Generation Interconnection

Feasibility Study Report

for

PJM Generation Interconnection Request

Queue Project AE1-142

"MANITOU-PLEASANT PLAINS 34.5 KV"

8.2 MW Capacity / 20 MW Energy

March, 2019

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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 Jersey Central Power & Light Company (JCPL).

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Preface

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

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

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

PJM utilizes manufacturer models to ensure the performance of turbines is properly captured during the simulations performed for stability verification and, where applicable, for compliance with low voltage ride through requirements. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment B of Manual 14G. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a $10,000 fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

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

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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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General

The Interconnection Customer (IC) has proposed a new solar generating facility to be located at 227 Oak Ridge Parkway, Toms River, New Jersey 08755. The installed facilities will have a total capability of **20.0 MW** with **8.2 MW** of this output being recognized by PJM as Capacity. The proposed in-service date for this project is **July 31, 2020. This study does not imply a Jersey Central Power & Light Company (JCPL) commitment to this in-service date.**

Queue Number	**AE1-142**
Project Name	MANITOU-PLEASANT PLAINS 34.5 KV
Interconnection Customer	
State	New Jersey
County	Ocean
Transmission Owner	JCPL
MFO	20
MWE	20
MWC	8.2
Fuel	Solar
Basecase Study Year	2022

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Point of Interconnection

Primary Point of Interconnection

The AE1-142 "Manitou-Pleasant Plains 34.5 kV" generation project will interconnect with the Manitou-Pleasant Plains (C55) 34.5 kV line. The primary direct connection of this project will be accomplished by tapping the Manitou-Pleasant Plains (C55) 34.5 kV line, and installing one span of overhead 34.5 kV line to the Point of Interconnection (POI) including 34.5 kV interconnection metering. The line tap would be located approximately 4.3 miles from Manitou Substation. This is the primary Point of Interconnection (POI) chosen by the IC. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection line tap and the associated attachment facilities. The project will require non-direct connection relay upgrades at Manitou substation.

Attachment 1 shows a one-line diagram of the proposed primary direct connection of the (AE1-142) generation project to the Jersey Central Power & Light transmission systems. 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. IC may not install above ground equipment within any JCPL right-of-way unless permission to do so is expressly granted by JCPL. The IC will also be responsible for the rough grade of the property and an access road to the proposed site.

Secondary Point of Interconnection

The IC requested that a secondary POI be reviewed for network impacts (Option 2). The secondary interconnection chosen was a tap off of the Lakehurst-Manitou (O41) 34.5 kV line. The tap point would be located approximately 4.3 miles from the Manitou Substation.

This report does not provide costs for the physical interconnection of Option 2. It was just analyzed for network impacts to the system. Results are shown in the "Network Impacts – Option 2" section of this report.

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Cost Summary

The AE1-142 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$ 252,400
Direct Connection Network Upgrade	$ 0
Non Direct Connection Network Upgrades	$ 15,300
Total Costs	$ 267,700

In addition, the AE1-142 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	$184,725,000

Cost allocations for these upgrades will be provided in the System Impact Study Report.

The transmission and substation costs given above exclude the Contribution in Aid of Construction ("CIAC") Federal Income Tax Gross up charge. If at a future date Federal CIAC taxes are deemed necessary by the IRS for this project, JPCL shall be reimbursed by the Interconnection Customer for such taxes. JPCL estimates the tax, if applicable, would be approximately $42,200 for the Attachment Facilities and Non-Direct Connection Network Upgrades and $29,040,000 for the Network Upgrades.

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of the AE1-142 generation project to the JCPL Transmission System is detailed in the following sections. The associated one-line with the generation project attachment facilities and primary direct and non-direct connection are shown in Attachment 1.

Note that the FE 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. FE 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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Transmission Owner Scope of Work

Attachment Facilities

To accommodate the proposed AE1-142 Project, JCPL will tap the Manitou-Pleasant Plains (C55) 34.5 kV line and install one span of overhead 34.5 kV line to the point of interconnection ("POI") including 34.5 kV interconnection metering. The line tap would be located approximately 4.3 miles from Manitou Substation. The IC will be responsible for acquiring all easements, properties and permits that may be required to construct the associated facilities. JCPL will also remove the connection from O41 and C55 to no longer allow the ability for the lines to be tied together.

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
Construct a 34.5 line tap/connection, including 1 span of 34.5kV line to the point of interconnection at Manitou-Pleasant Plains (C55) 34.5kV. Remove the connection from O41 and C55 to no longer allow the ability for the lines to be tied together. @ Lakehurst-Manitou (O41) 34.5 kV line retermination.	$252,400
Total Attachment Facility Costs	$252,400

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Direct Connection Cost Estimate

There is no Direct Connection scope of work required for this project.

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
Manitou 34.5 kV Substation- Adjust remote relay and metering settings	$15,300
Total Non-Direct Connection Facility Costs	$15,300

The total Non-Direct Connection cost estimate for the AE1-142 project is approximately $15,300.

Remote relay and metering setting changes will need to be made at Manitou Substations to facilitate the interconnection of the new generation.

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Incremental Capacity Transfer Rights (ICTRs)

Will be determined at a later study phase.

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Schedule

Based on the extent of the JCPL primary Attachment Facilities and Non-Direct Connection work required to support the AE1-142 generation project, it is expected to take a minimum of **seven (7) 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 FE 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.

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

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Transmission Owner Analysis

Power Flow Analysis

PJM performed a power flow analysis of the transmission system using a 2022 summer peak load flow model and the results were verified by FE. Additionally, FE performed an analysis of its underlying transmission <100 kV system. At the Primary POI, the AE1-142 project contributes to overloads on the FE transmission system as shown in the "Network Impact – Option 1" section of the report. The estimated cost of system reinforcements necessary to mitigate these overloads are also provided. At the Secondary POI, the AE1-142 project contributes to overloads on the FE transmission system as shown in the "Network Impacts – Option 2" section of the report. Cost estimates are not provided for the secondary POI.

Short Circuit Analysis

PJM performed a short circuit analysis and the results were verified by FE. The connection of AE1-142 project to the system does not result in any newly overdutied circuit breakers on the FE transmission system and does not have a significant fault current contribution to existing overdutied circuit breakers

Stability Analysis

PJM will complete a dynamic stability analysis, if necessary, as part of the System Impact Study. The results of this analysis will be reviewed by FE. Should stability concerns be identified in PJM's study, FE will develop appropriate system reinforcement(s) and included the estimated cost of any reinforcement(s) in FE's System Impact Study report.

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Interconnection Customer Requirements

System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in FE's "Requirements for Transmission Connected Facilities" document located at: http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.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.

Compliance Issues and Interconnection Customer Requirements

The proposed Customer Facilities must be designed in accordance with FE's "Requirements for Transmission Connected Facilities" document located at: http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx. In particular, the IC is responsible for the following:

1. The purchase and installation of a fully rated 34.5 kV circuit breaker to protect the AE1-142 generator lead line. A single circuit breaker must be used to protect this line; if the project has several GSU transformers, the individual GSU transformer breakers cannot be used to protect this line.

2. The purchase and installation of the minimum required FE generation interconnection relaying and control facilities. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.

3. The purchase and installation of supervisory control and data acquisition ("SCADA") equipment to provide information in a compatible format to the FE Transmission System Control Center.

