Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-083

ED LOWE-KENZIE CREEK 138 KV

120 MW Capacity / 150 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 AEP.

2 Preface

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

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

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

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

3 General

The Interconnection Customer (IC), has proposed a Solar; Storage generating facility located in Cass County, Michigan. The installed facilities will have a total capability of 150 MW with 120 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-083
Project Name	ED LOWE-KENZIE CREEK 138 KV
State	Michigan
County	Cass
Transmission Owner	AEP
MFO	150
MWE	150
MWC	120
Fuel	Solar; Storage
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

AF2-083 will interconnect with the AEP transmission system along one of the following Points of Interconnection:

Primary POI: Tap - Ed Lowe to Kenzie Creek 138 kV line

AF2-083 will interconnect with the AEP transmission system via a new station cut into the Ed Lowe – Kenzie Creek section of the Corey – Kenzie Creek 138 kV circuit.

To accommodate the interconnection on Ed Lowe – Kenzie Creek section of the Corey – Kenzie Creek 138 kV circuit, a new three (3) circuit breaker 138 kV switching station physically configured in a breaker and half bus arrangement but operated as a ring-bus will be constructed (see Figure 1). Installation of associated protection and control equipment, 138 kV line risers, SCADA, and 138 kV revenue metering will also be required. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.

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

Secondary POI: Dailey 69 kV substation

AF2-083 will interconnect with the AEP transmission system via a new station cut into the Pokagon – Stone Lake 69 kV line.

To accommodate the interconnection on Pokagon – Stone Lake 69 kV line, a new three (3) circuit breaker 69 kV switching station physically configured in a breaker and half bus arrangement but operated as a ring-bus will be constructed (see Figure 3). Installation of associated protection and control equipment, 69 kV line risers, SCADA, and 138 kV revenue metering will also be required. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.

5 Cost Summary

The AF2-083 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$9,688,000
Total System Network Upgrade Costs	$51,269,201
Total Costs	$60,957,201

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.

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

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
138 kV Revenue Metering	$388,000
Generator lead first span exiting the POI station, including the first structure outside the fence	$400,000
Total Attachment Facility Costs	$788,000

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
A new three (3) circuit breaker 138 kV switching station physically configured in a breaker and half bus arrangement but operated as a ring-bus will be constructed (see Figure 1).	$8,040,000
Total Direct Connection Facility Costs	$8,040,000

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
Kenzie Creek – Corey 138 kV T-line cut in	$770,000
Review Protection and Control settings at the Kenzie Creek 138 kV substation.	$45,000
Review Protection and Control settings at the Corey 138 kV substation.	$45,000
Total Non-Direct Connection Facility Costs	$860,000

7 Incremental Capacity Transfer Rights (ICTRs)

Will be determined at a later study phase

8 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 signing Agreement execution.

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 Meteorological Data Reporting Requirements

Solar generation facilities shall provide the Transmission Provider with site-specific meteorological data including:

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

10.3 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/

11 Summer Peak - Load Flow Analysis – Primary POI

The Queue Project AF2-083 was evaluated as a 150.0 MW (Capacity 120.0 MW) injection tapping the Ed Lowe to Kenzie Creek 138 kV line in the AEP area. Project AF2-083 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-083 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

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
95660795	243265	05COREY	138.0	AEP	243346	05MOTTV	138.0	AEP	1	AEP_P2-2_#9208_05KENZIE 138_2	bus	185.0	71.09	110.56	DC	73.02
95660990	243265	05COREY	138.0	AEP	243346	05MOTTV	138.0	AEP	1	AEP_SUBT_P4_#1145_05COREY 69.0_D	breaker	185.0	96.55	108.28	DC	21.7
95660842	243287	05E.ELKHART	138.0	AEP	243346	05MOTTV	138.0	AEP	1	AEP_P2-2_#9208_05KENZIE 138_2	bus	185.0	91.59	112.49	DC	38.65
95660810	243346	05MOTTV	138.0	AEP	243287	05E.ELKHART	138.0	AEP	1	AEP_P2-2_#9208_05KENZIE 138_2	bus	185.0	59.82	101.6	DC	77.3

11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95237230	243215	05COOK	345.0	AEP	243229	05OLIVE	345.0	AEP	1	AEP_P4_#7443_05DUMONT 765_A	breaker	1409.0	133.2	134.34	DC	16.48
95237540	243215	05COOK	345.0	AEP	243229	05OLIVE	345.0	AEP	1	AEP_P1-2_#358	single	1409.0	113.78	114.79	DC	14.23
95237362	920210	AA2-116 TAP	345.0	AEP	243224	05KENZIE	345.0	AEP	1	AEP_P4_#7443_05DUMONT 765_A	breaker	1409.0	104.13	105.27	DC	16.08

