Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-012

TAIT 69 KV

104 MW Capacity / 104 MW Energy

July 2020

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1 Introduction

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

2 Preface

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

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

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

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

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3 General

The Interconnection Customer (IC) has proposed an uprate to an existing Natural Gas generating facility located in Montgomery, Ohio. This project is an increase to the Tait Generation Station. The AF2-012 queue position is a 104 MW uprate (104 MW Capacity uprate) to the Tait Generation Station. The proposed in-service date for this uprate project is May 28, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-012
Project Name	TAIT 69 KV
State	Ohio
County	Montgomery
Transmission Owner	Dayton
MFO	794
MWE	104
MWC	104
Fuel	Natural Gas
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.

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4 Point of Interconnection

The AF2-012 "Tait 69 KV" uprate project will interconnect with The Dayton Power & Light Company transmission system via the existing Tait CT substation.

The point of interconnection (POI) has a double bus-double breaker configuration. One additional 69 KV breaker will be installed at the substation to interconnect the proposed facility as shown in Attachment 1. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct facilities on their side of the interconnection and land for Dayton's interconnection substation.

The new facility would prefer to interconnect into the Tait CT Substation which is the same location the existing seven GE 7EA generation units tie into the grid. The alternative would be to tie into the Tait Substation which is the location of the tie in of the four diesel generation units located on the Tait site. The Tait Substation is located immediately next to the Tait CT Substation.

Attachment 1 shows a one-line diagram of the proposed connection of the (AF2-012) generation project to the Dayton Power & Light transmission system. Attachment 2 provides the proposed location for the point of interconnection. IC will be responsible for constructing all of the facilities on its side of the POI including the attachment line.

5 Cost Summary

The AF2-012 "Tait 69 KV" project is responsible for the interconnection facilities to the Dayton Power and Light system. AF2-012 "Tait 69 kV" will share the same interconnection facilities as AF1-011

The AF2-012 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 1,230,000
Total System Network Upgrade Costs	$12,800,600
Total Costs	**$14,030,600**

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

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

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of the AF2-012 generation project to the Dayton Transmission System is detailed in the following sections. The

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associated one-line with the generation project attachment facilities and primary direct and non-direct connection are shown in Attachment 1.

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

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6 Transmission Owner Scope of Work

The AF2-012 project will use the existing interconnection facilities, so the only Transmission Owner work associated with this project is to provide engineering oversight and make remote relay setting changes at the AF2-012 interconnection substation and other related adjacent substations.

This report assumes that the Interconnection Customer will use the existing attachment line from its generating facility into the proposed Point of Interconnection since this project is an upgrade to the existing generators as depicted on the one line diagram in Attachment 1. The IC will also be responsible for the fiber/OPGW that Dayton requires on the generator line for the communication assisted trip scheme. The costs included below are for the necessary protection system review and any subsequent field changes needed to coordinate with IC attachment facilities.

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
Engineering review and commissioning	$15,000
Total Attachment Facility Costs	**$15,000**

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
Tait 69 kV Substation - relay setting changes	$15,000
Install one 69 kV breaker at the Tait CT Substation to interconnect the AF2-012 project. This will include the installation of all physical structures, P&C equipment, communications equipment, metering equipment, and associated facilities.	1,200,000
Total Non-Direct Connection Facility Costs	**$1,215,000**

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7 Schedule

Based on the extent of the Dayton primary Attachment Facilities and Non-Direct Connection work required to support the AF2-012 generation project, it is expected to take a minimum of **eighteen (18) months** from the date of a fully executed Interconnection Construction Service Agreement to complete the installation. This includes the requirement for the IC to make a preliminary payment to Dayton which funds the Non-Direct Connection work and the first three months of engineering design that is related to the construction of the Attachment Facilities. It further assumes that the IC will provide all rights-of-way, permits, easements, etc. that will be needed. A further assumption is that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined Attachment Facilities and Non-Direct Connection work, and that all system outages will be allowed when requested.

8 Summer Peak - Load Flow Analysis (underlying transmission <100 kV system)

8.1 Power Flow Analysis & System Reinforcements

Dayton identified the following violation on their lower voltage system:

Id	Violation Description	kV
AF2-012-L1	Overload on Dixie - Kettering 69 kV Contingency: DAY_6605_TAIT TURBINE_OVERLOOK_69KV (Tait - Overlook 69 kV) Notes: Contingency causes MW flow to Overlook redirected from Tait through Dixie & Kettering. Overload due to addition of AF2-012 generator. Contingency Flow: 155 MVA	69 kV
AF2-012-L2	Overload on Dixie - Tait E 69 kV Contingency: DAY_6605_TAIT TURBINE_OVERLOOK_69KV (Tait - Overlook 69 kV) Notes: Contingency causes MW flow to Overlook redirected from Tait through Dixie & Kettering. Overload due to addition of AF2-012 generator. Current Rating: 151, 187 MVA Contingency Flow: 194 MVA	69 kV
AF2-012-L3	Overload on Moraine - Tait E 69 kV Contingency: DAY_6909_TAIT TURBINE_DIXIE_69KV (Tait - Dixie 69 kV) Notes: Contingency causes MW flow to Overlook redirected from Tait through Moraine & Tait W. Overload due to addition of AF2-012 generator. Contingency Flow: 172 MVA	69 kV
AF2-012-L4	Overload on Overlook - Tait W 69 kV Contingency: DAY_6909_TAIT TURBINE_DIXIE_69KV (Tait - Dixie 69 kV) Notes: Contingency causes MW flow to Overlook redirected from Tait through Moraine & Tait W. Overload due to addition of AF2-012 generator. Contingency Flow: 185 MVA	69 kV

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Additionally, Dayton performed an analysis of its underlying transmission <100 kV system. The following issues were found to be existing in the Dayton transmission system.

Facility	Contingency Description	Existing Upgrade	Cost
253181 09NHOLLN 69 kV - 253201 09ROBINS 69 kV Ckt 1	Adkins – Beatty 345 kV	PJM Network Upgrade, N5456: From AC1-166, replace wave trap with 2000A wave trap. Project Cost: $56,000 Time Estimate: 20 weeks	$56,000
253099 09ATLNTA 69 kV - 253100 09ATLNTA 345 kV Ckt 1	Atlanta – New Holland 69 kV Robinson – New Holland 69 kV	Reinforcement Project, r190012: Add a second 250 MVA 345/69kV transformer. Project Cost: $5,000,000 Time Estimate: 24 months	$5,000,000
		TOTAL COST	

This project does not currently have a financial responsibility towards these upgrades, but may get an allocation based on projects withdrawing from the queue. Allocations to upgrades are determined in the System Impact phase. The upgrades may need to be completed prior to initial operation of this facility.

8.2 Generation Delivery/Multiple Facility Contingency

At the Primary POI, the AF2-012 project contributes overloads on the Dayton transmission system as shown in the "Network Impacts" section of the report. The estimated cost of the system reinforcements necessary to mitigate these overloads are also provided.

From Bus Number	From Bus Name	From Bus Area	To Bus Number	To Bus Name	To Bus Area	CKT ID	kV	Contingency Description
253023	09DIXIET	DAY	253037	09KETTER	DAY	1	69.0	Loss of Tait W – Overlook 69 kV
253023	09DIXIET	DAY	253222	09TAIT E	DAY	1	69.0	Loss of Tait W – Overlook 69 kV
253051	09MORAIN	DAY	253222	09TAIT E	DAY	1	69.0	Loss of Tait E – Dixie 69 kV
253061	09OVERLK	DAY	253223	09TAIT W	DAY	1	69.0	Loss of Tait E – Dixie 69 kV

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9 Interconnection Customer Requirements

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

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

1. An Interconnection Customer entering the New Services Queue on or after October 1, 2012 with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

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

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 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/

11 System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in Dayton's "Requirements for the connection of Facilities to the Dayton Power & Light company Transmission System" document located at: https://www.pjm.com/planning/design-engineering/to-tech-standards/private-dayton.aspx. Preliminary Protection requirements will be provided as part of the Facilities Study. Detailed Protection Requirements will be provided once the project enters the construction phase.

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12 Compliance Issues and Interconnection Customer Requirements

The Dayton Power and Light Company (DP&L) has prepared this Facilities Connection Requirements document to ensure compliance with North American Electric Reliability Council (NERC) Reliability Standards and applicable Regional Reliability Organization, sub regional, Power Pool, and individual Transmission Owner planning criteria and facility connection requirements in compliance to NERC Standard FAC-001-2. These connection requirements apply to all generation facilities, transmission facilities, and end-users connecting to the DP&L transmission system. Detailed information outlining DP&L interconnection requirements can be reviewed utilizing the following link:

https://www.pjm.com/~/media/planning/plan-standards/private-dayton/dayton-facilities-connection-requirements.ashx

13 Power Factor Requirements

The IC shall design its synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading (absorbing VARs) to 0.90 lagging (supplying VARs) measured at the generator terminals.