4. Compliance with the FE and PJM generator power factor and voltage control requirements.

5. The execution of a back-up service agreement to serve the customer load supplied from the AE1-142 generation project metering point when the units are out-of-service. This assumes the intent of the IC is to net the generation with the load.

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

Power Factor Requirements

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

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Revenue Metering and SCADA Requirements

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 Attachment O, Appendix 2, Section 8.

JCPL Requirements

The IC will be required to comply with all FE revenue metering requirements for generation interconnection customers which can be found in FE's "Requirements for Transmission Connected Facilities" document located at: http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx.

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Network Impacts – Option 1

The Queue Project AE1-142 was evaluated as a 20 MW (Capacity 8.2 MW) injection at the Three River Chemical 34.5 kV substation in the JCPL area. Project AE1-142 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-142 was studied with a commercial probability of 53%. Potential network impacts were as follows:

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Summer Peak Load Flow

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Generation Deliverability

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

None

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	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
713967	206297	28MANITOU	JCPL	206296	28LEISUR U	JCPL	1	JC-P2-3-JCC-230-9A	breaker	817.0	99.95	101.16	DC	9.87
713976	206297	28MANITOU	JCPL	206295	28LEISUR D	JCPL	1	JC-P2-3-JCC-230-10A	breaker	817.0	98.79	100.03	DC	10.13
715234	206319	28WHITINGS	JCPL	206720	28MANCHSTR	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	101.92	103.17	DC	10.84
715252	206720	28MANCHSTR	JCPL	206318	28VANHISVL	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	100.18	101.43	DC	10.84

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	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
715073	206297	28MANITOU	JCPL	206319	28WHITINGS	JCPL	1	JC-P7-1-JCC-230-10A	tower	817.0	119.71	120.89	DC	9.59
715074	206297	28MANITOU	JCPL	206319	28WHITINGS	JCPL	1	JC-P7-1-JCC-230-12	tower	817.0	111.4	112.57	DC	9.49
714935	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	113.1	114.28	DC	6.63
714936	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-12	tower	564.0	101.33	102.51	DC	6.68

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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
713584	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13H	breaker	817.0	130.28	131.56	DC	10.41
713585	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13D	breaker	817.0	129.63	130.96	DC	10.82
713682	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13B	breaker	869.0	120.6	121.85	DC	10.84
713683	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13A	breaker	869.0	120.22	121.44	DC	10.58
713684	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-8A	breaker	869.0	116.42	117.51	DC	9.4

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.

None

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System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
713976, 713967	2	**28MANITOU 230.0 kV - 28LEISUR D 230.0 kV Ckt 1**	**JCPL** Description : a) Terminal upgrade at Leisure Village substation on the Manitou C2029 exit to 2-wire 1590 ACSR so it is no longer limiting element - in support of AE1-142 @ Leisure Village SS b) Terminal upgrade at Leisure Village substation on the Manitou A2027 exit to 2-wire 1590 ACSR so it is no longer limiting element - in support of AE1-142 @ Leisure Village SS Time Estimate : 6.0 Months Cost : $123,000	$123,000
715252	4	**28MANCHSTR 230.0 kV - 28VANHISVL 230.0 kV Ckt 1**	**JCPL** Description : a) Reconductor 33.7 miles between Larrabee - Van Hiseville tap - Manchester - Whitings with 1590 45/7 MCM ACSS. @ Cookstown-Larrabee-Whitings (B1042) 230kV Line Reconductor b) Replace line limiting wave trap at line terminal. @ Larrabee SS c) Replace line limiting wave trap at line terminal. @ Whitings SS Time Estimate : 31.0 Months Cost : $80,507,300	$80,507,300
715234	3	**28WHITINGS 230.0 kV - 28MANCHSTR 230.0 kV Ckt 1**		
713682,713683,713684	8	**28LAKEWOOD 230.0 kV - 28LARRABEE 230.0 kV Ckt 1**	**JCPL** Description : a) Reconductor 5.25 miles of line between Lakewood - Larrabee K2011 with 1590 45/7 MCM ACSS @ Lakewood-Larrabee (K2011) 230kV Line Reconductor b) Replace wave trap and limiting substation conductor. @ Larrabee SS c) Replace wave trap and limiting substation conductor. @ Lakewood SS Time Estimate : 19.0 Months Cost : $15,072,800	$15,072,800
713584,713585	7	**28LAKEWOOD 230.0 kV - 28LARRABEE 230.0 kV Ckt 2**	**JCPL** Description : a) Reconductor 5.25 miles of line between Lakewood - Larrabee Z2026 with 1590 45/7 MCM ACSS @ Lakewood-Larrabee (Z2026) 230kV Line Reconductor b) Replace wave trap and limiting substation conductor. @ Larrabee SS c) Replace wave trap and limiting substation conductor. @ Lakewood SS. Time Estimate : 19.0 Months Cost : $6,647,300	$6,647,300

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ID	Index	Facility	Upgrade Description	Cost
714936,714935	6	28OYSTER C 230.0 kV - CEDAR 230.0 kV Ckt 1	**JCPL** Description : Reconductor ~0.08 miles between Cedar St and Oyster Creek S2045 with 1590 45/7 MCM ACSS @ Cedar St-Oyster Creek 230kV Line Reconductor (JCPL Portion) Time Estimate : 8.0 Months Cost : $246,400	$246,400
715073,715074	5	28MANITOU 230.0 kV - 28WHITINGS 230.0 kV Ckt 1	**JCPL** Description : a) Reconductor the transmission line between Manitou and Whitings V2022 with 1590 45/7 MCM ACSS. Due to clearance violations in 67 of 97 spans, a full rebuild is assumed. @ Manitou-Whitings (V2022) 230kV Line Rebuild b) Replace line relaying at Manitou and upgrade limiting substation conductor. @ Manitou SS c) Upgrade metering and replace limiting line conductor. @ Whitings SS Time Estimate : 24.0 Months Cost : $82,128,200	$82,128,200
			TOTAL COST	**$184,725,000**

Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

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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
713967	206297	28MANITOU	JCPL	206296	28LEISUR U	JCPL	1	JC-P2-3-JCC-230-9A	breaker	817.0	99.95	101.16	DC	9.87

Bus #	Bus	MW Impact
206280	28LAKEHURS	0.44
206325	28O C GEN	308.0
206360	28O CRK C1	2.61
206361	28O CRK C2	1.68
227801	ONTC&DCT	5.51
227842	MARINGEN	0.08
227843	MARINGEN E	0.57
227927	V4-067C	0.02
227928	V4-067E	0.24
228014	PVILLEG	0.09
228712	V2-041E	0.2
292063	V1-021 E	0.03
292966	U2-045 C	0.06
292967	U2-045 E	2.49
293404	V3-036	0.79
901982	W1-119 E	1.03
901991	W1-120C	0.7
901992	W1-120E	1.15
902092	W1-130E	0.49
902432	W2-030 E	0.87
905531	W4-063 C	0.01
905532	W4-063 E	0.62
915022	Y3-012 E	1.07
917612	Z2-102 E	0.84
919662	AA2-048 E	0.5
919672	AA2-049 E	0.21
924531	AB2-102 C	18.26
924532	AB2-102 E	0.41
924701	AB2-122 C	0.1
924702	AB2-122 E	0.18
930001	AB1-001 C	0.02
930002	AB1-001 E	0.21
930891	AB1-138 C	0.74
930892	AB1-138 E	1.23
931122	AB1-163 E	0.37
931191	AB1-169A	43.85
933962	AD1-019 E	1.09
938151	AE1-020 C O1	154.63
938152	AE1-020 E O1	395.65
938301	AE1-045 C	0.16