11.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95237539	243215	05COOK	345.0	AEP	243229	05OLIVE	345.0	AEP	1	AEP_P1-2_#358	operation	1409.0	125.57	126.81	DC	17.79
95237470	243412	05STURGI	69.0	AEP	255331	17HOWE	69.0	NIPS	1	AEP_P1-2_#5577	operation	47.0	122.31	130.37	DC	8.41
95237636	920210	AA2-116 TAP	345.0	AEP	243224	05KENZIE	345.0	AEP	1	AEP_P1-2_#358	operation	1409.0	104.13	105.24	DC	15.63

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
95237362	5	AA2-116 TAP 345.0 kV - 05KENZIE 345.0 kV Ckt 1	**AEP** **AEPI0035a (338) : A Sag Study will be required on the 1 mile section of ACSR 795 45/7 TERN line to mitigate the overload . New Rating after the Sag Study: S/N: 251 MVA S/E: 335 MVA. Depending on the sag study results, cost for this upgrade is expected to be between $4,000 (No remediations required just sag study) and $3 million (complete line re-conductor/rebuild required). 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 : $4,000** **Time Estimate : 6-12 Months**	$4,000
95237230,95237540	4	05COOK 345.0 kV - 05OLIVE 345.0 kV Ckt 1	**AEP** **AEPI0020a (304) : Rebuild / re-conductor 23.6 miles of ACSR ~ 954 ~ 45/7 ~ RAIL - Conductor section 1** **Project Type : FAC** **Cost : $47,200,000** **Time Estimate : 24- 36 Months** **AEPI0020b (305) : Replace 2 Cook circuit breakers (3000A)** **Project Type : FAC** **Cost : $2,000,000** **Time Estimate : 12-18 Months** **AEPI0020c (306) : Replace 2 Olive circuit breakers (3000A)** **Project Type : FAC** **Cost : $2,000,001** **Time Estimate : 12-18 Months** **AEPI0020J (313) : A Sag Study will be required on the 23.6 miles section of ACSR ~ 954 ~ 45/7 ~ RAIL line to mitigate the overload. New ratings after the sag study: S/N: 1409 MVA , S/E: 1887 MVA. Depending on the sag study results, cost for this upgrade is expected to be between $93,600 (no remediations required just sag study) and $47.2million (complete line re-conductor/rebuild required)** **Project Type : FAC** **Cost : $93,600** **Time Estimate : sag study : 6-12 Months**	$51,200,001
95660810	3	05MOTTV 138.0 kV - 05E.ELKHART 138.0 kV Ckt 1	**AEP** **AEPI0031a (334) : A Sag Study will be required on the 7.8 mile section of ACSR 477 26/7 HAWK line to mitigate the overload . New Rating after the**	$31,200

95660842	2	**05E.ELKHART 138.0 kV - 05MOTTV 138.0 kV Ckt 1**	**Sag Study: S/N: 185 MVA S/E: 257 MVA. Depending on the sag study results, cost for this upgrade is expected to be between $31,200 (No remediations required just sag study) and $23.4 million (complete line re-conductor/rebuild required). 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 : $31,200** **Time Estimate : 6-12 Months**	
95660990,95660795	1	**05COREY 138.0 kV - 05MOTTV 138.0 kV Ckt 1**	**AEP** **AEPI0030a (332) : A Sag Study will be required on the 8.5 mile section of ACSR 477 26/7 HAWK line to mitigate the overload . New Rating after the Sag Study: S/N: 185 MVA S/E: 257 MVA. Depending on the sag study results, cost for this upgrade is expected to be between $34,000 (No remediations required just sag study) and $12.75 million (complete line re-conductor/rebuild required). 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 : $34,000** **Time Estimate : 6-12 Months**	$34,000
			TOTAL COST	**$51,269,201**

11.6 Flow Gate Details – Primary POI

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

11.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95660795	243265	05COREY	AEP	243346	05MOTTV	AEP	1	AEP_P2-2_#9208_05KENZIE 138_2	bus	185.0	71.09	110.56	DC	73.02