14 Summer Peak - Load Flow Analysis (Transmission System) – Primary POI

The Queue Project AF2-012 was evaluated as a 104.0 MW (Capacity 104.0 MW) injection as an uprate to Tait Generation at the Tait 69 kV substation in the Dayton area. Project AF2-012 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-012 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

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14.1 Generation Deliverability

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

None

14.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
9517261 8	24345 4	05BIXB Y	345. 0	AEP	24345 9	05KIR K	345. 0	AEP	1	AEP_P4_#3196_05BEA TTY 345_302E	break er	1409. 0	99.65	100.03	DC	11.94

14.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
951725 28	24345 3	05BEAT TY	345. 0	AEP	24345 4	05BIXB Y	345. 0	AEP	1	AEP_P4_#3196_05BE ATTY 345_302E	break er	1203. 0	121.3	121.88	DC	15.42
951725 29	24345 3	05BEAT TY	345. 0	AEP	24345 4	05BIXB Y	345. 0	AEP	1	AEP_P4_#10715_05C OLE 345_C	break er	1203. 0	120.79	121.35	DC	14.95
951725 82	24345 3	05BEAT TY	345. 0	AEP	24402 2	05COL E	345. 0	AEP	1	AEP_P4_#3195_05BE ATTY 345_304E	break er	1203. 0	108.62	109.08	DC	12.29

14.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
9517282 3	24345 3	05BEATT Y	345. 0	AEP	24345 4	05BIXBY	345. 0	AEP	1	AEP_P1-2_#1013 7	operatio n	1203. 0	113.41	113.98	DC	14.95

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ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
9517287 8	94563 0	AF1-228 TAP	345. 0	DAY	24345 3	05BEATT Y	345. 0	AEP	1	DAY_P1-2_#762	operatio n	1374. 0	105.25	105.86	DC	18.68

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14.5 System Reinforcements - Summer Peak Load Flow (Transmission) – Primary POI

ID	Idx	Facility	Upgrade Description	Cost
95172582	3	**05BEATTY 345.0 kV - 05COLE 345.0 kV Ckt 1**	AEP **AEPO0001a (389) : Upgrade/Replace 3-345kV 1600A switches at Beatty station** **Project Type : FAC** **Cost : $1,500,000** **Time Estimate : 12-18 Months**	$1,500,000
95172618	1	**05BIXBY 345.0 kV - 05KIRK 345.0 kV Ckt 1**	AEP **AEPO0038d (489) : Sag Study will be required on 37.9 miles of line between Bixby and kirk .The cost is expected to be 151,600.New Ratings after sag study : S/N: 1409MVA S/E: 1887 MVA.Rebuild/Reconductor, cost : $ 75.8 million** **Project Type : FAC** **Cost : $151,600** **Time Estimate : Sag Study : 6 - 12 months Months** AEP **s1510.1 (532) : PJM solution at Kirk, Install 4-345kV 3,000A CBs & end bus and complete the 345kV breaker and a half configuration. Replace 345/138kV XF with 675 MVA unit. Connect in different 345kV bay and on new 138kV string before removing old unit. SN: 870 SE: 1017) and are necessary.** **Project Type : FAC** **Cost : $0** **Time Estimate : Months** AEP **s1510.2 (533) : PJM solution at Bixby, replace Kirk 345kV line risers and line switch and upgrade relaying. SN: 1409, SE: 1409** **Project Type : FAC** **Cost : $0** **Time Estimate : Months**	$151,600
95172529,95172528	2	**05BEATTY 345.0 kV - 05BIXBY 345.0 kV Ckt 1**	AEP **AEPO0003a (394) : Upgrade/Replace Three 345kV 1600A switches at Beatty station** **Project Type : FAC** **Cost : $1,500,000** **Time Estimate : 12-18 Months** AEP **AEPO0003b (395) : 1) A sag study will be required on the 9.5 miles of ACSR ~ 954 ~ 45/7 ~ Bundled - Conductor Section 1 to mitigate the overload. Depending on the sag study results, the cost for this upgrade is expected to be between $38,000 (no remediation required, just sag study) and $19 million (complete line reconductor/rebuild). New rating after sag study: S/N: 1409 S/E: 1887. Time Estimate: a) Sag Study: 6-12 months. b) Rebuild: The standard time required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement.** **Project Type : FAC** **Cost : $38,000** **Time Estimate : 12-18 Months**	$1,538,000

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ID	Idx	Facility	Upgrade Description	Cost
AF2-012-L1	N/A	**Dixie - Kettering 69 kV**	Dayton **DAYr20004 : Relay loadability to increase line rating** **Project Type : FAC** **Cost : $58,000** **Time Estimate : 24 Months**	$58,000
AF2-012-L2	N/A	**Dixie - Tait E 69 kV**	Dayton **DAYr20005 : Relay loadability to increase line rating** **Project Type : FAC** **Cost : $58,000** **Time Estimate : 24 Months**	$58,000
AF2-012-L3	N/A	**Moraine - Tait E 69 kV**	Dayton **DAYr20006 : Replace transmission conductor to increase line rating.** **Project Type : FAC** **Cost : $1,859,000** **Time Estimate : 18 Months**	$1,859,000
AF2-012-L4	N/A	**Overlook - Tait W 69 kV**	Dayton **DAYr20007 : Replace transmission and underground conductor to increase line rating.** **Project Type : FAC** **Cost : $7,636,000** **Time Estimate : 18 Months**	$7,636,000
			TOTAL COST	**$12,800,600**

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14.6 Flow Gate Details - Primary POI

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

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14.6.1 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
95172618	243454	05BIXBY	AEP	243459	05KIRK	AEP	1	AEP_P4_#3196_05BEATTY 345_302E	breaker	1409.0	99.65	100.03	DC	11.94

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
250164	08BKJDB1	0.1408	Adder	0.17
250165	08BKJDB2	0.1408	Adder	0.17
251827	WILLYESP	0.4289	Adder	0.5
251828	CLNTESP1	0.4910	Adder	0.58
251829	CLNTESP2	0.3274	Adder	0.39
253110	09ADKINS	25.9041	50/50	25.9041
904722	V4-073 E	0.1570	Adder	0.18
913222	Y1-054 E	1.4236	Adder	1.67
918802	AA1-099 E	0.3274	Adder	0.39
923522	AB1-169 C OP	139.5900	50/50	139.5900
924351	AB2-083 C O1	4.8329	50/50	4.8329
924352	AB2-083 E O1	2.2743	50/50	2.2743
924371	AB2-085 C O1	5.1696	Adder	6.08
924372	AB2-085 E O1	2.4328	Adder	2.86
925341	AC1-001 C O1	9.6658	50/50	9.6658
925342	AC1-001 E O1	4.5486	50/50	4.5486
925921	AC1-068 C	9.0369	50/50	9.0369
925922	AC1-068 E	4.2261	50/50	4.2261
925931	AC1-069 C	9.0369	50/50	9.0369
925932	AC1-069 E	4.2261	50/50	4.2261
925981	AC1-074 C O1	3.9360	Adder	4.63
925982	AC1-074 E O1	1.6869	Adder	1.98
926011	AC1-078 C O1	6.5766	Adder	7.74
926012	AC1-078 E O1	10.9610	Adder	12.9
926061	AC1-085 C	20.2692	50/50	20.2692
926062	AC1-085 E	33.0708	50/50	33.0708
926101	**AC1-089 C O1 (Suspended)**	**4.7316**	**Adder**	**5.57**
926102	**AC1-089 E O1 (Suspended)**	**7.7200**	**Adder**	**9.08**
926791	AC1-165 C	8.9305	50/50	8.9305
926792	AC1-165 E	4.3324	50/50	4.3324
926801	AC1-166 C	8.9305	50/50	8.9305
926802	AC1-166 E	4.3324	50/50	4.3324
927061	AC1-194 C O1	2.8085	Adder	3.3
927062	AC1-194 E O1	4.5823	Adder	5.39
930062	AB1-014 E	7.2779	Adder	8.56
932201	AC2-029 C	4.9625	50/50	4.9625
932202	AC2-029 E	8.0967	50/50	8.0967
932381	AC2-055 C	3.1941	50/50	3.1941

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
932382	AC2-055 E	5.2115	50/50	5.2115
932411	AC2-059 C	13.0575	50/50	13.0575
932412	AC2-059 E	13.4753	50/50	13.4753
932421	AC2-060 C	11.3254	50/50	11.3254
932422	AC2-060 E	6.3706	50/50	6.3706
932431	AC2-061 C	4.8644	Adder	5.72
932432	AC2-061 E	4.9314	Adder	5.8
932462	AC2-066 E	4.3667	Adder	5.14
932481	AC2-068 C	2.4199	Adder	2.85
932482	AC2-068 E	3.9631	Adder	4.66
932551	AC2-075 C	0.9348	Adder	1.1
932552	AC2-075 E	0.4709	Adder	0.55
932661	AC2-088 C O1	3.7291	Adder	4.39
932662	AC2-088 E O1	3.0688	Adder	3.61
934481	AD1-072 C	2.8685	50/50	2.8685
934482	AD1-072 E	1.3099	50/50	1.3099
934491	AD1-073 C	2.3359	50/50	2.3359
934492	AD1-073 E	1.2033	50/50	1.2033
934561	AD1-081 C	1.3153	Adder	1.55
934562	AD1-081 E	0.6776	Adder	0.8
935031	AD1-136 C	0.5244	Adder	0.62
935032	AD1-136 E	0.4467	Adder	0.53
935041	AD1-140 C O1	8.4500	Adder	9.94
935042	AD1-140 E O1	6.9858	Adder	8.22
936111	AD2-016 C	13.0575	50/50	13.0575
936112	AD2-016 E	13.4753	50/50	13.4753
936251	AD2-031 C O1	2.5920	50/50	2.5920
936252	AD2-031 E O1	4.2290	50/50	4.2290
936381	AD2-048 C	3.2653	Adder	3.84
936382	AD2-048 E	1.6292	Adder	1.92
937231	AD2-162 C	14.9126	50/50	14.9126
937232	AD2-162 E	7.3118	50/50	7.3118
938051	AE1-007 C	0.6940	Adder	0.82
938052	AE1-007 E	1.1323	Adder	1.33
938271	AE1-040 C O1	5.7901	50/50	5.7901
938272	AE1-040 E O1	2.9134	50/50	2.9134
938711	AE1-093	2.4833	Adder	2.92
938921	AE1-120	4.1320	Adder	4.86
939141	AE1-144 C O1	6.6200	Adder	7.79
939142	AE1-144 E O1	3.2852	Adder	3.86
940531	AE2-038 C O1	4.4161	Adder	5.2
940532	AE2-038 E O1	2.1874	Adder	2.57
941411	AE2-138 C	13.5775	Adder	15.97
941412	AE2-138 E	5.0218	Adder	5.91
941511	AE2-148 C	126.2540	50/50	126.2540
941512	AE2-148 E	57.1051	50/50	57.1051
941521	AE2-149 C	100.9730	50/50	100.9730
941522	AE2-149 E	37.6310	50/50	37.6310
941981	AE2-210 C O1	4.6785	Adder	5.5
941982	AE2-210 E O1	1.7598	Adder	2.07
942051	AE2-217 C	7.0704	Adder	8.32
942052	AE2-217 E	4.7136	Adder	5.55