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Bus #	Bus	MW Impact
938302	AE1-045 E	0.08
938311	AE1-046 C	0.16
938312	AE1-046 E	0.08
938421	AE1-061 C	0.21
938422	AE1-061 E	0.21
938781	AE1-104 C O1	16.65
938782	AE1-104 E O1	42.59
939121	AE1-142 C O1	4.05
939122	AE1-142 E O1	5.82
939501	AE1-179 C O1	2.44
939502	AE1-179 E O1	1.72
940001	AE1-240 C O1	2.02
940002	AE1-240 E O1	1.44
BAYOU	BAYOU	0.01
BIG_CAJUN1	BIG_CAJUN1	0.02
BIG_CAJUN2	BIG_CAJUN2	0.04
BLUEG	BLUEG	0.11
CALDERWOOD	CALDERWOOD	0.0
CANNELTON	CANNELTON	0.01
CARR	CARR	0.46
CBM-S2	CBM-S2	0.01
CHEOAH	CHEOAH	0.0
CHILHOWEE	CHILHOWEE	0.0
CHOCTAW	CHOCTAW	0.01
COFFEEN	COFFEEN	0.01
COTTONWOOD	COTTONWOOD	0.05
CPLE	CPLE	0.01
DEARBORN	DEARBORN	0.03
DUCKCREEK	DUCKCREEK	0.03
EDWARDS	EDWARDS	0.01
ELMERSMITH	ELMERSMITH	0.01
FARMERCITY	FARMERCITY	0.01
G-007	G-007	4.69
GIBSON	GIBSON	0.0
NEWTON	NEWTON	0.03
O-066	O-066	6.55
PRAIRIE	PRAIRIE	0.05
RENSSELAER	RENSSELAER	0.36
SANTEETLA	SANTEETLA	0.0
SMITHLAND	SMITHLAND	0.0
TATANKA	TATANKA	0.01
TILTON	TILTON	0.01
TRIMBLE	TRIMBLE	0.01
TVA	TVA	0.02
UNIONPOWER	UNIONPOWER	0.01

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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
713976	206297	28MANITOU	JCPL	206295	28LEISURD	JCPL	1	JC-P2-3-JCC-230-10A	breaker	817.0	98.79	100.03	DC	10.13

Bus #	Bus	MW Impact
206280	28LAKEHURS	0.45
206325	28O C GEN	307.95
206360	28O CRK C1	2.61
206361	28O CRK C2	1.68
227801	ONTC&DCT	5.51
227842	MARINGEN	0.08
227843	MARINGEN E	0.57
227927	V4-067C	0.02
227928	V4-067E	0.24
228014	PVILLEG	0.09
228712	V2-041E	0.2
292063	V1-021 E	0.03
292966	U2-045 C	0.06
292967	U2-045 E	2.49
293404	V3-036	0.79
901982	W1-119 E	1.04
901991	W1-120C	0.71
901992	W1-120E	1.16
902092	W1-130E	0.49
902432	W2-030 E	0.87
905531	W4-063 C	0.01
905532	W4-063 E	0.62
915022	Y3-012 E	1.07
917612	Z2-102 E	0.85
919662	AA2-048 E	0.5
919672	AA2-049 E	0.21
924531	AB2-102 C	18.26
924532	AB2-102 E	0.41
924701	AB2-122 C	0.1
924702	AB2-122 E	0.18
930001	AB1-001 C	0.02
930002	AB1-001 E	0.21
930891	AB1-138 C	0.75
930892	AB1-138 E	1.25
931122	AB1-163 E	0.38
931191	AB1-169A	43.85
933962	AD1-019 E	1.09
938151	AE1-020 C O1	154.6
938152	AE1-020 E O1	395.58
938301	AE1-045 C	0.16

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Bus #	Bus	MW Impact
938302	AE1-045 E	0.08
938311	AE1-046 C	0.16
938312	AE1-046 E	0.08
938421	AE1-061 C	0.21
938422	AE1-061 E	0.21
938781	AE1-104 C O1	16.65
938782	AE1-104 E O1	42.58
939121	AE1-142 C O1	4.15
939122	AE1-142 E O1	5.98
939501	AE1-179 C O1	2.44
939502	AE1-179 E O1	1.72
940001	AE1-240 C O1	2.02
940002	AE1-240 E O1	1.44
BAYOU	BAYOU	0.01
BIG_CAJUN1	BIG_CAJUN1	0.02
BIG_CAJUN2	BIG_CAJUN2	0.04
BLUEG	BLUEG	0.11
CALDERWOOD	CALDERWOOD	0.0
CANNELTON	CANNELTON	0.01
CARR	CARR	0.46
CBM-S2	CBM-S2	0.01
CHEOAH	CHEOAH	0.0
CHILHOWEE	CHILHOWEE	0.0
CHOCTAW	CHOCTAW	0.01
COFFEEN	COFFEEN	0.01
COTTONWOOD	COTTONWOOD	0.05
CPLE	CPLE	0.01
DEARBORN	DEARBORN	0.03
DUCKCREEK	DUCKCREEK	0.03
EDWARDS	EDWARDS	0.01
ELMERSMITH	ELMERSMITH	0.01
FARMERCITY	FARMERCITY	0.01
G-007	G-007	4.69
GIBSON	GIBSON	0.0
NEWTON	NEWTON	0.03
O-066	O-066	6.55
PRAIRIE	PRAIRIE	0.05
RENSSELAER	RENSSELAER	0.36
SANTEETLA	SANTEETLA	0.0
SMITHLAND	SMITHLAND	0.0
TATANKA	TATANKA	0.01
TILTON	TILTON	0.01
TRIMBLE	TRIMBLE	0.01
TVA	TVA	0.02
UNIONPOWER	UNIONPOWER	0.01

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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
715234	206319	28WHITINGS	JCPL	206720	28MANCHSTR	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	101.92	103.17	DC	10.84

Bus #	Bus	MW Impact
206306	28LKWD G1	7.06
206308	28LKWD G2	7.06
206312	28LKWD G3	4.98
206325	28O C GEN	312.94
206360	28O CRK C1	2.65
206361	28O CRK C2	1.71
206366	28LKWD CT1	13.38
206367	28LKWD CT2	13.38
227801	ONTC&DCT	5.26
227843	MARINGEN E	0.55
227928	V4-067E	0.23
292063	V1-021 E	0.03
292967	U2-045 E	2.37
293404	V3-036	0.75
902432	W2-030 E	0.83
905532	W4-063 E	0.59
915022	Y3-012 E	1.02
917612	Z2-102 E	0.76
924701	AB2-122 C	0.1
924702	AB2-122 E	0.17
930002	AB1-001 E	0.2
930891	AB1-138 C	1.34
930892	AB1-138 E	2.24
931122	AB1-163 E	0.78
933962	AD1-019 E	1.04
934351	AD1-059	1.26
938151	AE1-020 C O1	157.11
938152	AE1-020 E O1	401.99
938781	AE1-104 C O1	15.64
938782	AE1-104 E O1	40.0
939121	AE1-142 C O1	4.44
939122	AE1-142 E O1	6.39
BAYOU	BAYOU	0.25
BIG_CAJUN1	BIG_CAJUN1	0.39
BIG_CAJUN2	BIG_CAJUN2	0.79
BLUEG	BLUEG	1.25
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.08
CARR	CARR	0.39
CATAWBA	CATAWBA	0.08