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
247966	05WTRV SLR E	0.1344	Adder	0.16
936141	AD2-020 C O1	8.9811	50/50	8.9811
936142	AD2-020 E O1	5.5279	50/50	5.5279
943021	AE2-325 C	4.5486	50/50	4.5486
943022	AE2-325 E	3.0251	50/50	3.0251
944161	AF1-084 C	6.6348	50/50	6.6348
944162	AF1-084 E	3.7896	50/50	3.7896
944961	AF1-161 C	3.6272	50/50	3.6272
944962	AF1-161 E	3.6272	50/50	3.6272
945111	AF1-176 C O1	75.7804	50/50	75.7804
945112	AF1-176 E O1	70.2507	50/50	70.2507
957891	AF2-083 C O1	58.4124	50/50	58.4124
957892	AF2-083 E O1	14.6031	50/50	14.6031
960981	AF2-389 C	4.4694	50/50	4.4694
960982	AF2-389 E	2.9796	50/50	2.9796
961051	AF2-396 O1	53.2940	50/50	53.2940
WEC	WEC	0.0035	Confirmed LTF	0.0035
NEWTON	NEWTON	0.0247	Confirmed LTF	0.0247
FARMERCITY	FARMERCITY	0.0002	Confirmed LTF	0.0002
CALDERWOOD	CALDERWOOD	0.0094	Confirmed LTF	0.0094
NY	NY	0.0028	Confirmed LTF	0.0028
CBM-W1	CBM-W1	0.9883	Confirmed LTF	0.9883
PRAIRIE	PRAIRIE	0.0413	Confirmed LTF	0.0413
O-066	O-066	0.0336	Confirmed LTF	0.0336
CHEOAH	CHEOAH	0.0090	Confirmed LTF	0.0090
TILTON	TILTON	0.0176	Confirmed LTF	0.0176
G-007	G-007	0.0062	Confirmed LTF	0.0062
MADISON	MADISON	0.0645	Confirmed LTF	0.0645
GIBSON	GIBSON	0.0191	Confirmed LTF	0.0191
BLUEG	BLUEG	0.0538	Confirmed LTF	0.0538
TRIMBLE	TRIMBLE	0.0173	Confirmed LTF	0.0173
CATAWBA	CATAWBA	0.0056	Confirmed LTF	0.0056

11.6.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95660842	243287	05E.ELKHART	AEP	243346	05MOTTV	AEP	1	AEP_P2-2_#9208_05KENZIE 138_2	bus	185.0	91.59	112.49	DC	38.65

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943023	AE2-325 BAT	8.3650	50/50	8.3650
944963	AF1-161 BAT	8.0125	50/50	8.0125
945113	AF1-176 BAT	62.6563	50/50	62.6563
957893	AF2-083 BAT	38.6512	50/50	38.6512
961052	AF2-396 BAT	23.3232	50/50	23.3232
WEC	WEC	0.0044	Confirmed LTF	0.0044
LGEE	LGEE	0.0217	Confirmed LTF	0.0217
CPLE	CPLE	0.0106	Confirmed LTF	0.0106
CBM-W2	CBM-W2	0.2539	Confirmed LTF	0.2539
NY	NY	0.0011	Confirmed LTF	0.0011
TVA	TVA	0.0378	Confirmed LTF	0.0378
CBM-S2	CBM-S2	0.1040	Confirmed LTF	0.1040
CBM-S1	CBM-S1	0.2471	Confirmed LTF	0.2471
MEC	MEC	0.0334	Confirmed LTF	0.0334

11.6.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95660810	243346	05MOTTV	AEP	243287	05E.ELKHART	AEP	1	AEP_P2-2_#9208_05KENZIE 138_2	bus	185.0	59.82	101.6	DC	77.3

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246536	05MOTTVILL	0.1632	50/50	0.1632
247966	05WTRV SLR E	0.1488	Adder	0.18
936141	AD2-020 C O1	9.9195	50/50	9.9195
936142	AD2-020 E O1	6.1055	50/50	6.1055
943021	AE2-325 C	5.0238	50/50	5.0238
943022	AE2-325 E	3.3412	50/50	3.3412
944161	AF1-084 C	7.4355	50/50	7.4355
944162	AF1-084 E	4.2469	50/50	4.2469
944961	AF1-161 C	4.0062	50/50	4.0062
944962	AF1-161 E	4.0062	50/50	4.0062
945111	AF1-176 C O1	80.2297	50/50	80.2297
945112	AF1-176 E O1	74.3753	50/50	74.3753
957891	AF2-083 C O1	61.8420	50/50	61.8420
957892	AF2-083 E O1	15.4605	50/50	15.4605
960981	AF2-389 C	5.4108	50/50	5.4108
960982	AF2-389 E	3.6072	50/50	3.6072
961051	AF2-396 O1	58.3080	50/50	58.3080
NEWTON	NEWTON	0.0408	Confirmed LTF	0.0408
FARMERCITY	FARMERCITY	0.0013	Confirmed LTF	0.0013
CALDERWOOD	CALDERWOOD	0.0119	Confirmed LTF	0.0119
CBM-W1	CBM-W1	1.0258	Confirmed LTF	1.0258
PRAIRIE	PRAIRIE	0.0801	Confirmed LTF	0.0801
CHEOAH	CHEOAH	0.0120	Confirmed LTF	0.0120
EDWARDS	EDWARDS	0.0063	Confirmed LTF	0.0063
TILTON	TILTON	0.0283	Confirmed LTF	0.0283
MADISON	MADISON	0.0302	Confirmed LTF	0.0302
GIBSON	GIBSON	0.0251	Confirmed LTF	0.0251
BLUEG	BLUEG	0.0677	Confirmed LTF	0.0677
TRIMBLE	TRIMBLE	0.0217	Confirmed LTF	0.0217
CATAWBA	CATAWBA	0.0063	Confirmed LTF	0.0063