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942061	AE2-218 C	7.8720	Adder	9.26
942062	AE2-218 E	5.3470	Adder	6.29
942091	AE2-221 C	24.5628	50/50	24.5628
942092	AE2-221 E	16.3752	50/50	16.3752
942521	AE2-267 C O1	2.4053	Adder	2.83
942522	AE2-267 E O1	1.4868	Adder	1.75
942591	AE2-275 C O1	3.9980	Adder	4.7
942592	AE2-275 E O1	1.5038	Adder	1.77
942831	AE2-302 C O1	2.7320	Adder	3.21
942832	AE2-302 E O1	1.8213	Adder	2.14
942891	AE2-308 C O1	6.7367	Adder	7.93
942892	AE2-308 E O1	2.4497	Adder	2.88
942951	AE2-315	2.3810	Adder	2.8
942981	AE2-320 C O1	17.7814	50/50	17.7814
942982	AE2-320 E O1	8.7976	50/50	8.7976
943111	AE2-339 C	1.7793	Adder	2.09
943112	AE2-339 E	0.8764	Adder	1.03
943191	AE2-319 C O1	17.7814	50/50	17.7814
943192	AE2-319 E O1	8.7976	50/50	8.7976
943201	AE2-318 C	5.9987	Adder	7.06
943202	AE2-318 E	2.9280	Adder	3.44
943771	AF1-045	2.7941	Adder	3.29
943773	AF1-045 E	1.8657	Adder	2.19
943943	AF1-062 BAT	43.1660	50/50	43.1660
944521	AF1-117 C	37.9574	50/50	37.9574
944522	AF1-117 E	11.6926	50/50	11.6926
944621	AF1-127 C O1	3.7838	Adder	4.45
944622	AF1-127 E O1	1.8636	Adder	2.19
944941	AF1-159	1.5006	50/50	1.5006
945631	AF1-228 C	31.0973	50/50	31.0973
945632	AF1-228 E	20.7316	50/50	20.7316
945681	AF1-233 C	12.5360	Adder	14.75
945682	AF1-233 E	6.1931	Adder	7.29
945841	AF1-249 C	1.0988	Adder	1.29
945842	AF1-249 E	0.4081	Adder	0.48
945861	AF1-251 C	9.3833	Adder	11.04
945862	AF1-251 E	6.2555	Adder	7.36
945911	AF1-256 C	4.0102	Adder	4.72
945912	AF1-256 E	2.6735	Adder	3.15
946021	AF1-267 C	2.2226	Adder	2.61
946022	AF1-267 E	1.0212	Adder	1.2
946171	AF1-282 C	8.0010	50/50	8.0010
946172	AF1-282 E	5.3340	50/50	5.3340
946181	AF1-283 C	10.4013	50/50	10.4013
946182	AF1-283 E	6.9342	50/50	6.9342
946511	AF1-315 C O1	3.2375	Adder	3.81
946512	AF1-315 E O1	2.1583	Adder	2.54
957171	AF2-011 O1	1.0341	Adder	2.3
957181	AF2-012 O1	5.3772	Adder	11.94
957391	AF2-033 C	0.3651	Adder	0.81
957392	AF2-033 E	0.5476	Adder	1.22
957401	AF2-034 C	0.3764	Adder	0.84

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957402	AF2-034 E	0.3207	Adder	0.71
957721	AF2-066 C O1	2.1408	Adder	4.75
957722	AF2-066 E O1	1.4272	Adder	3.17
957731	AF2-067 C O1	1.0898	Adder	2.42
957732	AF2-067 E O1	0.7266	Adder	1.61
957851	AF2-079 C O1	4.0599	Adder	9.01
957852	AF2-079 E O1	2.7066	Adder	6.01
958171	AF2-111 C	7.0224	Adder	15.59
958172	AF2-111 E	4.6816	Adder	10.39
958291	AF2-123 C O1	0.7750	Adder	1.72
958292	AF2-123 E O1	1.0684	Adder	2.37
959073	AF2-198 BAT	3.6122	50/50	3.6122
959191	AF2-210 C	5.2854	Adder	11.73
959192	AF2-210 E	3.5236	Adder	7.82
959271	AF2-218 C O1	1.1631	Adder	2.58
959272	AF2-218 E O1	0.7757	Adder	1.72
959541	AF2-245 C	3.6839	Adder	8.18
959542	AF2-245 E	2.4559	Adder	5.45
960071	AF2-298 C O1	1.4618	Adder	3.24
960072	AF2-298 E O1	0.9778	Adder	2.17
960151	AF2-306	0.8868	Adder	1.97
960161	AF2-307 C	1.3507	Adder	3.0
960162	AF2-307 E	0.9004	Adder	2.0
960571	AF2-348 C	6.9345	Adder	15.39
960572	AF2-348 E	4.6230	Adder	10.26
960641	AF2-355 C O1	4.3430	Adder	9.64
960642	AF2-355 E O1	3.8604	Adder	8.57
960801	AF2-371 C	7.2894	50/50	7.2894
960802	AF2-371 E	4.8596	50/50	4.8596
961491	AF2-440 C	3.3098	50/50	3.3098
961492	AF2-440 E	3.3098	50/50	3.3098
WEC	WEC	0.6029	Confirmed LTF	0.6029
LGEE	LGEE	3.2016	Confirmed LTF	3.2016
CPLE	CPLE	0.6562	Confirmed LTF	0.6562
CBM-W2	CBM-W2	24.6191	Confirmed LTF	24.6191
NY	NY	0.8964	Confirmed LTF	0.8964
CBM-W1	CBM-W1	19.9910	Confirmed LTF	19.9910
TVA	TVA	4.0362	Confirmed LTF	4.0362
O-066	O-066	10.6243	Confirmed LTF	10.6243
CBM-S2	CBM-S2	8.3810	Confirmed LTF	8.3810
CBM-S1	CBM-S1	28.8828	Confirmed LTF	28.8828
G-007	G-007	1.6370	Confirmed LTF	1.6370
MEC	MEC	3.6944	Confirmed LTF	3.6944

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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
95172529	243453	05BEATTY	AEP	243454	05BIXBY	AEP	1	AEP_P4_#10715_05COLE 345_C	breaker	1203.0	120.79	121.35	DC	14.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
250164	08BKJDB1	0.1416	Adder	0.17
250165	08BKJDB2	0.1416	Adder	0.17
251827	WILLYESP	0.4544	Adder	0.53
251828	CLNTESP1	0.4610	Adder	0.54
251829	CLNTESP2	0.3073	Adder	0.36
253110	09ADKINS	35.6143	50/50	35.6143
904722	V4-073 E	0.1943	Adder	0.23
913222	Y1-054 E	1.4812	Adder	1.74
918802	AA1-099 E	0.3073	Adder	0.36
923522	AB1-169 C OP	123.9529	Adder	145.83
925921	AC1-068 C	11.9306	50/50	11.9306
925922	AC1-068 E	5.5793	50/50	5.5793
925931	AC1-069 C	11.9306	50/50	11.9306
925932	AC1-069 E	5.5793	50/50	5.5793
925981	AC1-074 C O1	3.9508	Adder	4.65
925982	AC1-074 E O1	1.6932	Adder	1.99
926011	AC1-078 C O1	11.5315	50/50	11.5315
926012	AC1-078 E O1	19.2192	50/50	19.2192
926061	AC1-085 C	23.0888	50/50	23.0888
926062	AC1-085 E	37.6712	50/50	37.6712
926101	**AC1-089 C O1 (Suspended)**	**4.0911**	**Adder**	**4.81**
926102	**AC1-089 E O1 (Suspended)**	**6.6750**	**Adder**	**7.85**
926791	AC1-165 C	11.7902	50/50	11.7902
926792	AC1-165 E	5.7197	50/50	5.7197
926801	AC1-166 C	11.7902	50/50	11.7902
926802	AC1-166 E	5.7197	50/50	5.7197
930062	AB1-014 E	7.7700	Adder	9.14
932381	AC2-055 C	1.8060	Adder	2.12
932382	AC2-055 E	2.9466	Adder	3.47
932421	AC2-060 C	6.4034	Adder	7.53
932422	AC2-060 E	3.6019	Adder	4.24
932431	AC2-061 C	4.1617	Adder	4.9
932432	AC2-061 E	4.2190	Adder	4.96
932462	AC2-066 E	4.6620	Adder	5.48
932481	AC2-068 C	3.0082	Adder	3.54
932482	AC2-068 E	4.9267	Adder	5.8
932551	AC2-075 C	0.9383	Adder	1.1
932552	AC2-075 E	0.4727	Adder	0.56
932661	AC2-088 C O1	3.9008	Adder	4.59
932662	AC2-088 E O1	3.2100	Adder	3.78