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
CHOCTAW	CHOCTAW	0.26
COFFEEN	COFFEEN	0.13
COTTONWOOD	COTTONWOOD	1.01
DEARBORN	DEARBORN	0.23
DUCKCREEK	DUCKCREEK	0.29
EDWARDS	EDWARDS	0.13
ELMERSMITH	ELMERSMITH	0.13
FARMERCITY	FARMERCITY	0.09
G-007	G-007	3.18
GIBSON	GIBSON	0.05
HAMLET	HAMLET	0.26
NEWTON	NEWTON	0.34
O-066	O-066	5.15
PRAIRIE	PRAIRIE	0.64
RENSSELAER	RENSSELAER	0.31
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.16
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.14
TVA	TVA	0.42
UNIONPOWER	UNIONPOWER	0.19

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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
715252	206720	28MANCHSTR	JCPL	206318	28VANHISVL	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	100.18	101.43	DC	10.84

Bus #	Bus	MW Impact
206306	28LKWD G1	7.06
206308	28LKWD G2	7.06
206312	28LKWD G3	4.98
206325	28O C GEN	312.94
206360	28O CRK C1	2.65
206361	28O CRK C2	1.71
206366	28LKWD CT1	13.38
206367	28LKWD CT2	13.38
227801	ONTC&DCT	5.26
227843	MARINGEN E	0.55
227928	V4-067E	0.23
292063	V1-021 E	0.03
292967	U2-045 E	2.37
293404	V3-036	0.75
902432	W2-030 E	0.83
905532	W4-063 E	0.59
915022	Y3-012 E	1.02
917612	Z2-102 E	0.76
924701	AB2-122 C	0.1
924702	AB2-122 E	0.17
930002	AB1-001 E	0.2
930891	AB1-138 C	1.34
930892	AB1-138 E	2.24
931122	AB1-163 E	0.78
933962	AD1-019 E	1.04
934351	AD1-059	1.26
938151	AE1-020 C O1	157.11
938152	AE1-020 E O1	401.99
938781	AE1-104 C O1	15.64
938782	AE1-104 E O1	40.0
939121	AE1-142 C O1	4.44
939122	AE1-142 E O1	6.39
BAYOU	BAYOU	0.25
BIG_CAJUN1	BIG_CAJUN1	0.39
BIG_CAJUN2	BIG_CAJUN2	0.79
BLUEG	BLUEG	1.25
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.08
CARR	CARR	0.39
CATAWBA	CATAWBA	0.08

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
CHOCTAW	CHOCTAW	0.26
COFFEEN	COFFEEN	0.13
COTTONWOOD	COTTONWOOD	1.01
DEARBORN	DEARBORN	0.23
DUCKCREEK	DUCKCREEK	0.29
EDWARDS	EDWARDS	0.13
ELMERSMITH	ELMERSMITH	0.13
FARMERCITY	FARMERCITY	0.09
G-007	G-007	3.18
GIBSON	GIBSON	0.05
HAMLET	HAMLET	0.26
NEWTON	NEWTON	0.34
O-066	O-066	5.15
PRAIRIE	PRAIRIE	0.64
RENSSELAER	RENSSELAER	0.31
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.16
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.14
TVA	TVA	0.42
UNIONPOWER	UNIONPOWER	0.19

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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
715073	206297	28MANITOU	JCPL	206319	28WHITINGS	JCPL	1	JC-P7-1-JCC-230-10A	tower	817.0	119.71	120.89	DC	9.59

Bus #	Bus	MW Impact
206306	28LKWD G1	7.11
206308	28LKWD G2	7.11
206312	28LKWD G3	5.01
206325	28O C GEN	312.71
206360	28O CRK C1	2.65
206361	28O CRK C2	1.7
206366	28LKWD CT1	13.47
206367	28LKWD CT2	13.47
227801	ONTC&DCT	5.25
227843	MARINGEN E	0.54
227928	V4-067E	0.23
292063	V1-021 E	0.03
292967	U2-045 E	2.37
293404	V3-036	0.75
902432	W2-030 E	0.83
905532	W4-063 E	0.59
915022	Y3-012 E	1.02
924701	AB2-122 C	0.1
924702	AB2-122 E	0.17
930002	AB1-001 E	0.2
930891	AB1-138 C	0.52
930892	AB1-138 E	0.87
933962	AD1-019 E	1.03
934351	AD1-059	1.27
938151	AE1-020 C O1	156.99
938152	AE1-020 E O1	401.69
938781	AE1-104 C O1	15.61
938782	AE1-104 E O1	39.92
939121	AE1-142 C O1	3.93
939122	AE1-142 E O1	5.66
BAYOU	BAYOU	0.25
BIG_CAJUN1	BIG_CAJUN1	0.39
BIG_CAJUN2	BIG_CAJUN2	0.78
BLUEG	BLUEG	1.23
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.07
CARR	CARR	0.38
CATAWBA	CATAWBA	0.08
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04

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Bus #	Bus	MW Impact
CHOCTAW	CHOCTAW	0.26
COFFEEN	COFFEEN	0.13
COTTONWOOD	COTTONWOOD	1.0
DEARBORN	DEARBORN	0.22
DUCKCREEK	DUCKCREEK	0.28
EDWARDS	EDWARDS	0.13
ELMERSMITH	ELMERSMITH	0.13
FARMERCITY	FARMERCITY	0.09
G-007	G-007	3.14
GIBSON	GIBSON	0.05
HAMLET	HAMLET	0.26
NEWTON	NEWTON	0.34
O-066	O-066	5.1
PRAIRIE	PRAIRIE	0.63
RENSSELAER	RENSSELAER	0.3
SANTEETLA	SANTEETLA	0.03
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.15
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.14
TVA	TVA	0.42
UNIONPOWER	UNIONPOWER	0.18

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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
714935	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	113.1	114.28	DC	6.63

Bus #	Bus	MW Impact
206306	28LKWD G1	4.39
206308	28LKWD G2	4.39
206312	28LKWD G3	3.1
206325	28O C GEN	248.45
206360	28O CRK C1	2.1
206361	28O CRK C2	1.35
206366	28LKWD CT1	8.32
206367	28LKWD CT2	8.32
901982	W1-119 E	1.23
901991	W1-120C	0.84
901992	W1-120E	1.37
902082	W1-129E	0.28
902322	W2-019 E	0.31
902952	W2-082 E OP1	0.95
903982	W3-079 E	0.43
905252	W4-025 E	0.4
907082	X1-037 E	0.69
912102	X4-015 E	0.28
912182	X4-031 E	0.14
914092	Y2-051 E	0.34
917612	Z2-102 E	0.95
918452	AA1-060 E	1.49
919662	AA2-048 E	0.69
930891	AB1-138 C	0.85
930892	AB1-138 E	1.42
931122	AB1-163 E	0.75
934351	AD1-059	0.78
938151	AE1-020 C O1	124.73
938152	AE1-020 E O1	319.14
938211	AE1-034 C O1	21.02
938212	AE1-034 E O1	53.78
938421	AE1-061 C	0.23
938422	AE1-061 E	0.23
939121	AE1-142 C O1	2.72
939122	AE1-142 E O1	3.91
BAYOU	BAYOU	0.08
BIG_CAJUN1	BIG_CAJUN1	0.12
BIG_CAJUN2	BIG_CAJUN2	0.24
BLUEG	BLUEG	0.33
CALDERWOOD	CALDERWOOD	0.04