11.6.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95237230	243215	05COOK	AEP	243229	05OLIVE	AEP	1	AEP_P4_#7443_05DUMONT 765_A	breaker	1409.0	133.2	134.34	DC	16.48

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243440	05CKG1	50.8080	50/50	50.8080
243441	05CKG2	57.3454	50/50	57.3454
244412	05WTRV SLR C	0.0541	50/50	0.0541
247528	05COVRT1	7.6224	50/50	7.6224
247529	05COVRT2	7.6224	50/50	7.6224
247530	05COVRT3	7.6224	50/50	7.6224
247531	05COVRT4	4.5748	50/50	4.5748
247532	05COVRT5	4.5748	50/50	4.5748
247533	05COVRT6	4.5748	50/50	4.5748
247604	X1-042	0.0740	50/50	0.0740
247651	AA2-116	29.7892	50/50	29.7892
247966	05WTRV SLR E	0.3139	50/50	0.3139
276165	Z1-106 BAT2	0.6846	Merchant Transmission	0.6846
276166	Z1-106 BAT1	0.6845	Merchant Transmission	0.6845
276171	Z1-107 BAT	1.4258	Merchant Transmission	1.4258
276172	Z1-108 BAT	1.3592	Merchant Transmission	1.3592
918052	AA1-018 E OP	-7.8291	Adder	-9.21
920273	AA2-123 BAT	1.3432	Merchant Transmission	1.3432
925961	AC1-072	0.7071	50/50	0.7071
926581	AC1-141	2.7272	50/50	2.7272
927201	AC1-214 C O1	-1.0199	Adder	-1.2
932931	AC2-117	-3.6007	Adder	-4.24
933281	AC2-140 C	11.0044	50/50	11.0044
933282	AC2-140 E	0.5792	50/50	0.5792
936141	AD2-020 C O1	7.2770	50/50	7.2770
936142	AD2-020 E O1	4.4790	50/50	4.4790
936601	AD2-075	29.7192	50/50	29.7192
938261	AE1-039	0.1144	50/50	0.1144
939391	AE1-170 C O1	7.1644	50/50	7.1644
939392	AE1-170 E O1	9.8936	50/50	9.8936
939683	AE1-198 BAT	7.2250	Merchant Transmission	7.2250
943021	AE2-325 C	3.6855	50/50	3.6855
943022	AE2-325 E	2.4511	50/50	2.4511
943383	AF1-009 BAT	1.6535	Merchant Transmission	1.6535
943403	AF1-011 BAT	1.9044	Merchant Transmission	1.9044
943803	AF1-048 BAT	3.5026	Merchant Transmission	3.5026
943922	AF1-060 BAT	0.6760	Merchant Transmission	0.6760
944161	AF1-084 C	6.6997	50/50	6.6997
944162	AF1-084 E	3.8267	50/50	3.8267
944961	AF1-161 C	2.9390	50/50	2.9390
944962	AF1-161 E	2.9390	50/50	2.9390
945111	AF1-176 C O1	12.8160	Adder	15.08