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934491	AD1-073 C	1.3207	Adder	1.55
934492	AD1-073 E	0.6804	Adder	0.8
934561	AD1-081 C	2.3063	50/50	2.3063
934562	AD1-081 E	1.1881	50/50	1.1881
935031	AD1-136 C	0.5486	Adder	0.65
935032	AD1-136 E	0.4673	Adder	0.55
935041	AD1-140 C O1	11.5761	Adder	13.62
935042	AD1-140 E O1	9.5702	Adder	11.26
936251	AD2-031 C O1	2.3259	Adder	2.74
936252	AD2-031 E O1	3.7949	Adder	4.46
936381	AD2-048 C	3.2506	Adder	3.82
936382	AD2-048 E	1.6218	Adder	1.91
938051	AE1-007 C	0.8627	Adder	1.01
938052	AE1-007 E	1.4076	Adder	1.66
938271	AE1-040 C O1	3.9390	Adder	4.63
938272	AE1-040 E O1	1.9820	Adder	2.33
938921	AE1-120	4.4113	Adder	5.19
939141	AE1-144 C O1	6.6759	Adder	7.85
939142	AE1-144 E O1	3.3130	Adder	3.9
940531	AE2-038 C O1	4.4534	Adder	5.24
940532	AE2-038 E O1	2.2059	Adder	2.6
941411	AE2-138 C	13.7018	Adder	16.12
941412	AE2-138 E	5.0678	Adder	5.96
941511	AE2-148 C	176.5482	50/50	176.5482
941512	AE2-148 E	79.8533	50/50	79.8533
941981	AE2-210 C O1	4.7213	Adder	5.55
941982	AE2-210 E O1	1.7759	Adder	2.09
942021	AE2-214 C	61.3896	50/50	61.3896
942022	AE2-214 E	40.9264	50/50	40.9264
942051	AE2-217 C	11.5218	Adder	13.56
942052	AE2-217 E	7.6812	Adder	9.04
942061	AE2-218 C	10.3282	Adder	12.15
942062	AE2-218 E	7.0154	Adder	8.25
942091	AE2-221 C	29.0250	50/50	29.0250
942092	AE2-221 E	19.3500	50/50	19.3500
942521	AE2-267 C O1	2.6220	Adder	3.08
942522	AE2-267 E O1	1.6207	Adder	1.91
942621	AE2-278 C	7.2621	Adder	8.54
942622	AE2-278 E	4.8441	Adder	5.7
942951	AE2-315	2.9457	Adder	3.47
942981	AE2-320 C O1	23.4752	50/50	23.4752
942982	AE2-320 E O1	11.6148	50/50	11.6148
943111	AE2-339 C	1.7787	Adder	2.09
943112	AE2-339 E	0.8761	Adder	1.03
943191	AE2-319 C O1	23.4752	50/50	23.4752
943192	AE2-319 E O1	11.6148	50/50	11.6148
943201	AE2-318 C	6.3843	Adder	7.51
943202	AE2-318 E	3.1161	Adder	3.67
943771	AF1-045	2.9736	Adder	3.5
943773	AF1-045 E	1.9856	Adder	2.34
943943	AF1-062 BAT	20.0600	Merchant Transmission	20.0600
944521	AF1-117 C	50.0090	50/50	50.0090

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944522	AF1-117 E	15.4050	50/50	15.4050
944621	AF1-127 C O1	3.8120	Adder	4.48
944622	AF1-127 E O1	1.8776	Adder	2.21
944941	AF1-159	1.3466	Adder	1.58
945631	AF1-228 C	43.6402	50/50	43.6402
945632	AF1-228 E	29.0935	50/50	29.0935
945681	AF1-233 C	12.6640	Adder	14.9
945682	AF1-233 E	6.2563	Adder	7.36
945841	AF1-249 C	1.1708	Adder	1.38
945842	AF1-249 E	0.4349	Adder	0.51
945861	AF1-251 C	9.4618	Adder	11.13
945862	AF1-251 E	6.3079	Adder	7.42
945911	AF1-256 C	4.0543	Adder	4.77
945912	AF1-256 E	2.7029	Adder	3.18
946101	AF1-275	25.5790	50/50	25.5790
946171	AF1-282 C	9.1140	50/50	9.1140
946172	AF1-282 E	6.0760	50/50	6.0760
946181	AF1-283 C	11.8482	50/50	11.8482
946182	AF1-283 E	7.8988	50/50	7.8988
946511	AF1-315 C O1	3.4434	Adder	4.05
946512	AF1-315 E O1	2.2956	Adder	2.7
957171	AF2-011 O1	1.2949	Adder	2.87
957181	AF2-012 O1	6.7336	Adder	14.95
957391	AF2-033 C	0.4705	Adder	1.04
957392	AF2-033 E	0.7058	Adder	1.57
957401	AF2-034 C	0.3961	Adder	0.88
957402	AF2-034 E	0.3375	Adder	0.75
957721	AF2-066 C O1	2.7039	Adder	6.0
957722	AF2-066 E O1	1.8026	Adder	4.0
957731	AF2-067 C O1	1.3733	Adder	3.05
957732	AF2-067 E O1	0.9156	Adder	2.03
957851	AF2-079 C O1	5.2164	Adder	11.58
957852	AF2-079 E O1	3.4776	Adder	7.72
958171	AF2-111 C	7.2454	Adder	16.08
958172	AF2-111 E	4.8303	Adder	10.72
958291	AF2-123 C O1	1.2539	Adder	2.78
958292	AF2-123 E O1	1.7286	Adder	3.84
959073	AF2-198 BAT	1.2041	Merchant Transmission	1.2041
959191	AF2-210 C	5.8320	Adder	12.95
959192	AF2-210 E	3.8880	Adder	8.63
959211	AF2-212 C O1	3.2740	Adder	7.27
959212	AF2-212 E O1	2.1827	Adder	4.85
959271	AF2-218 C O1	1.5068	Adder	3.34
959272	AF2-218 E O1	1.0049	Adder	2.23
959541	AF2-245 C	3.7663	Adder	8.36
959542	AF2-245 E	2.5109	Adder	5.57
959721	AF2-263 C	2.1390	Adder	4.75
959722	AF2-263 E	1.4260	Adder	3.17
960071	AF2-298 C O1	1.8260	Adder	4.05
960072	AF2-298 E O1	1.2214	Adder	2.71
960571	AF2-348 C	7.1467	Adder	15.86
960572	AF2-348 E	4.7645	Adder	10.58

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960801	AF2-371 C	1.7864	Adder	3.97
960802	AF2-371 E	1.1910	Adder	2.64
961491	AF2-440 C	1.4273	Adder	3.17
961492	AF2-440 E	1.4273	Adder	3.17
WEC	WEC	0.7264	Confirmed LTF	0.7264
LGEE	LGEE	3.1229	Confirmed LTF	3.1229
CPLE	CPLE	0.2269	Confirmed LTF	0.2269
CBM-W2	CBM-W2	23.5463	Confirmed LTF	23.5463
NY	NY	0.9069	Confirmed LTF	0.9069
CBM-W1	CBM-W1	22.5555	Confirmed LTF	22.5555
TVA	TVA	3.4328	Confirmed LTF	3.4328
O-066	O-066	10.7520	Confirmed LTF	10.7520
CBM-S2	CBM-S2	4.3986	Confirmed LTF	4.3986
CBM-S1	CBM-S1	25.6708	Confirmed LTF	25.6708
G-007	G-007	1.6588	Confirmed LTF	1.6588
MEC	MEC	3.9820	Confirmed LTF	3.9820

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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
9517258 2	24345 3	05BEATT Y	AEP	24402 2	05COL E	AEP	1	AEP_P4_#3195_05BEATT Y 345_304E	breake r	1203. 0	108.62	109.08	DC	12.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
247964	Y1-063 BAT	0.3052	Merchant Transmission	0.3052
250164	08BKJDB1	0.1226	Adder	0.14
250165	08BKJDB2	0.1226	Adder	0.14
251827	WILLYESP	0.3878	Adder	0.46
251828	CLNTESP1	0.4057	Adder	0.48
251829	CLNTESP2	0.2704	Adder	0.32
253110	09ADKINS	31.2953	50/50	31.2953
253261	09MON D	0.2539	50/50	0.2539
904722	V4-073 E	0.1614	Adder	0.19
913222	Y1-054 E	1.2706	Adder	1.49
918802	AA1-099 E	0.2704	Adder	0.32
923522	AB1-169 C OP	110.0869	Adder	129.51
925921	AC1-068 C	10.4948	50/50	10.4948
925922	AC1-068 E	4.9079	50/50	4.9079
925931	AC1-069 C	10.4948	50/50	10.4948
925932	AC1-069 E	4.9079	50/50	4.9079
925981	AC1-074 C O1	3.4524	Adder	4.06
925982	AC1-074 E O1	1.4796	Adder	1.74
926011	AC1-078 C O1	4.7724	Adder	5.61
926012	AC1-078 E O1	7.9540	Adder	9.36
926061	AC1-085 C	20.0503	50/50	20.0503
926062	AC1-085 E	32.7137	50/50	32.7137
926101	**AC1-089 C O1 (Suspended)**	**3.6749**	**Adder**	**4.32**
926102	**AC1-089 E O1 (Suspended)**	**5.9959**	**Adder**	**7.05**
926791	AC1-165 C	10.3713	50/50	10.3713
926792	AC1-165 E	5.0313	50/50	5.0313
926801	AC1-166 C	10.3713	50/50	10.3713
926802	AC1-166 E	5.0313	50/50	5.0313
930062	AB1-014 E	6.7785	Adder	7.97
932381	AC2-055 C	1.7406	Adder	2.05
932382	AC2-055 E	2.8399	Adder	3.34
932421	AC2-060 C	6.1717	Adder	7.26
932422	AC2-060 E	3.4716	Adder	4.08
932431	AC2-061 C	3.7370	Adder	4.4
932432	AC2-061 E	3.7884	Adder	4.46
932462	AC2-066 E	4.0671	Adder	4.78
932481	AC2-068 C	2.4618	Adder	2.9
932482	AC2-068 E	4.0317	Adder	4.74
932551	AC2-075 C	0.8200	Adder	0.96
932552	AC2-075 E	0.4131	Adder	0.49