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Bus #	Bus	MW Impact
CANNELTON	CANNELTON	0.02
CATAWBA	CATAWBA	0.03
CBM-N	CBM-N	0.69
CHEOAH	CHEOAH	0.04
CHILHOWEE	CHILHOWEE	0.01
CHOCTAW	CHOCTAW	0.08
COFFEEN	COFFEEN	0.04
COTTONWOOD	COTTONWOOD	0.31
DEARBORN	DEARBORN	0.05
DUCKCREEK	DUCKCREEK	0.07
EDWARDS	EDWARDS	0.03
ELMERSMITH	ELMERSMITH	0.04
FARMERCITY	FARMERCITY	0.02
G-007A	G-007A	8.07
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.11
NEWTON	NEWTON	0.09
NYISO	NYISO	3.0
O-066A	O-066A	1.57
PRAIRIE	PRAIRIE	0.18
SANTEETLA	SANTEETLA	0.01
SMITHLAND	SMITHLAND	0.01
TATANKA	TATANKA	0.04
TILTON	TILTON	0.04
TRIMBLE	TRIMBLE	0.04
TVA	TVA	0.13
UNIONPOWER	UNIONPOWER	0.06
VFT	VFT	8.95

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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
713584	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13H	breaker	817.0	130.28	131.56	DC	10.41

Bus #	Bus	MW Impact
206306	28LKWD G1	8.98
206308	28LKWD G2	8.98
206312	28LKWD G3	6.33
206325	28O C GEN	310.52
206360	28O CRK C1	2.63
206361	28O CRK C2	1.69
206366	28LKWD CT1	17.02
206367	28LKWD CT2	17.02
227801	ONTC&DCT	5.46
227843	MARINGEN E	0.57
227928	V4-067E	0.23
292063	V1-021 E	0.03
292967	U2-045 E	2.46
293404	V3-036	0.78
902432	W2-030 E	0.86
905532	W4-063 E	0.62
915022	Y3-012 E	1.06
917612	Z2-102 E	0.83
924701	AB2-122 C	0.1
924702	AB2-122 E	0.17
930002	AB1-001 E	0.2
930891	AB1-138 C	1.11
930892	AB1-138 E	1.85
931122	AB1-163 E	0.58
933962	AD1-019 E	1.07
934351	AD1-059	1.6
938151	AE1-020 C O1	155.89
938152	AE1-020 E O1	398.88
938781	AE1-104 C O1	16.4
938782	AE1-104 E O1	41.94
939121	AE1-142 C O1	4.27
939122	AE1-142 E O1	6.14
BAYOU	BAYOU	0.28
BIG_CAJUN1	BIG_CAJUN1	0.43
BIG_CAJUN2	BIG_CAJUN2	0.87
BLUEG	BLUEG	1.4
CALDERWOOD	CALDERWOOD	0.14
CANNELTON	CANNELTON	0.08
CARR	CARR	0.55
CATAWBA	CATAWBA	0.09

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.13
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.29
COFFEEN	COFFEEN	0.15
COTTONWOOD	COTTONWOOD	1.12
DEARBORN	DEARBORN	0.26
DUCKCREEK	DUCKCREEK	0.32
EDWARDS	EDWARDS	0.15
ELMERSMITH	ELMERSMITH	0.14
FARMERCITY	FARMERCITY	0.1
G-007	G-007	5.95
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.28
NEWTON	NEWTON	0.38
O-066	O-066	7.67
PRAIRIE	PRAIRIE	0.71
RENSSELAER	RENSSELAER	0.44
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.18
TILTON	TILTON	0.18
TRIMBLE	TRIMBLE	0.16
TVA	TVA	0.47
UNIONPOWER	UNIONPOWER	0.21

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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
713683	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13A	breaker	869.0	120.22	121.44	DC	10.58

Bus #	Bus	MW Impact
206306	28LKWD G1	9.09
206308	28LKWD G2	9.09
206312	28LKWD G3	6.41
206325	28O C GEN	315.11
206360	28O CRK C1	2.67
206361	28O CRK C2	1.72
206366	28LKWD CT1	17.23
206367	28LKWD CT2	17.23
227801	ONTC&DCT	5.56
227843	MARINGEN E	0.58
227928	V4-067E	0.24
292063	V1-021 E	0.03
292967	U2-045 E	2.51
293404	V3-036	0.79
902432	W2-030 E	0.87
905532	W4-063 E	0.63
915022	Y3-012 E	1.08
917612	Z2-102 E	0.89
924701	AB2-122 C	0.1
924702	AB2-122 E	0.18
930002	AB1-001 E	0.21
930891	AB1-138 C	1.16
930892	AB1-138 E	1.93
931122	AB1-163 E	0.64
933962	AD1-019 E	1.09
934351	AD1-059	1.62
938151	AE1-020 C O1	158.19
938152	AE1-020 E O1	404.77
938781	AE1-104 C O1	16.71
938782	AE1-104 E O1	42.75
939121	AE1-142 C O1	4.34
939122	AE1-142 E O1	6.24
BAYOU	BAYOU	0.3
BIG_CAJUN1	BIG_CAJUN1	0.46
BIG_CAJUN2	BIG_CAJUN2	0.92
BLUEG	BLUEG	1.48
CALDERWOOD	CALDERWOOD	0.15
CANNELTON	CANNELTON	0.09
CARR	CARR	0.57
CATAWBA	CATAWBA	0.09

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.14
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.31
COFFEEN	COFFEEN	0.16
COTTONWOOD	COTTONWOOD	1.19
DEARBORN	DEARBORN	0.27
DUCKCREEK	DUCKCREEK	0.34
EDWARDS	EDWARDS	0.16
ELMERSMITH	ELMERSMITH	0.15
FARMERCITY	FARMERCITY	0.1
G-007	G-007	5.47
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.3
NEWTON	NEWTON	0.41
O-066	O-066	7.78
PRAIRIE	PRAIRIE	0.75
RENSSELAER	RENSSELAER	0.45
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.19
TILTON	TILTON	0.19
TRIMBLE	TRIMBLE	0.16
TVA	TVA	0.5
UNIONPOWER	UNIONPOWER	0.22