945112	AF1-176 E O1	11.8808	Adder	13.98
945352	AF1-200 NFTW	142.4430	Merchant Transmission	142.4430
946163	AF1-281 BAT	1.2840	Merchant Transmission	1.2840
946533	AF1-317 BAT	3.2175	Merchant Transmission	3.2175
950311	G934 C	4.3641	PJM External (MISO)	4.3641
950312	G934 E	17.4564	PJM External (MISO)	17.4564
950351	J466	3.4986	PJM External (MISO)	3.4986
950791	J201 C	0.4959	PJM External (MISO)	0.4959
950792	J201 E	1.9835	PJM External (MISO)	1.9835
950871	J246 C	0.1974	PJM External (MISO)	0.1974
950872	J246 E	0.7897	PJM External (MISO)	0.7897
950942	J325 E	0.4570	PJM External (MISO)	0.4570
951531	J533 C	5.6404	PJM External (MISO)	5.6404
951532	J533 E	22.5616	PJM External (MISO)	22.5616
951571	J538 C	3.2043	PJM External (MISO)	3.2043
951572	J538 E	12.8172	PJM External (MISO)	12.8172
951941	J602 C	3.9627	PJM External (MISO)	3.9627
951942	J602 E	21.4393	PJM External (MISO)	21.4393
952161	J571	0.8893	PJM External (MISO)	0.8893
952201	J589 C	4.2747	PJM External (MISO)	4.2747
952202	J589 E	23.1273	PJM External (MISO)	23.1273
952312	J646 E	0.1723	PJM External (MISO)	0.1723
952401	J752 C	1.8439	PJM External (MISO)	1.8439
952402	J752 E	9.9761	PJM External (MISO)	9.9761
952611	J717 C	4.0864	PJM External (MISO)	4.0864
952612	J717 E	22.1087	PJM External (MISO)	22.1087
952761	J728 C	3.8003	PJM External (MISO)	3.8003
952762	J728 E	20.5882	PJM External (MISO)	20.5882
952881	J758	26.1700	PJM External (MISO)	26.1700
952971	J793	142.6174	PJM External (MISO)	142.6174
953071	J794 C	0.2618	PJM External (MISO)	0.2618
953072	J794 E	1.4162	PJM External (MISO)	1.4162
953271	J701 C	0.9071	PJM External (MISO)	0.9071
953272	J701 E	4.9077	PJM External (MISO)	4.9077
953291	J796	30.7593	PJM External (MISO)	30.7593
953321	J799	17.9399	PJM External (MISO)	17.9399
953361	J806	18.5594	PJM External (MISO)	18.5594
953771	J832	13.9050	PJM External (MISO)	13.9050
953781	J833	9.4160	PJM External (MISO)	9.4160
953811	J839	11.0170	PJM External (MISO)	11.0170
953941	J857	15.9286	PJM External (MISO)	15.9286
954111	J875	15.4290	PJM External (MISO)	15.4290
954591	J937	78.9553	PJM External (MISO)	78.9553
955071	J984 C	4.5387	PJM External (MISO)	4.5387
955072	J984 E	24.5553	PJM External (MISO)	24.5553
955121	J989	9.5592	PJM External (MISO)	9.5592
955181	J996	7.4832	PJM External (MISO)	7.4832
955261	J1005	25.7420	PJM External (MISO)	25.7420
955591	J1043 C	3.0932	PJM External (MISO)	3.0932
955592	J1043 E	54.8115	PJM External (MISO)	54.8115
955781	J1062	12.5580	PJM External (MISO)	12.5580
955861	J1071	15.5140	PJM External (MISO)	15.5140
956011	J1088	19.0800	PJM External (MISO)	19.0800

956021	J1089	21.5526	PJM External (MISO)	21.5526
956031	J1090	10.5030	PJM External (MISO)	10.5030
956161	J1103	2.3734	PJM External (MISO)	2.3734
956741	J1172	6.1320	PJM External (MISO)	6.1320
956751	J1173	8.0560	PJM External (MISO)	8.0560
956801	J1178	7.8897	PJM External (MISO)	7.8897
957333	AF2-027 BAT	1.8105	Merchant Transmission	1.8105
957373	AF2-031 BAT	0.7567	Merchant Transmission	0.7567
957843	AF2-078 BAT	0.7713	Merchant Transmission	0.7713
957891	AF2-083 C O1	13.1832	50/50	13.1832
957892	AF2-083 E O1	3.2958	50/50	3.2958
958013	AF2-095 BAT	1.5281	Merchant Transmission	1.5281
958023	AF2-096 BAT	2.7248	Merchant Transmission	2.7248
958923	AF2-183 BAT	2.7221	Merchant Transmission	2.7221
959353	AF2-226 BAT	1.8399	Merchant Transmission	1.8399
960283	AF2-319 BAT	1.8399	Merchant Transmission	1.8399
960382	AF2-329 BAT	1.8863	Merchant Transmission	1.8863
960603	AF2-351 BAT	0.7640	Merchant Transmission	0.7640
960981	AF2-389 C	1.2257	Adder	2.72
960982	AF2-389 E	0.8171	Adder	1.81
961022	AF2-393 BAT	2.0320	Merchant Transmission	2.0320
961032	AF2-394 BAT	1.3547	Merchant Transmission	1.3547
961051	AF2-396 O1	21.8760	50/50	21.8760
NEWTON	NEWTON	4.1486	Confirmed LTF	4.1486
FARMERCITY	FARMERCITY	0.2704	Confirmed LTF	0.2704
G-007A	G-007A	1.8892	Confirmed LTF	1.8892
VFT	VFT	5.1020	Confirmed LTF	5.1020
CALDERWOOD	CALDERWOOD	0.6645	Confirmed LTF	0.6645
PRAIRIE	PRAIRIE	9.9730	Confirmed LTF	9.9730
CHEOAH	CHEOAH	0.6587	Confirmed LTF	0.6587
EDWARDS	EDWARDS	2.1865	Confirmed LTF	2.1865
TILTON	TILTON	2.8514	Confirmed LTF	2.8514
GIBSON	GIBSON	1.4305	Confirmed LTF	1.4305
BLUEG	BLUEG	3.0588	Confirmed LTF	3.0588
TRIMBLE	TRIMBLE	0.9639	Confirmed LTF	0.9639
CATAWBA	CATAWBA	0.2411	Confirmed LTF	0.2411