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
932661	AC2-088 C O1	3.4275	Adder	4.03
932662	AC2-088 E O1	2.8206	Adder	3.32
932841	AC2-111 C O1	1.6279	Adder	1.92
932842	AC2-111 E O1	2.6561	Adder	3.12
934491	AD1-073 C	1.2729	Adder	1.5
934492	AD1-073 E	0.6557	Adder	0.77
934561	AD1-081 C	0.9545	Adder	1.12
934562	AD1-081 E	0.4917	Adder	0.58
935031	AD1-136 C	0.4820	Adder	0.57
935032	AD1-136 E	0.4106	Adder	0.48
935041	AD1-140 C O1	8.4174	Adder	9.9
935042	AD1-140 E O1	6.9589	Adder	8.19
936251	AD2-031 C O1	2.3927	50/50	2.3927
936252	AD2-031 E O1	3.9038	50/50	3.9038
936381	AD2-048 C	2.8441	Adder	3.35
936382	AD2-048 E	1.4190	Adder	1.67
938051	AE1-007 C	0.7060	Adder	0.83
938052	AE1-007 E	1.1519	Adder	1.36
938271	AE1-040 C O1	4.3159	50/50	4.3159
938272	AE1-040 E O1	2.1716	50/50	2.1716
938921	AE1-120	3.8485	Adder	4.53
939141	AE1-144 C O1	5.8953	Adder	6.94
939142	AE1-144 E O1	2.9256	Adder	3.44
940531	AE2-038 C O1	3.9327	Adder	4.63
940532	AE2-038 E O1	1.9480	Adder	2.29
941411	AE2-138 C	12.0013	Adder	14.12
941412	AE2-138 E	4.4389	Adder	5.22
941511	AE2-148 C	154.5298	50/50	154.5298
941512	AE2-148 E	69.8943	50/50	69.8943
941981	AE2-210 C O1	4.1353	Adder	4.87
941982	AE2-210 E O1	1.5555	Adder	1.83
942061	AE2-218 C	8.0099	Adder	9.42
942062	AE2-218 E	5.4407	Adder	6.4
942091	AE2-221 C	24.9786	50/50	24.9786
942092	AE2-221 E	16.6524	50/50	16.6524
942521	AE2-267 C O1	2.2359	Adder	2.63
942522	AE2-267 E O1	1.3821	Adder	1.63
942951	AE2-315	2.4471	Adder	2.88
942981	AE2-320 C O1	20.6500	50/50	20.6500
942982	AE2-320 E O1	10.2170	50/50	10.2170
943111	AE2-339 C	1.5527	Adder	1.83
943112	AE2-339 E	0.7648	Adder	0.9
943191	AE2-319 C O1	20.6500	50/50	20.6500
943192	AE2-319 E O1	10.2170	50/50	10.2170
943201	AE2-318 C	5.5475	Adder	6.53
943202	AE2-318 E	2.7077	Adder	3.19
943771	AF1-045	2.5839	Adder	3.04
943773	AF1-045 E	1.7253	Adder	2.03
944031	AF1-071 C	0.4070	Adder	0.48
944032	AF1-071 E	0.6640	Adder	0.78
944521	AF1-117 C	44.0077	50/50	44.0077
944522	AF1-117 E	13.5563	50/50	13.5563

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944621	AF1-127 C O1	3.3373	Adder	3.93
944622	AF1-127 E O1	1.6437	Adder	1.93
944941	AF1-159	1.3852	50/50	1.3852
945631	AF1-228 C	38.2453	50/50	38.2453
945632	AF1-228 E	25.4969	50/50	25.4969
945681	AF1-233 C	11.1855	Adder	13.16
945682	AF1-233 E	5.5259	Adder	6.5
945841	AF1-249 C	1.0038	Adder	1.18
945842	AF1-249 E	0.3728	Adder	0.44
945861	AF1-251 C	8.2860	Adder	9.75
945862	AF1-251 E	5.5240	Adder	6.5
945911	AF1-256 C	3.5810	Adder	4.21
945912	AF1-256 E	2.3873	Adder	2.81
946102	AF1-275 BAT	18.6570	50/50	18.6570
946171	AF1-282 C	7.9146	50/50	7.9146
946172	AF1-282 E	5.2764	50/50	5.2764
946181	AF1-283 C	10.2890	50/50	10.2890
946182	AF1-283 E	6.8593	50/50	6.8593
946511	AF1-315 C O1	2.9945	Adder	3.52
946512	AF1-315 E O1	1.9963	Adder	2.35
957171	AF2-011 O1	1.0647	Adder	2.36
957181	AF2-012 O1	5.5365	Adder	12.29
957391	AF2-033 C	0.3768	Adder	0.84
957392	AF2-033 E	0.5651	Adder	1.25
957401	AF2-034 C	0.3359	Adder	0.75
957402	AF2-034 E	0.2861	Adder	0.64
957721	AF2-066 C O1	2.1771	Adder	4.83
957722	AF2-066 E O1	1.4514	Adder	3.22
957731	AF2-067 C O1	1.1092	Adder	2.46
957732	AF2-067 E O1	0.7395	Adder	1.64
957851	AF2-079 C O1	4.1272	Adder	9.16
957852	AF2-079 E O1	2.7515	Adder	6.11
958171	AF2-111 C	6.3852	Adder	14.17
958172	AF2-111 E	4.2568	Adder	9.45
959191	AF2-210 C	4.9887	Adder	11.07
959192	AF2-210 E	3.3258	Adder	7.38
959201	AF2-211 C	1.7029	Adder	3.78
959202	AF2-211 E	1.1353	Adder	2.52
959271	AF2-218 C O1	1.1765	Adder	2.61
959272	AF2-218 E O1	0.7846	Adder	1.74
959541	AF2-245 C	3.3243	Adder	7.38
959542	AF2-245 E	2.2162	Adder	4.92
960071	AF2-298 C O1	1.4929	Adder	3.31
960072	AF2-298 E O1	0.9986	Adder	2.22
960151	AF2-306	0.7563	Adder	1.68
960161	AF2-307 C	1.1519	Adder	2.56
960162	AF2-307 E	0.7679	Adder	1.7
960571	AF2-348 C	6.2960	Adder	13.98
960572	AF2-348 E	4.1973	Adder	9.32
961491	AF2-440 C	1.2678	Adder	2.81
961492	AF2-440 E	1.2678	Adder	2.81
WEC	WEC	0.4237	Confirmed LTF	0.4237

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
LGEE	LGEE	2.6306	Confirmed LTF	2.6306
CPLE	CPLE	0.2739	Confirmed LTF	0.2739
CBM-W2	CBM-W2	18.1490	Confirmed LTF	18.1490
NY	NY	0.6890	Confirmed LTF	0.6890
CBM-W1	CBM-W1	11.8845	Confirmed LTF	11.8845
TVA	TVA	2.8350	Confirmed LTF	2.8350
O-066	O-066	8.1514	Confirmed LTF	8.1514
CBM-S2	CBM-S2	4.3350	Confirmed LTF	4.3350
CBM-S1	CBM-S1	21.3426	Confirmed LTF	21.3426
G-007	G-007	1.2574	Confirmed LTF	1.2574
MEC	MEC	2.6457	Confirmed LTF	2.6457

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14.7 Queue Dependancies

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
AA1-099	Clinton Co. 34.5kV	In Service
AB1-014	Hillcrest 138kV	Under Construction
AB1-169	Stuart 345kV	Engineering and Procurement
AB2-083	Delano 138kV	Active
AB2-085	Adams 138kV	Active
AC1-001	Delano 138kV	Active
AC1-068	Atlanta 69kV I	Engineering and Procurement
AC1-069	Atlanta 69kV II	Engineering and Procurement
AC1-074	Jacksonville-Renaker 138kV I	Active
AC1-078	Beatty-London 138kV	Active
AC1-085	Stuart-Clinton 345kV	Engineering and Procurement
AC1-089	Hillsboro-Wildcat 138kV	Suspended
AC1-165	Atlanta 69kV III	Engineering and Procurement
AC1-166	Atlanta 69kV IV	Engineering and Procurement
AC1-194	Elk 138kV	Active
AC2-029	Circleville 138kV	Active
AC2-055	Buckskin 69kV	Active
AC2-059	Biers Run-Circleville 138kV	Active
AC2-060	Buckskin 69kV	Active
AC2-061	Hillsboro-Clinton 138kV	Active
AC2-066	Hillcrest 138kV	Under Construction
AC2-068	Camden-Crystal II 69kV	Engineering and Procurement
AC2-075	Great Blue Heron Solar	Active
AC2-088	S. Bethel-Brown 69kV	Engineering and Procurement
AC2-111	College Corner 138kV	Active
AD1-072	Biers Run-Circleville 138 kV	Active
AD1-073	Buckskin 69 kV	Active
AD1-081	Beatty-London 138 kV	Active
AD1-136	South Bethel-Brown 69 kV	Engineering and Procurement
AD1-140	Greene-Clark 138 kV	Active
AD2-016	Biers Run-Circleville 138 kV	Active
AD2-031	Martinsville-Wilmington 69 kV	Active
AD2-048	Cynthia-Headquarters 69 kV	Active
AD2-162	Biers Run-Circleville 138kV	Active
AE1-007	Camden-Crystal III 69 kV	Active
AE1-040	Greenfield 69 kV	Active
AE1-093	Elk 138 kV	Active
AE1-120	Hillcrest 138 kV	Engineering and Procurement
AE1-144	Goddard-Plumville 138 kV	Active
AE2-038	Goddard-Plumsville 138 kV II	Active

