$0	

Note : For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

11.6 Flow Gate Details

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

11.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
96031727	939400	AE1-172 TAP	CE	934720	AD1-100 TAP	CE	1	COMED_P4_012-45-BT12-14	breaker	1528.0	110.52	111.81	AC	29.99

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274853	TWINGROVE;U1	6.0781	50/50	6.0781
274854	TWINGROVE;U2	6.0781	50/50	6.0781
274863	CAYUGA RI;1U	7.2181	50/50	7.2181
274864	CAYUGA RI;2U	7.2181	50/50	7.2181
274880	GENERATOR;	5.5751	50/50	5.5751
274882	W4-005 E	31.8365	50/50	31.8365
274890	CAYUG;1U E	28.8725	50/50	28.8725
274891	CAYUG;2U E	28.8725	50/50	28.8725
276153	W2-048 E	6.8962	50/50	6.8962
290261	S-027 E	24.3125	50/50	24.3125
290265	S-028 E	24.3125	50/50	24.3125
909052	X2-022 E	20.7439	50/50	20.7439
917501	Z2-087 C	5.0937	50/50	5.0937
917502	Z2-087 E	34.0887	50/50	34.0887
924041	AB2-047 C O1	12.7343	50/50	12.7343
924042	AB2-047 E O1	85.2217	50/50	85.2217
924261	AB2-070 C O1	6.0798	50/50	6.0798
924262	AB2-070 E O1	40.6882	50/50	40.6882
925771	AC1-053 C	5.9702	50/50	5.9702
925772	AC1-053 E	39.9546	50/50	39.9546
926841	AC1-171 C O1	0.4983	Adder	0.59
926842	AC1-171 E O1	3.3287	Adder	3.92
935141	AD1-148	10.8133	50/50	10.8133
936971	AD2-131 C	1.6591	50/50	1.6591
936972	AD2-131 E	8.3354	50/50	8.3354
937211	AD2-159 C	8.0692	50/50	8.0692
937212	AD2-159 E	37.7783	50/50	37.7783
939401	AE1-172 C O1	23.7816	50/50	23.7816
939402	AE1-172 E O1	111.5826	50/50	111.5826
940101	AE1-252 C O1	0.0007	50/50	0.0007
940102	AE1-252 E O1	99.5325	50/50	99.5325
941731	AE2-173 O1	24.4890	50/50	24.4890
942111	AE2-223 C	7.6406	50/50	7.6406
942112	AE2-223 E	51.1330	50/50	51.1330
942601	AE2-276	2.5492	Adder	3.0
944201	AF1-088 FTIR	59.9800	Merchant Transmission	59.9800
944221	AF1-090 C O1	5.0781	50/50	5.0781
944222	AF1-090 E O1	23.7747	50/50	23.7747
945391	AF1-204 C O1	3.0666	Adder	3.61
945392	AF1-204 E O1	9.1997	Adder	10.82
945871	AF1-252 O1	11.2526	50/50	11.2526
945881	AF1-253 O1	7.7903	50/50	7.7903
951631	J456 C	1.4646	PJM External (MISO)	1.4646
951632	J456 E	7.9239	PJM External (MISO)	7.9239

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952651	J756 C	4.7475	PJM External (MISO)	4.7475
952652	J756 E	25.6853	PJM External (MISO)	25.6853
952871	J757 C	6.1016	PJM External (MISO)	6.1016
952872	J757 E	33.0112	PJM External (MISO)	33.0112
953741	J826 C	3.1523	PJM External (MISO)	3.1523
953742	J826 E	17.0547	PJM External (MISO)	17.0547
953851	J845 C	3.0645	PJM External (MISO)	3.0645
953852	J845 E	16.5795	PJM External (MISO)	16.5795
953881	J848 C	5.8929	PJM External (MISO)	5.8929
953882	J848 E	31.8821	PJM External (MISO)	31.8821
954721	J750 C	3.8105	PJM External (MISO)	3.8105
954722	J750 E	20.6155	PJM External (MISO)	20.6155
954761	J468 C	3.0745	PJM External (MISO)	3.0745
954762	J468 E	17.4224	PJM External (MISO)	17.4224
955031	J979 C	4.7143	PJM External (MISO)	4.7143
955032	J979 E	25.5057	PJM External (MISO)	25.5057
955401	J1022 C	4.7284	PJM External (MISO)	4.7284
955402	J1022 E	25.5821	PJM External (MISO)	25.5821
955441	J1026 C	3.3209	PJM External (MISO)	3.3209
955442	J1026 E	17.9671	PJM External (MISO)	17.9671
955711	J1055 C	2.3738	PJM External (MISO)	2.3738
955712	J1055 E	12.8427	PJM External (MISO)	12.8427
956281	J1115 C	7.8293	PJM External (MISO)	7.8293
956282	J1115 E	42.3587	PJM External (MISO)	42.3587
957141	AF2-008 FTIR	29.9900	Merchant Transmission	29.9900
958013	AF2-095 BAT	4.5680	50/50	4.5680
958023	AF2-096 BAT	9.1297	50/50	9.1297
959611	AF2-252 C	7.6744	50/50	7.6744
959612	AF2-252 E	11.5116	50/50	11.5116
960603	AF2-351 BAT	2.2840	50/50	2.2840
960611	AF2-352 C	7.6744	50/50	7.6744
960612	AF2-352 E	11.5116	50/50	11.5116
AD2-098	AD2-098	0.3480	LTF	0.3480