11.6.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
95237362	920210	AA2-116 TAP	AEP	243224	05KENZIE	AEP	1	AEP_P4_#7443_05DUMONT 765_A	breaker	1409.0	104.13	105.27	DC	16.08

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243440	05CKG1	36.0104	50/50	36.0104
243441	05CKG2	40.6778	50/50	40.6778
247528	05COVRT1	4.3966	50/50	4.3966
247529	05COVRT2	4.3966	50/50	4.3966
247530	05COVRT3	4.3966	50/50	4.3966
247531	05COVRT4	2.6387	50/50	2.6387
247532	05COVRT5	2.6387	50/50	2.6387
247533	05COVRT6	2.6387	50/50	2.6387
247651	AA2-116	70.1146	50/50	70.1146
925961	AC1-072	0.4078	50/50	0.4078
926581	AC1-141	6.4189	50/50	6.4189
933281	AC2-140 C	7.8060	50/50	7.8060
933282	AC2-140 E	0.4108	50/50	0.4108
936601	AD2-075	17.1419	50/50	17.1419
943023	AE2-325 BAT	6.8481	50/50	6.8481
944963	AF1-161 BAT	6.5595	50/50	6.5595
945113	AF1-176 BAT	12.2188	50/50	12.2188
950311	G934 C	1.9893	PJM External (MISO)	1.9893
950312	G934 E	7.9572	PJM External (MISO)	7.9572
950791	J201 C	0.2145	PJM External (MISO)	0.2145
950792	J201 E	0.8579	PJM External (MISO)	0.8579
950871	J246 C	0.0892	PJM External (MISO)	0.0892
950872	J246 E	0.3566	PJM External (MISO)	0.3566
951531	J533 C	2.5472	PJM External (MISO)	2.5472
951532	J533 E	10.1888	PJM External (MISO)	10.1888
951941	J602 C	1.7263	PJM External (MISO)	1.7263
951942	J602 E	9.3397	PJM External (MISO)	9.3397
952161	J571	0.3687	PJM External (MISO)	0.3687
952201	J589 C	1.9063	PJM External (MISO)	1.9063
952202	J589 E	10.3137	PJM External (MISO)	10.3137
952401	J752 C	0.7862	PJM External (MISO)	0.7862
952402	J752 E	4.2538	PJM External (MISO)	4.2538
952611	J717 C	1.7977	PJM External (MISO)	1.7977
952612	J717 E	9.7261	PJM External (MISO)	9.7261
952761	J728 C	1.6718	PJM External (MISO)	1.6718
952762	J728 E	9.0572	PJM External (MISO)	9.0572
952881	J758	10.5520	PJM External (MISO)	10.5520
953071	J794 C	0.1161	PJM External (MISO)	0.1161
953072	J794 E	0.6279	PJM External (MISO)	0.6279
953271	J701 C	0.3873	PJM External (MISO)	0.3873
953272	J701 E	2.0955	PJM External (MISO)	2.0955