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Queue Number	Project Name	Status
AE2-138	Avon-North Clark 345 kV	Active
AE2-148	Beatty-Greene 345 kV	Active
AE2-149	Biers Run-Bixby 345 kV	Active
AE2-210	Avon-North Clark 345 kV	Active
AE2-214	Cole 345 kV	Active
AE2-217	East Springfield-London 138 kV	Active
AE2-218	Eldean 138 kV	Active
AE2-221	Clinton-Stuart 345 kV	Active
AE2-267	Woodsdale 345 kV	Active
AE2-275	JK Smith-Fawkes 138 kV	Active
AE2-278	Urbana 138 kV	Active
AE2-302	East Beaver-Lick 138 kV	Active
AE2-308	Three Forks-Dale 138 kV	Active
AE2-315	Yankee Tap 69 kV	Active
AE2-318	Ford-Cedarville 138 kV	Active
AE2-319	Atlanta 69kV I	Active
AE2-320	Atlanta 69 kV II	Active
AE2-339	Avon 138 kV	Active
AF1-045	Cedarville-Ford 138 kV	Active
AF1-062	Jug Street 138 kV	Active
AF1-071	College Corner 138 kV	Active
AF1-117	Atlanta-Stuart 345 kV	Active
AF1-127	Avon 345 kV	Active
AF1-159	Martinsville-Wilmington 69 kV	Active
AF1-228	Beatty-Greene 345 kV	Active
AF1-233	Flemingsburg 138 kV	Active
AF1-249	Nickel 12.47 kV	Active
AF1-251	Avon-North Clark 345 kV	Active
AF1-256	Flemingsburg-Spurlock 138 kV	Active
AF1-267	Union City Tap 138 kV	Active
AF1-275	Cole 345 kV	Active
AF1-282	Stuart-Clinton 345 kV	Active
AF1-283	Stuart-Clinton 345 kV	Active
AF1-315	Cedarville-Ford 138 kV	Active
AF2-011	Tait 69 kV	Active
AF2-012	Tait 69 kV	Active
AF2-033	Miami Fort 138 kV	Active
AF2-034	Kendall	Active
AF2-066	West Manchester 69 kV	Active
AF2-067	West Manchester-Crown 69 kV	Active
AF2-079	Greenville 138 kV	Active
AF2-111	North Clark-Spurlock 345 kV	Active
AF2-123	Lafayette 69 kV	Active
AF2-198	Heath 69 kV	Active
AF2-210	Foster-Garver Road 345 kV	Active
AF2-211	College Corner 138 kV	Active
AF2-212	Shelby 138 kV	Active
AF2-218	Gettysburg 69 kV	Active
AF2-245	Spurlock-Flemingsburg 345 kV	Active
AF2-263	Shelby 138 kV	Active
AF2-298	Crown-Brookville 69 kV	Active
AF2-306	Hope-Blevins Valley Tap 69 kV	Active

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Queue Number	Project Name	Status
AF2-307	Hope-Blevins Valley Tap 69 kV	Active
AF2-348	North Clark-Spurlock 345 kV	Active
AF2-355	West Gerrard-J.K. Smith 345 nkV	Active
AF2-371	Harrison-Poston 138 kV	Active
AF2-440	Martinsville-Highland 69 kV	Active
V4-073	Yankee 12.5kV	In Service
Y1-054	Rochelle 138kV	In Service
Y1-063	Trenton 34.5kV	In Service

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14.8 Contingency Descriptions – Primary POI

Contingency Name	Contingency Definition
AEP_P4_#10715_05COLE 345_C	CONTINGENCY 'AEP_P4_#10715_05COLE 345_C' OPEN BRANCH FROM BUS 244022 TO BUS 243457 CKT 1 / 244022 05COLE 345 243457 05HAYDEN 345 1 OPEN BRANCH FROM BUS 244022 TO BUS 244023 CKT 1 / 244022 05COLE 345 244023 05COLE 138 1 END
AEP_P1-2_#10137	CONTINGENCY 'AEP_P1-2_#10137' OPEN BRANCH FROM BUS 243453 TO BUS 244022 CKT 1 / 243453 05BEATTY 345 244022 05COLE 345 1 END
DAY_P1-2_#762	CONTINGENCY 'DAY_P1-2_#762' OPEN BRANCH FROM BUS 243453 TO BUS 253110 CKT 1 / 243453 05BEATTY 345 253110 09ADKINS 345 1 END
AEP_P4_#3196_05BEATTY 345_302E	CONTINGENCY 'AEP_P4_#3196_05BEATTY 345_302E' OPEN BRANCH FROM BUS 243453 TO BUS 244022 CKT 1 / 243453 05BEATTY 345 244022 05COLE 345 1 OPEN BRANCH FROM BUS 243453 TO BUS 243468 CKT 4 / 243453 05BEATTY 345 243468 05BEATTX 138 4 END
AEP_P4_#3195_05BEATTY 345_304E	CONTINGENCY 'AEP_P4_#3195_05BEATTY 345_304E' OPEN BRANCH FROM BUS 243453 TO BUS 243454 CKT 1 / 243453 05BEATTY 345 243454 05BIXBY 345 1 OPEN BRANCH FROM BUS 243453 TO BUS 243468 CKT 4 / 243453 05BEATTY 345 243468 05BEATTX 138 4 END

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15 Light Load Analysis

Light Load Studies (As applicable)

To be determined during later study phases.

16 Short Circuit Analysis

The following Breakers are overdutied:

To be determined during later study phases.

17 Stability and Reactive Power Assessment

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

To be determined during later study phases.

18 Affected Systems

18.1 MISO

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

18.2 LG&E

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

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19 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AF2-012 was evaluated as a 104.0 MW (Capacity 104.0 MW) injection as an uprate to Tait Generation at the Tait 69 kV substation in the Dayton area. Project AF2-012 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-012 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

19.1 Generation Deliverability

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

None

19.2 Multiple Facility Contingency

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

None

19.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95172528	243453	05BEATTY	345.0	AEP	243454	05BIXBY	345.0	AEP	1	AEP_P4_#3196_05BEATTY 345_302E	breaker	1203.0	121.29	121.87	DC	15.43
95172529	243453	05BEATTY	345.0	AEP	243454	05BIXBY	345.0	AEP	1	AEP_P4_#10715_05COLE 345_C	breaker	1203.0	120.79	121.36	DC	14.96
95172582	243453	05BEATTY	345.0	AEP	244022	05COLE	345.0	AEP	1	AEP_P4_#3195_05BEATTY 345_304E	breaker	1203.0	108.62	109.08	DC	12.29

19.4 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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95172823	243453	05BEATTY	345.0	AEP	243454	05BIXBY	345.0	AEP	1	AEP_P1-2_#10137	operation	1203.0	113.41	113.98	DC	14.96
95172878	945630	AF1-228 TAP	345.0	DAY	243453	05BEATTY	345.0	AEP	1	DAY_P1-2_#762	operation	1374.0	105.25	105.86	DC	18.69

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19.5 Flow Gate Details – Secondary POI

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

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19.5.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95172529	243453	05BEATTY	AEP	243454	05BIXBY	AEP	1	AEP_P4_#10715_05COLE 345_C	breaker	1203.0	120.79	121.36	DC	14.96

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
250164	08BKJDB1	0.1416	Adder	0.17
250165	08BKJDB2	0.1416	Adder	0.17
251827	WILLYESP	0.4544	Adder	0.53
251828	CLNTESP1	0.4610	Adder	0.54
251829	CLNTESP2	0.3073	Adder	0.36
253110	09ADKINS	35.6143	50/50	35.6143
904722	V4-073 E	0.1943	Adder	0.23
913222	Y1-054 E	1.4812	Adder	1.74
918802	AA1-099 E	0.3073	Adder	0.36
923522	AB1-169 C OP	123.9529	Adder	145.83
925921	AC1-068 C	11.9306	50/50	11.9306
925922	AC1-068 E	5.5793	50/50	5.5793
925931	AC1-069 C	11.9306	50/50	11.9306
925932	AC1-069 E	5.5793	50/50	5.5793
925981	AC1-074 C O1	3.9508	Adder	4.65
925982	AC1-074 E O1	1.6932	Adder	1.99
926011	AC1-078 C O1	11.5315	50/50	11.5315
926012	AC1-078 E O1	19.2192	50/50	19.2192
926061	AC1-085 C	23.0888	50/50	23.0888
926062	AC1-085 E	37.6712	50/50	37.6712
926101	**AC1-089 C O1 (Suspended)**	**4.0911**	**Adder**	**4.81**
926102	**AC1-089 E O1 (Suspended)**	**6.6750**	**Adder**	**7.85**
926791	AC1-165 C	11.7902	50/50	11.7902
926792	AC1-165 E	5.7197	50/50	5.7197
926801	AC1-166 C	11.7902	50/50	11.7902
926802	AC1-166 E	5.7197	50/50	5.7197
930062	AB1-014 E	7.7700	Adder	9.14
932381	AC2-055 C	1.8060	Adder	2.12
932382	AC2-055 E	2.9466	Adder	3.47
932421	AC2-060 C	6.4034	Adder	7.53
932422	AC2-060 E	3.6019	Adder	4.24
932431	AC2-061 C	4.1617	Adder	4.9
932432	AC2-061 E	4.2190	Adder	4.96
932462	AC2-066 E	4.6620	Adder	5.48
932481	AC2-068 C	3.0082	Adder	3.54
932482	AC2-068 E	4.9267	Adder	5.8
932551	AC2-075 C	0.9383	Adder	1.1
932552	AC2-075 E	0.4727	Adder	0.56
932661	AC2-088 C O1	3.9008	Adder	4.59
932662	AC2-088 E O1	3.2100	Adder	3.78