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Affected Systems

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LG&E

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

MISO

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

TVA

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

Duke Energy Progress

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

NYISO

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

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Contingency Definitions

Contingency Name	Contingency Definition
JC-P7-1-JCC-230-12	CONTINGENCY 'JC-P7-1-JCC-230-12' /* LEISURE VILLAGE-MANITOU A2027 & C2029 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206277 CKT 7 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206276 CKT 3 SET BUS 206296 LOAD TO 0 MW END
JC-P2-3-JCC-230-13D	CONTINGENCY 'JC-P2-3-JCC-230-13D' /* LARRABEE SE BUS & LARRABEE-LAKEWOOD (K2011) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 4 /* 28LARRABEE 230 28LARR AB 35 REMOVE SWSHUNT FROM BUS 206294 BLOCK 1 STEP 1 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 1 /* 28LARRABEE 230 28LAKEWOOD 230 END
JC-P7-1-JCC-230-10A	CONTINGENCY 'JC-P7-1-JCC-230-10A' /* LAKEWOOD - LARRABEE 230 KV LINES DISCONNECT BRANCH FROM BUS 206323 TO BUS 206294 CKT 2 DISCONNECT BRANCH FROM BUS 206323 TO BUS 206294 CKT 1 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 3 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* LARRABEE 12 FUTURE BREAKER AND A HALF SET BUS 206294 LOAD TO 38 MW /* LARRABEE 8 FUTURE BREAKER AND A HALF END
JC-P2-3-JCC-230-13B	CONTINGENCY 'JC-P2-3-JCC-230-13B' /* LARRABEE-LAKEWOOD (Z2026) & LARRABEE SE BUS 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* 28LARRABEE 230 28LARR CD 35 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 2 /* 28LARRABEE 230 28LAKEWOOD 230 REMOVE LOAD 8 FROM BUS 206294 /* 28LARRABEE 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 4 /* 28LARRABEE 230 28LARR AB 35 REMOVE SWSHUNT FROM BUS 206294 BLOCK 1 STEP 1 END
JC-P2-3-JCC-230-13A	CONTINGENCY 'JC-P2-3-JCC-230-13A' /* LARRABEE-SMITHBURG (D2004) & LARRABEE-LAKEWOOD (Z2026) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 /* 28LARRABEE 230 28SMITHBRG 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 2 /* 28LARRABEE 230 28LAKEWOOD 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* 28LARRABEE 230 28LARR CD 35 REMOVE LOAD 8 FROM BUS 206294 /* 28LARRABEE 230 END

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Contingency Name	Contingency Definition
JC-P2-3-JCC-230-13H	CONTINGENCY 'JC-P2-3-JCC-230-13H' /* LARRABEE-LAKEWOOD (K2011) & LARRABEE-SMITHBURG (H2008) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 1 /* 28LARRABEE 230 28LAKEWOOD 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 /* 28LARRABEE 230 28SMITHBRG 230 DISCONNECT BRANCH FROM BUS 200017 TO BUS 206309 CKT 4 /* SMITHBRG 500 28SMITHBRG 230 END
JC-P2-3-JCC-230-9A	CONTINGENCY 'JC-P2-3-JCC-230-9A' /* LAKEWOOD-LEISURE VILAGE(D2030) & LEISURE VILAGE-MANITOU(A2027) DISCONNECT BRANCH FROM BUS 206323 TO BUS 206295 CKT 1 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206276 CKT 4 SET BUS 206295 LOAD TO 0 MW DISCONNECT BRANCH FROM BUS 206297 TO BUS 206277 CKT 7 DISCONNECT BUS 206295 END
JC-P2-3-JCC-230-8A	CONTINGENCY 'JC-P2-3-JCC-230-8A' /* LAKEWOOD-LARRABEE (K2011) & LEISURE VILLAGE (D2030) 230 KV DISCONNECT BRANCH FROM BUS 206323 TO BUS 206295 CKT 1 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206276 CKT 4 SET BUS 206295 LOAD TO 0 MW DISCONNECT BRANCH FROM BUS 206323 TO BUS 206294 CKT 2 END
JC-P2-3-JCC-230-10A	CONTINGENCY 'JC-P2-3-JCC-230-10A' /* LAKEWOOD-LEISURE VILAGE(U2021) & LEISURE VILAGE-MANITOU(C2029) DISCONNECT BRANCH FROM BUS 206323 TO BUS 206296 CKT 1 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206323 TO BUS 206282 CKT 6 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206276 CKT 3 SET BUS 206296 LOAD TO 0 MW DISCONNECT BUS 206296 DISCONNECT BUS 206999 DISCONNECT BUS 207110 DISCONNECT BUS 207010 DISCONNECT BUS 207111 END

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Short Circuit

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Short Circuit

The following Breakers are overduty:

None.

Network Impacts – Option 2

The Queue Project AE1-142 was evaluated as a 20 MW (Capacity 8.2 MW) injection at the Three River Chemical O41 34.5 kV substation in the JCPL area. Project AE1-142 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-142 was studied with a commercial probability of 53%. Potential network impacts were as follows:

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Summer Peak Load Flow

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Generation Deliverability

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

None

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	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
702907	206319	28WHITINGS	JCPL	206720	28MANCHSTR	JCPL	1	JC-P7-1-JCC-230-12	tower	869.0	99.78	100.91	DC	9.74

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	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
701672	206297	28MANITOU	JCPL	206296	28LEISUR U	JCPL	1	JC-P2-3-JCC-230-9A	breaker	817.0	107.12	108.14	DC	8.4
701673	206297	28MANITOU	JCPL	206296	28LEISUR U	JCPL	1	JC-P2-3-JCC-230-11	breaker	817.0	105.24	106.29	DC	8.54
701685	206297	28MANITOU	JCPL	206295	28LEISUR D	JCPL	1	JC-P2-3-JCC-230-10A	breaker	817.0	105.95	107.01	DC	8.61
701686	206297	28MANITOU	JCPL	206295	28LEISUR D	JCPL	1	JC-P2-3-JCC-230-12	breaker	817.0	104.64	105.71	DC	8.77
702959	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	101.93	103.02	DC	6.14
702906	206319	28WHITINGS	JCPL	206720	28MANCHSTR	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	108.71	109.86	DC	9.98
701342	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13H	breaker	817.0	137.54	138.68	DC	9.33

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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
701343	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13D	breaker	817.0	137.13	138.32	DC	9.76
701443	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13B	breaker	869.0	127.66	128.79	DC	9.8
701444	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13A	breaker	869.0	127.13	128.22	DC	9.52
701446	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-7A	breaker	869.0	103.76	104.89	DC	9.76
702921	206720	28MANCHSTR	JCPL	206318	28VANHISVL	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	106.97	108.12	DC	9.98

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.