953291	J796	13.4868	PJM External (MISO)	13.4868
953361	J806	7.4589	PJM External (MISO)	7.4589
953771	J832	6.2030	PJM External (MISO)	6.2030
953941	J857	6.4087	PJM External (MISO)	6.4087
954591	J937	31.3296	PJM External (MISO)	31.3296
955071	J984 C	2.0689	PJM External (MISO)	2.0689
955072	J984 E	11.1931	PJM External (MISO)	11.1931
955121	J989	4.0688	PJM External (MISO)	4.0688
955261	J1005	11.2880	PJM External (MISO)	11.2880
955591	J1043 C	1.4442	PJM External (MISO)	1.4442
955592	J1043 E	25.5912	PJM External (MISO)	25.5912
955861	J1071	7.0950	PJM External (MISO)	7.0950
956011	J1088	8.2650	PJM External (MISO)	8.2650
956021	J1089	9.3398	PJM External (MISO)	9.3398
956161	J1103	1.0134	PJM External (MISO)	1.0134
956741	J1172	2.6415	PJM External (MISO)	2.6415
957893	AF2-083 BAT	16.0763	50/50	16.0763
961052	AF2-396 BAT	9.4768	50/50	9.4768
NEWTON	NEWTON	1.5462	Confirmed LTF	1.5462
FARMERCITY	FARMERCITY	0.1058	Confirmed LTF	0.1058
CALDERWOOD	CALDERWOOD	0.4294	Confirmed LTF	0.4294
NY	NY	0.0614	Confirmed LTF	0.0614
CBM-W1	CBM-W1	3.1650	Confirmed LTF	3.1650
PRAIRIE	PRAIRIE	3.9494	Confirmed LTF	3.9494
O-066	O-066	0.9811	Confirmed LTF	0.9811
CHEOAH	CHEOAH	0.4294	Confirmed LTF	0.4294
EDWARDS	EDWARDS	0.8078	Confirmed LTF	0.8078
TILTON	TILTON	0.8889	Confirmed LTF	0.8889
G-007	G-007	0.1529	Confirmed LTF	0.1529
GIBSON	GIBSON	0.6350	Confirmed LTF	0.6350
BLUEG	BLUEG	1.8488	Confirmed LTF	1.8488
TRIMBLE	TRIMBLE	0.5938	Confirmed LTF	0.5938
CATAWBA	CATAWBA	0.2342	Confirmed LTF	0.2342

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
AA1-018	Powerton-Goodings Grove	In Service
AA2-116	Cook-East Elkhart 345kV	Under Construction
AA2-123	Marengo 34kV	In Service
AC1-072	Segreto (Covert) 345kV	In Service
AC1-141	Cook-East Elkhart 345kV	Under Construction
AC1-214	Crescent Ridge	Engineering and Procurement
AC2-117	University Park North	Engineering and Procurement
AC2-140	DC Cook Unit 2	Engineering and Procurement
AD2-020	Valley 138 kV	Active
AD2-075	Segreto 345kV	Active
AE1-039	West Street (Orchard Hills) 12.47 kV	Engineering and Procurement
AE1-170	Kenzie Creek-Colby 138 kV	Active
AE1-198	Crete 345 kV	Active
AE2-325	Valley 138 kV	Active
AF1-009	Dixon-McGirr	Active
AF1-011	Schauff Road	Active
AF1-048	Belvidere-Marengo	Active
AF1-060	Lena 138 kV	Active
AF1-084	East Hartford-Murch 69 kV	Active
AF1-161	Valley 138 kV	Active
AF1-176	Corey 138 kV	Active
AF1-200	Plano 345 kV	Active
AF1-281	Nelson-Lee County	Active
AF1-317	Electric Jct-Nelson	Active
AF2-027	Zion Energy Center 345 kV	Active
AF2-031	River E.C.	Active
AF2-078	Reynolds-Olive #1 345 kV	Active
AF2-083	Ed Lowe-Kenzie Creek 138 kV	Active
AF2-095	Wilmington-Davis Creek	Active
AF2-096	Braidwood-East Frankfort 345 kV	Active
AF2-183	Nelson-Lee County 345 kV	Active
AF2-226	Katydid Road 345 kV	Active
AF2-319	Katydid Road 345 kV	Active
AF2-329	Sandwich-Plano 138 kV	Active
AF2-351	Kensington 138 kV	Active
AF2-389	Pokagon-Corey 69 kV	Active
AF2-393	Nelson-Dixon 138 kV	Active
AF2-394	Nelson-Dixon 138 kV	Active
AF2-396	Stinger 138 kV	Active
X1-042	Watervliet	In Service
Z1-106	West Chicago 34kV	In Service

Z1-107	Joliet 34kV	In Service
Z1-108	McHenry 34kV	In Service
J1005	MISO	MISO
J1043	MISO	MISO
J1062	MISO	MISO
J1071	MISO	MISO
J1088	MISO	MISO
J1089	MISO	MISO
J1090	MISO	MISO
J1103	MISO	MISO
J1172	MISO	MISO
J1173	MISO	MISO
J1178	MISO	MISO
J201	MISO	MISO
J246	MISO	MISO
J325	MISO	MISO
J466	MISO	MISO
J533	MISO	MISO
J538	MISO	MISO
J571	MISO	MISO
J589	MISO	MISO
J602	MISO	MISO
J646	MISO	MISO
J701	MISO	MISO
J717	MISO	MISO
J728	MISO	MISO
J752	MISO	MISO
J758	MISO	MISO
J793	MISO	MISO
J794	MISO	MISO
J796	MISO	MISO
J799	MISO	MISO
J806	MISO	MISO
J832	MISO	MISO
J833	MISO	MISO
J839	MISO	MISO
J857	MISO	MISO
J875	MISO	MISO
J937	MISO	MISO
J984	MISO	MISO
J989	MISO	MISO
J996	MISO	MISO