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934491	AD1-073 C	1.3207	Adder	1.55
934492	AD1-073 E	0.6804	Adder	0.8
934561	AD1-081 C	2.3063	50/50	2.3063
934562	AD1-081 E	1.1881	50/50	1.1881
935031	AD1-136 C	0.5486	Adder	0.65
935032	AD1-136 E	0.4673	Adder	0.55
935041	AD1-140 C O1	11.5761	Adder	13.62
935042	AD1-140 E O1	9.5702	Adder	11.26
936251	AD2-031 C O1	2.3259	Adder	2.74
936252	AD2-031 E O1	3.7949	Adder	4.46
936381	AD2-048 C	3.2506	Adder	3.82
936382	AD2-048 E	1.6218	Adder	1.91
938051	AE1-007 C	0.8627	Adder	1.01
938052	AE1-007 E	1.4076	Adder	1.66
938271	AE1-040 C O1	3.9390	Adder	4.63
938272	AE1-040 E O1	1.9820	Adder	2.33
938921	AE1-120	4.4113	Adder	5.19
939141	AE1-144 C O1	6.6759	Adder	7.85
939142	AE1-144 E O1	3.3130	Adder	3.9
940531	AE2-038 C O1	4.4534	Adder	5.24
940532	AE2-038 E O1	2.2059	Adder	2.6
941411	AE2-138 C	13.7034	Adder	16.12
941412	AE2-138 E	5.0684	Adder	5.96
941511	AE2-148 C	176.5482	50/50	176.5482
941512	AE2-148 E	79.8533	50/50	79.8533
941981	AE2-210 C O1	4.7218	Adder	5.56
941982	AE2-210 E O1	1.7761	Adder	2.09
942021	AE2-214 C	61.3896	50/50	61.3896
942022	AE2-214 E	40.9264	50/50	40.9264
942051	AE2-217 C	11.5218	Adder	13.56
942052	AE2-217 E	7.6812	Adder	9.04
942061	AE2-218 C	10.3282	Adder	12.15
942062	AE2-218 E	7.0154	Adder	8.25
942091	AE2-221 C	29.0250	50/50	29.0250
942092	AE2-221 E	19.3500	50/50	19.3500
942521	AE2-267 C O1	2.6220	Adder	3.08
942522	AE2-267 E O1	1.6207	Adder	1.91
942621	AE2-278 C	7.2621	Adder	8.54
942622	AE2-278 E	4.8441	Adder	5.7
942951	AE2-315	2.9457	Adder	3.47
942981	AE2-320 C O1	23.4752	50/50	23.4752
942982	AE2-320 E O1	11.6148	50/50	11.6148
943111	AE2-339 C	1.7787	Adder	2.09
943112	AE2-339 E	0.8761	Adder	1.03
943191	AE2-319 C O1	23.4752	50/50	23.4752
943192	AE2-319 E O1	11.6148	50/50	11.6148
943201	AE2-318 C	6.3843	Adder	7.51
943202	AE2-318 E	3.1161	Adder	3.67
943771	AF1-045	2.9736	Adder	3.5
943773	AF1-045 E	1.9856	Adder	2.34
943943	AF1-062 BAT	20.0600	Merchant Transmission	20.0600
944521	AF1-117 C	50.0090	50/50	50.0090

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944522	AF1-117 E	15.4050	50/50	15.4050
944621	AF1-127 C O1	3.8120	Adder	4.48
944622	AF1-127 E O1	1.8776	Adder	2.21
944941	AF1-159	1.3466	Adder	1.58
945631	AF1-228 C	43.6402	50/50	43.6402
945632	AF1-228 E	29.0935	50/50	29.0935
945681	AF1-233 C	12.6640	Adder	14.9
945682	AF1-233 E	6.2563	Adder	7.36
945841	AF1-249 C	1.1708	Adder	1.38
945842	AF1-249 E	0.4349	Adder	0.51
945861	AF1-251 C	9.4629	Adder	11.13
945862	AF1-251 E	6.3086	Adder	7.42
945911	AF1-256 C	4.0543	Adder	4.77
945912	AF1-256 E	2.7029	Adder	3.18
946101	AF1-275	25.5790	50/50	25.5790
946171	AF1-282 C	9.1140	50/50	9.1140
946172	AF1-282 E	6.0760	50/50	6.0760
946181	AF1-283 C	11.8482	50/50	11.8482
946182	AF1-283 E	7.8988	50/50	7.8988
946511	AF1-315 C O1	3.4434	Adder	4.05
946512	AF1-315 E O1	2.2956	Adder	2.7
957171	AF2-011 O2	1.2957	Adder	2.88
957181	AF2-012 O2	6.7378	Adder	14.96
957391	AF2-033 C	0.4705	Adder	1.04
957392	AF2-033 E	0.7058	Adder	1.57
957401	AF2-034 C	0.3961	Adder	0.88
957402	AF2-034 E	0.3375	Adder	0.75
957721	AF2-066 C O2	2.7467	Adder	6.1
957722	AF2-066 E O2	1.8311	Adder	4.06
957731	AF2-067 C O2	1.3519	Adder	3.0
957732	AF2-067 E O2	0.9013	Adder	2.0
957851	AF2-079 C O2	5.2427	Adder	11.64
957852	AF2-079 E O2	3.4951	Adder	7.76
958171	AF2-111 C O2	7.1332	Adder	15.83
958172	AF2-111 E O2	4.7555	Adder	10.56
958291	AF2-123 C O2	0.8588	Adder	1.91
958292	AF2-123 E O2	1.1840	Adder	2.63
959073	AF2-198 BAT	1.1214	Merchant Transmission	1.1214
959191	AF2-210 C	5.8320	Adder	12.95
959192	AF2-210 E	3.8880	Adder	8.63
959211	AF2-212 C O2	3.2744	Adder	7.27
959212	AF2-212 E O2	2.1829	Adder	4.85
959271	AF2-218 C O2	1.5060	Adder	3.34
959272	AF2-218 E O2	1.0043	Adder	2.23
959541	AF2-245 C O2	3.7663	Adder	8.36
959542	AF2-245 E O2	2.5109	Adder	5.57
959721	AF2-263 C	2.1390	Adder	4.75
959722	AF2-263 E	1.4260	Adder	3.17
960071	AF2-298 C O2	1.8466	Adder	4.1
960072	AF2-298 E O2	1.2352	Adder	2.74
960571	AF2-348 C	7.1467	Adder	15.86
960572	AF2-348 E	4.7645	Adder	10.58

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960801	AF2-371 C	1.7864	Adder	3.97
960802	AF2-371 E	1.1910	Adder	2.64
961491	AF2-440 C O2	0.9823	Adder	2.18
961492	AF2-440 E O2	0.9823	Adder	2.18
WEC	WEC	0.7264	Confirmed LTF	0.7264
LGEE	LGEE	3.1229	Confirmed LTF	3.1229
CPLE	CPLE	0.2269	Confirmed LTF	0.2269
CBM-W2	CBM-W2	23.5463	Confirmed LTF	23.5463
NY	NY	0.9069	Confirmed LTF	0.9069
CBM-W1	CBM-W1	22.5555	Confirmed LTF	22.5555
TVA	TVA	3.4328	Confirmed LTF	3.4328
O-066	O-066	10.7520	Confirmed LTF	10.7520
CBM-S2	CBM-S2	4.3986	Confirmed LTF	4.3986
CBM-S1	CBM-S1	25.6708	Confirmed LTF	25.6708
G-007	G-007	1.6588	Confirmed LTF	1.6588
MEC	MEC	3.9820	Confirmed LTF	3.9820

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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
9517258 2	24345 3	05BEATTY	AEP	24402 2	05COLE	AEP	1	AEP_P4_#3195_05BEATTY 345_304E	breaker	1203.0	108.62	109.08	DC	12.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
247964	Y1-063 BAT	0.3052	Merchant Transmission	0.3052
250164	08BKJDB1	0.1226	Adder	0.14
250165	08BKJDB2	0.1226	Adder	0.14
251827	WILLYESP	0.3878	Adder	0.46
251828	CLNTESP1	0.4057	Adder	0.48
251829	CLNTESP2	0.2704	Adder	0.32
253110	09ADKINS	31.2953	50/50	31.2953
253261	09MON D	0.2539	50/50	0.2539
904722	V4-073 E	0.1614	Adder	0.19
913222	Y1-054 E	1.2706	Adder	1.49
918802	AA1-099 E	0.2704	Adder	0.32
923522	AB1-169 C OP	110.0869	Adder	129.51
925921	AC1-068 C	10.4948	50/50	10.4948
925922	AC1-068 E	4.9079	50/50	4.9079
925931	AC1-069 C	10.4948	50/50	10.4948
925932	AC1-069 E	4.9079	50/50	4.9079
925981	AC1-074 C O1	3.4524	Adder	4.06
925982	AC1-074 E O1	1.4796	Adder	1.74
926011	AC1-078 C O1	4.7724	Adder	5.61
926012	AC1-078 E O1	7.9540	Adder	9.36
926061	AC1-085 C	20.0503	50/50	20.0503
926062	AC1-085 E	32.7137	50/50	32.7137
926101	**AC1-089 C O1 (Suspended)**	**3.6749**	**Adder**	**4.32**
926102	**AC1-089 E O1 (Suspended)**	**5.9959**	**Adder**	**7.05**
926791	AC1-165 C	10.3713	50/50	10.3713
926792	AC1-165 E	5.0313	50/50	5.0313
926801	AC1-166 C	10.3713	50/50	10.3713
926802	AC1-166 E	5.0313	50/50	5.0313
930062	AB1-014 E	6.7785	Adder	7.97
932381	AC2-055 C	1.7406	Adder	2.05
932382	AC2-055 E	2.8399	Adder	3.34
932421	AC2-060 C	6.1717	Adder	7.26
932422	AC2-060 E	3.4716	Adder	4.08
932431	AC2-061 C	3.7370	Adder	4.4
932432	AC2-061 E	3.7884	Adder	4.46
932462	AC2-066 E	4.0671	Adder	4.78
932481	AC2-068 C	2.4618	Adder	2.9
932482	AC2-068 E	4.0317	Adder	4.74