None

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Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

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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
702906	206319	28WHITINGS	JCPL	206720	28MANCHSTR	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	108.71	109.86	DC	9.98

Bus #	Bus	MW Impact
206306	28LKWD G1	7.06
206308	28LKWD G2	7.06
206312	28LKWD G3	4.98
206325	28O C GEN	312.94
206360	28O CRK C1	2.65
206361	28O CRK C2	1.71
206366	28LKWD CT1	13.38
206367	28LKWD CT2	13.38
227801	ONTC&DCT	5.26
227843	MARINGEN E	0.55
227928	V4-067E	0.23
292063	V1-021 E	0.03
292967	U2-045 E	2.37
293404	V3-036	0.75
902432	W2-030 E	0.83
905532	W4-063 E	0.59
915022	Y3-012 E	1.02
917612	Z2-102 E	0.76
924701	AB2-122 C	0.1
924702	AB2-122 E	0.17
930002	AB1-001 E	0.2
930891	AB1-138 C	1.34
930892	AB1-138 E	2.24
931122	AB1-163 E	0.78
933962	AD1-019 E	1.04
934351	AD1-059	1.26
938211	AE1-034 C O2	172.46
938212	AE1-034 E O2	441.28
938781	AE1-104 C O2	18.35
938782	AE1-104 E O2	46.94
939121	AE1-142 C O2	4.09
939122	AE1-142 E O2	5.89
BAYOU	BAYOU	0.25
BIG_CAJUN1	BIG_CAJUN1	0.39
BIG_CAJUN2	BIG_CAJUN2	0.79
BLUEG	BLUEG	1.25
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.08
CARR	CARR	0.39
CATAWBA	CATAWBA	0.08

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
CHOCTAW	CHOCTAW	0.26
COFFEEN	COFFEEN	0.13
COTTONWOOD	COTTONWOOD	1.01
DEARBORN	DEARBORN	0.23
DUCKCREEK	DUCKCREEK	0.29
EDWARDS	EDWARDS	0.13
ELMERSMITH	ELMERSMITH	0.13
FARMERCITY	FARMERCITY	0.09
G-007	G-007	3.18
GIBSON	GIBSON	0.05
HAMLET	HAMLET	0.26
NEWTON	NEWTON	0.34
O-066	O-066	5.15
PRAIRIE	PRAIRIE	0.64
RENSSELAER	RENSSELAER	0.31
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.16
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.14
TVA	TVA	0.42
UNIONPOWER	UNIONPOWER	0.19

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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
701672	206297	28MANITOU	JCPL	206296	28LEISUR U	JCPL	1	JC-P2-3-JCC-230-9A	breaker	817.0	107.12	108.14	DC	8.4

Bus #	Bus	MW Impact
206280	28LAKEHURS	0.44
206325	28O C GEN	308.0
206360	28O CRK C1	2.61
206361	28O CRK C2	1.68
227801	ONTC&DCT	5.51
227842	MARINGEN	0.08
227843	MARINGEN E	0.57
227927	V4-067C	0.02
227928	V4-067E	0.24
228014	PVILLEG	0.09
228712	V2-041E	0.2
292063	V1-021 E	0.03
292966	U2-045 C	0.06
292967	U2-045 E	2.49
293404	V3-036	0.79
901982	W1-119 E	1.03
901991	W1-120C	0.7
901992	W1-120E	1.15
902092	W1-130E	0.49
902432	W2-030 E	0.87
905531	W4-063 C	0.01
905532	W4-063 E	0.62
915022	Y3-012 E	1.07
917612	Z2-102 E	0.84
919662	AA2-048 E	0.5
919672	AA2-049 E	0.21
924531	AB2-102 C	18.26
924532	AB2-102 E	0.41
924701	AB2-122 C	0.1
924702	AB2-122 E	0.18
930001	AB1-001 C	0.02
930002	AB1-001 E	0.21
930891	AB1-138 C	0.74
930892	AB1-138 E	1.23
931122	AB1-163 E	0.37
931191	AB1-169A	43.85
933962	AD1-019 E	1.09
938211	AE1-034 C O2	169.88
938212	AE1-034 E O2	434.67
938301	AE1-045 C	0.16

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Bus #	Bus	MW Impact
938302	AE1-045 E	0.08
938311	AE1-046 C	0.16
938312	AE1-046 E	0.08
938421	AE1-061 C	0.21
938422	AE1-061 E	0.21
938781	AE1-104 C O2	19.29
938782	AE1-104 E O2	49.35
939121	AE1-142 C O2	3.44
939122	AE1-142 E O2	4.96
939501	AE1-179 C O2	2.49
939502	AE1-179 E O2	1.76
940001	AE1-240 C O2	2.12
940002	AE1-240 E O2	1.51
BAYOU	BAYOU	0.01
BIG_CAJUN1	BIG_CAJUN1	0.02
BIG_CAJUN2	BIG_CAJUN2	0.04
BLUEG	BLUEG	0.11
CALDERWOOD	CALDERWOOD	0.0
CANNELTON	CANNELTON	0.01
CARR	CARR	0.46
CBM-S2	CBM-S2	0.01
CHEOAH	CHEOAH	0.0
CHILHOWEE	CHILHOWEE	0.0
CHOCTAW	CHOCTAW	0.01
COFFEEN	COFFEEN	0.01
COTTONWOOD	COTTONWOOD	0.05
CPLE	CPLE	0.01
DEARBORN	DEARBORN	0.03
DUCKCREEK	DUCKCREEK	0.03
EDWARDS	EDWARDS	0.01
ELMERSMITH	ELMERSMITH	0.01
FARMERCITY	FARMERCITY	0.01
G-007	G-007	4.69
GIBSON	GIBSON	0.0
NEWTON	NEWTON	0.03
O-066	O-066	6.55
PRAIRIE	PRAIRIE	0.05
RENSSELAER	RENSSELAER	0.36
SANTEETLA	SANTEETLA	0.0
SMITHLAND	SMITHLAND	0.0
TATANKA	TATANKA	0.01
TILTON	TILTON	0.01
TRIMBLE	TRIMBLE	0.01
TVA	TVA	0.02
UNIONPOWER	UNIONPOWER	0.01

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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
701685	206297	28MANITOU	JCPL	206295	28LEISURD	JCPL	1	JC-P2-3-JCC-230-10A	breaker	817.0	105.95	107.01	DC	8.61

Bus #	Bus	MW Impact
206280	28LAKEHURS	0.45
206325	28O C GEN	307.95
206360	28O CRK C1	2.61
206361	28O CRK C2	1.68
227801	ONTC&DCT	5.51
227842	MARINGEN	0.08
227843	MARINGEN E	0.57
227927	V4-067C	0.02
227928	V4-067E	0.24
228014	PVILLEG	0.09
228712	V2-041E	0.2
292063	V1-021 E	0.03
292966	U2-045 C	0.06
292967	U2-045 E	2.49
293404	V3-036	0.79
901982	W1-119 E	1.04
901991	W1-120C	0.71
901992	W1-120E	1.16
902092	W1-130E	0.49
902432	W2-030 E	0.87
905531	W4-063 C	0.01
905532	W4-063 E	0.62
915022	Y3-012 E	1.07
917612	Z2-102 E	0.85
919662	AA2-048 E	0.5
919672	AA2-049 E	0.21
924531	AB2-102 C	18.26
924532	AB2-102 E	0.41
924701	AB2-122 C	0.1
924702	AB2-122 E	0.18
930001	AB1-001 C	0.02
930002	AB1-001 E	0.21
930891	AB1-138 C	0.75
930892	AB1-138 E	1.25
931122	AB1-163 E	0.38
931191	AB1-169A	43.85
933962	AD1-019 E	1.09
938211	AE1-034 C O2	169.85
938212	AE1-034 E O2	434.59
938301	AE1-045 C	0.16