11.8 Contingency Descriptions – Primary POI

Contingency Name	Contingency Definition
AEP_P4_#7443_05DUMONT 765_A	CONTINGENCY 'AEP_P4_#7443_05DUMONT 765_A' OPEN BRANCH FROM BUS 243205 TO BUS 243206 CKT 1 / 243205 05COOK 765 243206 05DUMONT 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 246999 CKT 1 / 243206 05DUMONT 765 246999 05SORENS 765 1 END
AEP_P1-2_#5577	CONTINGENCY 'AEP_P1-2_#5577' OPEN BRANCH FROM BUS 243287 TO BUS 243346 CKT 1 / 243287 05E.ELKHART 138 243346 05MOTTV 138 1 END
AEP_P1-2_#358	CONTINGENCY 'AEP_P1-2_#358' OPEN BRANCH FROM BUS 243205 TO BUS 243206 CKT 1 / 243205 05COOK 765 243206 05DUMONT 765 1 END
AEP_P2-2_#9208_05KENZIE 138_2	CONTINGENCY 'AEP_P2-2_#9208_05KENZIE 138_2' OPEN BRANCH FROM BUS 957890 TO BUS 243322 CKT 1 / 957890 AF2-083 TAP 138 243322 05KENZIE 138 1 END
AEP_SUBT_P4_#1145_05COREY 69.0_D	CONTINGENCY 'AEP_SUBT_P4_#1145_05COREY 69.0_D' OPEN BRANCH FROM BUS 243201 TO BUS 243265 CKT 1 / 243201 05COREY EQ 999 243265 05COREY 138 1 OPEN BRANCH FROM BUS 247782 TO BUS 243265 CKT 2 / 247782 05COREY EQ2 999 243265 05COREY 138 2 OPEN BRANCH FROM BUS 243201 TO BUS 246515 CKT 1 / 243201 05COREY EQ 999 246515 05COREY 69.0 1 OPEN BRANCH FROM BUS 247782 TO BUS 246515 CKT 2 / 247782 05COREY EQ2 999 246515 05COREY 69.0 2 OPEN BRANCH FROM BUS 246515 TO BUS 246520 CKT 1 / 246515 05COREY 69.0 246520 05FLORENCE 69.0 1 OPEN BRANCH FROM BUS 246515 TO BUS 246525 CKT 1 / 246515 05COREY 69.0 246525 05JONES 8 69.0 1 OPEN BRANCH FROM BUS 246515 TO BUS 246547 CKT 1 / 246515 05COREY 69.0 246547 05MOOREPKZ 69.0 1 OPEN BRANCH FROM BUS 246515 TO BUS 244519 CKT 1 / 246515 05COREY 69.0 244519 05RIPPLE 69.0 1 REMOVE SWSHUNT FROM BUS 246515 / 246515 05COREY 69.0 END

12 Light Load Analysis

Light Load Studies (As applicable)

To be determined during later study phases.

13 Short Circuit Analysis – Primary POI

The following Breakers are overdutied:

To be determined during later study phases.

14 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.

15 Affected Systems

15.1 LG&E

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

15.2 MISO

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

15.3 TVA

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

15.4 Duke Energy Progress

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

15 Summer Peak – Load Flow Analysis – Secondary POI

The Queue Project AF2-083 was evaluated as a 150.0 MW (Capacity 120.0 MW) injection at the Dailey 69 kV substation in the AEP area. Project AF2-083 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-083 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

15.1 Generation Deliverability

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

None

15.2 Multiple Facility Contingency

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

None

15.3 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)

None

15.4 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
95237539	243215	05COOK	345.0	AEP	243229	05OLIVE	345.0	AEP	1	AEP_P1-2_#358	operation	1409.0	125.57	126.04	DC	14.83
95237470	243412	05STURGI	69.0	AEP	255331	17HOWE	69.0	NIPS	1	AEP_P1-2_#5577	operation	47.0	122.31	131.83	DC	9.93

15.5 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".

15.6 Contingency Descriptions – Secondary POI

Contingency Name	Contingency Definition
AEP_P1-2_#358	CONTINGENCY 'AEP_P1-2_#358' OPEN BRANCH FROM BUS 243205 TO BUS 243206 CKT 1 / 243205 05COOK 765 243206 05DUMONT 765 1 END
AEP_P1-2_#5577	CONTINGENCY 'AEP_P1-2_#5577' OPEN BRANCH FROM BUS 243287 TO BUS 243346 CKT 1 / 243287 05E.ELKHART 138 243346 05MOTTV 138 1 END