11.7 Queue Dependencies

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

Queue Number	Project Name	Status
AB2-047	Brokaw-Pontiac Midpoint	In Service
AB2-070	Mt. Pulaski-Brokaw	Under Construction
AC1-053	Lanesville-Brokaw	Active
AC1-171	Powerton	Active
AD1-148	Brokaw-Lanesville	Active
AD2-098	PJM-WEC	Confirmed
AD2-131	Kincaid-Pana 345kV	Active
AD2-159	Chestnut 345kV	Active
AE1-172	Loretto-Wilton Center	Active
AE1-252	Loretto-Wilton Center	Active
AE2-173	McLean 345 kV	Active
AE2-223	McLean 345 kV	Active
AE2-276	Sullivan 345kV	Active
AF1-088	Sullivan 345 kV	Active
AF1-090	Kincaid-Pana	Active
AF1-204	Eugene 345 kV	Active
AF1-252	Kincaid-Pana	Active
AF1-253	Kincaid-Pana	Active
AF2-008	Sullivan 345 kV	Active
AF2-095	Davis Creek 138 kV	Active
AF2-096	Braidwood-East Frankfort 345 kV	Active
AF2-252	Blue Mound 345 kV	Active
AF2-351	Kensington 138 kV	Active
AF2-352	Blue Mound 345 kV	Active
W2-048	Brokaw-Lanesville	In Service
W4-005	Blue Mound-Latham	In Service
X2-022	Brokaw-Lanesville	In Service
Z2-087	Pontiac MidPoint-Brokaw 345kV	In Service
J1022	MISO	MISO
J1026	MISO	MISO
J1055	MISO	MISO
J1115	MISO	MISO
J456	MISO	MISO
J468	MISO	MISO
J750	MISO	MISO
J756	MISO	MISO
J757	MISO	MISO
J826	MISO	MISO
J845	MISO	MISO
J848	MISO	MISO
J979	MISO	MISO

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
COMED_P4_012-45-BT12-14	CONTINGENCY 'COMED_P4_012-45-BT12-14' TRIP BRANCH FROM BUS 270717 TO BUS 930740 CKT 1 / DRESDEN ; R 345 AB1-122 TAP 345 TRIP BRANCH FROM BUS 935000 TO BUS 270717 CKT 1 / AD1-133 TAP 345 DRESDEN ; R 345 END
COMED_P1-2_345-L8014___-S-A	CONTINGENCY 'COMED_P1-2_345-L8014___-S-A' TRIP BRANCH FROM BUS 270853 TO BUS 935000 CKT 1 / PONTIAC ; R 345 AD1-133 TAP 345 END
COMED_P1-2_345-L8014___-S-B	CONTINGENCY 'COMED_P1-2_345-L8014___-S-B' TRIP BRANCH FROM BUS 935000 TO BUS 270717 CKT 1 / AD1-133 TAP 345 DRESDEN ; R 345 END

12 Short Circuit Analysis

The following Breakers are overdutied

None.

13 Stability and Reactive Power

(Summary of the VAR requirements based upon the results of the dynamic studies)

To be determined in the Facilities Study Phase.

14 N-1-1 Analysis

To be determined in the Facilities Study Phase.

15 Load Deliverability Analysis

To be determined in the Facilities Study Phase.

16 Affected Systems

16.1 MISO

Preliminary MISO impacts have been identified. Please refer to the MISO Affected System report for details. Final MISO impacts to be determined by MISO during the Facilities Study phase.

16.2 LG&E

To be determined during the Facilities Study. An LG&E Affected System Study may be required.

17 Attachment 1: One Line Diagram and Project Site Location