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
932551	AC2-075 C	0.8200	Adder	0.96
932552	AC2-075 E	0.4131	Adder	0.49
932661	AC2-088 C O1	3.4275	Adder	4.03
932662	AC2-088 E O1	2.8206	Adder	3.32
932841	AC2-111 C O1	1.6279	Adder	1.92
932842	AC2-111 E O1	2.6561	Adder	3.12
934491	AD1-073 C	1.2729	Adder	1.5
934492	AD1-073 E	0.6557	Adder	0.77
934561	AD1-081 C	0.9545	Adder	1.12
934562	AD1-081 E	0.4917	Adder	0.58
935031	AD1-136 C	0.4820	Adder	0.57
935032	AD1-136 E	0.4106	Adder	0.48
935041	AD1-140 C O1	8.4174	Adder	9.9
935042	AD1-140 E O1	6.9589	Adder	8.19
936251	AD2-031 C O1	2.3927	50/50	2.3927
936252	AD2-031 E O1	3.9038	50/50	3.9038
936381	AD2-048 C	2.8441	Adder	3.35
936382	AD2-048 E	1.4190	Adder	1.67
938051	AE1-007 C	0.7060	Adder	0.83
938052	AE1-007 E	1.1519	Adder	1.36
938271	AE1-040 C O1	4.3159	50/50	4.3159
938272	AE1-040 E O1	2.1716	50/50	2.1716
938921	AE1-120	3.8485	Adder	4.53
939141	AE1-144 C O1	5.8953	Adder	6.94
939142	AE1-144 E O1	2.9256	Adder	3.44
940531	AE2-038 C O1	3.9327	Adder	4.63
940532	AE2-038 E O1	1.9480	Adder	2.29
941411	AE2-138 C	12.0013	Adder	14.12
941412	AE2-138 E	4.4389	Adder	5.22
941511	AE2-148 C	154.5298	50/50	154.5298
941512	AE2-148 E	69.8943	50/50	69.8943
941981	AE2-210 C O1	4.1353	Adder	4.87
941982	AE2-210 E O1	1.5555	Adder	1.83
942061	AE2-218 C	8.0099	Adder	9.42
942062	AE2-218 E	5.4407	Adder	6.4
942091	AE2-221 C	24.9786	50/50	24.9786
942092	AE2-221 E	16.6524	50/50	16.6524
942521	AE2-267 C O1	2.2359	Adder	2.63
942522	AE2-267 E O1	1.3821	Adder	1.63
942951	AE2-315	2.4471	Adder	2.88
942981	AE2-320 C O1	20.6500	50/50	20.6500
942982	AE2-320 E O1	10.2170	50/50	10.2170
943111	AE2-339 C	1.5527	Adder	1.83
943112	AE2-339 E	0.7648	Adder	0.9
943191	AE2-319 C O1	20.6500	50/50	20.6500
943192	AE2-319 E O1	10.2170	50/50	10.2170
943201	AE2-318 C	5.5475	Adder	6.53
943202	AE2-318 E	2.7077	Adder	3.19
943771	AF1-045	2.5839	Adder	3.04
943773	AF1-045 E	1.7253	Adder	2.03
944031	AF1-071 C	0.4070	Adder	0.48
944032	AF1-071 E	0.6640	Adder	0.78

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944521	AF1-117 C	44.0077	50/50	44.0077
944522	AF1-117 E	13.5563	50/50	13.5563
944621	AF1-127 C O1	3.3373	Adder	3.93
944622	AF1-127 E O1	1.6437	Adder	1.93
944941	AF1-159	1.3852	50/50	1.3852
945631	AF1-228 C	38.2453	50/50	38.2453
945632	AF1-228 E	25.4969	50/50	25.4969
945681	AF1-233 C	11.1855	Adder	13.16
945682	AF1-233 E	5.5259	Adder	6.5
945841	AF1-249 C	1.0038	Adder	1.18
945842	AF1-249 E	0.3728	Adder	0.44
945861	AF1-251 C	8.2860	Adder	9.75
945862	AF1-251 E	5.5240	Adder	6.5
945911	AF1-256 C	3.5810	Adder	4.21
945912	AF1-256 E	2.3873	Adder	2.81
946102	AF1-275 BAT	18.6570	50/50	18.6570
946171	AF1-282 C	7.9146	50/50	7.9146
946172	AF1-282 E	5.2764	50/50	5.2764
946181	AF1-283 C	10.2890	50/50	10.2890
946182	AF1-283 E	6.8593	50/50	6.8593
946511	AF1-315 C O1	2.9945	Adder	3.52
946512	AF1-315 E O1	1.9963	Adder	2.35
957171	AF2-011 O2	1.0646	Adder	2.36
957181	AF2-012 O2	5.5360	Adder	12.29
957391	AF2-033 C	0.3768	Adder	0.84
957392	AF2-033 E	0.5651	Adder	1.25
957401	AF2-034 C	0.3359	Adder	0.75
957402	AF2-034 E	0.2861	Adder	0.64
957721	AF2-066 C O2	2.2184	Adder	4.92
957722	AF2-066 E O2	1.4789	Adder	3.28
957731	AF2-067 C O2	1.0886	Adder	2.42
957732	AF2-067 E O2	0.7257	Adder	1.61
957851	AF2-079 C O2	4.1518	Adder	9.22
957852	AF2-079 E O2	2.7678	Adder	6.14
958171	AF2-111 C O2	6.2953	Adder	13.97
958172	AF2-111 E O2	4.1969	Adder	9.32
959191	AF2-210 C	4.9887	Adder	11.07
959192	AF2-210 E	3.3258	Adder	7.38
959201	AF2-211 C	1.7029	Adder	3.78
959202	AF2-211 E	1.1353	Adder	2.52
959271	AF2-218 C O2	1.1757	Adder	2.61
959272	AF2-218 E O2	0.7841	Adder	1.74
959541	AF2-245 C O2	3.3239	Adder	7.38
959542	AF2-245 E O2	2.2159	Adder	4.92
960071	AF2-298 C O2	1.5136	Adder	3.36
960072	AF2-298 E O2	1.0125	Adder	2.25
960151	AF2-306	0.7563	Adder	1.68
960161	AF2-307 C	1.1519	Adder	2.56
960162	AF2-307 E	0.7679	Adder	1.7
960571	AF2-348 C	6.2960	Adder	13.98
960572	AF2-348 E	4.1973	Adder	9.32
961491	AF2-440 C O2	0.8776	Adder	1.95

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961492	AF2-440 E O2	0.8776	Adder	1.95
WEC	WEC	0.4237	Confirmed LTF	0.4237
LGEE	LGEE	2.6306	Confirmed LTF	2.6306
CPLE	CPLE	0.2739	Confirmed LTF	0.2739
CBM-W2	CBM-W2	18.1490	Confirmed LTF	18.1490
NY	NY	0.6890	Confirmed LTF	0.6890
CBM-W1	CBM-W1	11.8845	Confirmed LTF	11.8845
TVA	TVA	2.8350	Confirmed LTF	2.8350
O-066	O-066	8.1514	Confirmed LTF	8.1514
CBM-S2	CBM-S2	4.3350	Confirmed LTF	4.3350
CBM-S1	CBM-S1	21.3426	Confirmed LTF	21.3426
G-007	G-007	1.2574	Confirmed LTF	1.2574
MEC	MEC	2.6457	Confirmed LTF	2.6457

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19.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
AEP_P4_#10715_05COLE 345_C	CONTINGENCY 'AEP_P4_#10715_05COLE 345_C' OPEN BRANCH FROM BUS 244022 TO BUS 243457 CKT 1 / 244022 05COLE 345 243457 05HAYDEN 345 1 OPEN BRANCH FROM BUS 244022 TO BUS 244023 CKT 1 / 244022 05COLE 345 244023 05COLE 138 1 END
AEP_P1-2_#10137	CONTINGENCY 'AEP_P1-2_#10137' OPEN BRANCH FROM BUS 243453 TO BUS 244022 CKT 1 / 243453 05BEATTY 345 244022 05COLE 345 1 END
DAY_P1-2_#762	CONTINGENCY 'DAY_P1-2_#762' OPEN BRANCH FROM BUS 243453 TO BUS 253110 CKT 1 / 243453 05BEATTY 345 253110 09ADKINS 345 1 END
AEP_P4_#3196_05BEATTY 345_302E	CONTINGENCY 'AEP_P4_#3196_05BEATTY 345_302E' OPEN BRANCH FROM BUS 243453 TO BUS 244022 CKT 1 / 243453 05BEATTY 345 244022 05COLE 345 1 OPEN BRANCH FROM BUS 243453 TO BUS 243468 CKT 4 / 243453 05BEATTY 345 243468 05BEATTX 138 4 END
AEP_P4_#3195_05BEATTY 345_304E	CONTINGENCY 'AEP_P4_#3195_05BEATTY 345_304E' OPEN BRANCH FROM BUS 243453 TO BUS 243454 CKT 1 / 243453 05BEATTY 345 243454 05BIXBY 345 1 OPEN BRANCH FROM BUS 243453 TO BUS 243468 CKT 4 / 243453 05BEATTY 345 243468 05BEATTX 138 4 END

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