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Bus #	Bus	MW Impact
938302	AE1-045 E	0.08
938311	AE1-046 C	0.16
938312	AE1-046 E	0.08
938421	AE1-061 C	0.21
938422	AE1-061 E	0.21
938781	AE1-104 C O2	19.29
938782	AE1-104 E O2	49.35
939121	AE1-142 C O2	3.53
939122	AE1-142 E O2	5.08
939501	AE1-179 C O2	2.49
939502	AE1-179 E O2	1.76
940001	AE1-240 C O2	2.12
940002	AE1-240 E O2	1.51
BAYOU	BAYOU	0.01
BIG_CAJUN1	BIG_CAJUN1	0.02
BIG_CAJUN2	BIG_CAJUN2	0.04
BLUEG	BLUEG	0.11
CALDERWOOD	CALDERWOOD	0.0
CANNELTON	CANNELTON	0.01
CARR	CARR	0.46
CBM-S2	CBM-S2	0.01
CHEOAH	CHEOAH	0.0
CHILHOWEE	CHILHOWEE	0.0
CHOCTAW	CHOCTAW	0.01
COFFEEN	COFFEEN	0.01
COTTONWOOD	COTTONWOOD	0.05
CPLE	CPLE	0.01
DEARBORN	DEARBORN	0.03
DUCKCREEK	DUCKCREEK	0.03
EDWARDS	EDWARDS	0.01
ELMERSMITH	ELMERSMITH	0.01
FARMERCITY	FARMERCITY	0.01
G-007	G-007	4.69
GIBSON	GIBSON	0.0
NEWTON	NEWTON	0.03
O-066	O-066	6.55
PRAIRIE	PRAIRIE	0.05
RENSSELAER	RENSSELAER	0.36
SANTEETLA	SANTEETLA	0.0
SMITHLAND	SMITHLAND	0.0
TATANKA	TATANKA	0.01
TILTON	TILTON	0.01
TRIMBLE	TRIMBLE	0.01
TVA	TVA	0.02
UNIONPOWER	UNIONPOWER	0.01

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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
702959	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	101.93	103.02	DC	6.14

Bus #	Bus	MW Impact
206306	28LKWD G1	4.39
206308	28LKWD G2	4.39
206312	28LKWD G3	3.1
206325	28O C GEN	248.45
206360	28O CRK C1	2.1
206361	28O CRK C2	1.35
206366	28LKWD CT1	8.32
206367	28LKWD CT2	8.32
901982	W1-119 E	1.23
901991	W1-120C	0.84
901992	W1-120E	1.37
902082	W1-129E	0.28
902322	W2-019 E	0.31
902952	W2-082 E OP1	0.95
903982	W3-079 E	0.43
905252	W4-025 E	0.4
907082	X1-037 E	0.69
912102	X4-015 E	0.28
912182	X4-031 E	0.14
914092	Y2-051 E	0.34
917612	Z2-102 E	0.95
918452	AA1-060 E	1.49
919662	AA2-048 E	0.69
930891	AB1-138 C	0.85
930892	AB1-138 E	1.42
931122	AB1-163 E	0.75
934351	AD1-059	0.78
938151	AE1-020 C O2	21.02
938152	AE1-020 E O2	53.78
938211	AE1-034 C O2	107.03
938212	AE1-034 E O2	273.86
938421	AE1-061 C	0.23
938422	AE1-061 E	0.23
939121	AE1-142 C O2	2.52
939122	AE1-142 E O2	3.62
BAYOU	BAYOU	0.08
BIG_CAJUN1	BIG_CAJUN1	0.12
BIG_CAJUN2	BIG_CAJUN2	0.24
BLUEG	BLUEG	0.33
CALDERWOOD	CALDERWOOD	0.04

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Bus #	Bus	MW Impact
CANNELTON	CANNELTON	0.02
CATAWBA	CATAWBA	0.03
CBM-N	CBM-N	0.69
CHEOAH	CHEOAH	0.04
CHILHOWEE	CHILHOWEE	0.01
CHOCTAW	CHOCTAW	0.08
COFFEEN	COFFEEN	0.04
COTTONWOOD	COTTONWOOD	0.31
DEARBORN	DEARBORN	0.05
DUCKCREEK	DUCKCREEK	0.07
EDWARDS	EDWARDS	0.03
ELMERSMITH	ELMERSMITH	0.04
FARMERCITY	FARMERCITY	0.02
G-007A	G-007A	8.07
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.11
NEWTON	NEWTON	0.09
NYISO	NYISO	3.0
O-066A	O-066A	1.57
PRAIRIE	PRAIRIE	0.18
SANTEETLA	SANTEETLA	0.01
SMITHLAND	SMITHLAND	0.01
TATANKA	TATANKA	0.04
TILTON	TILTON	0.04
TRIMBLE	TRIMBLE	0.04
TVA	TVA	0.13
UNIONPOWER	UNIONPOWER	0.06
VFT	VFT	8.95

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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
701343	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13D	breaker	817.0	137.13	138.32	DC	9.76

Bus #	Bus	MW Impact
206306	28LKWD G1	9.25
206308	28LKWD G2	9.25
206312	28LKWD G3	6.53
206325	28O C GEN	321.92
206360	28O CRK C1	2.73
206361	28O CRK C2	1.75
206366	28LKWD CT1	17.54
206367	28LKWD CT2	17.54
227801	ONTC&DCT	5.69
227843	MARINGEN E	0.59
227928	V4-067E	0.24
292063	V1-021 E	0.03
292967	U2-045 E	2.56
293404	V3-036	0.81
901982	W1-119 E	1.2
901991	W1-120C	0.82
901992	W1-120E	1.33
902432	W2-030 E	0.9
905532	W4-063 E	0.64
915022	Y3-012 E	1.11
917612	Z2-102 E	0.97
924701	AB2-122 C	0.11
924702	AB2-122 E	0.18
930002	AB1-001 E	0.21
930891	AB1-138 C	1.19
930892	AB1-138 E	1.99
931122	AB1-163 E	0.72
933962	AD1-019 E	1.12
934351	AD1-059	1.65
938211	AE1-034 C O2	177.58
938212	AE1-034 E O2	454.37
938781	AE1-104 C O2	19.89
938782	AE1-104 E O2	50.88
939121	AE1-142 C O2	4.0
939122	AE1-142 E O2	5.76
BAYOU	BAYOU	0.31
BIG_CAJUN1	BIG_CAJUN1	0.48
BIG_CAJUN2	BIG_CAJUN2	0.97
BLUEG	BLUEG	1.55
CALDERWOOD	CALDERWOOD	0.16

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Bus #	Bus	MW Impact
CANNELTON	CANNELTON	0.09
CARR	CARR	0.58
CATAWBA	CATAWBA	0.1
CHEOAH	CHEOAH	0.15
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.32
COFFEEN	COFFEEN	0.16
COTTONWOOD	COTTONWOOD	1.25
DEARBORN	DEARBORN	0.29
DUCKCREEK	DUCKCREEK	0.36
EDWARDS	EDWARDS	0.16
ELMERSMITH	ELMERSMITH	0.16
FARMERCITY	FARMERCITY	0.11
G-007	G-007	5.19
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.32
NEWTON	NEWTON	0.43
O-066	O-066	7.89
PRAIRIE	PRAIRIE	0.79
RENSSELAER	RENSSELAER	0.46
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.19
TILTON	TILTON	0.2
TRIMBLE	TRIMBLE	0.17
TVA	TVA	0.52
UNIONPOWER	UNIONPOWER	0.23

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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
701444	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13A	breaker	869.0	127.13	128.22	DC	9.52

Bus #	Bus	MW Impact
206306	28LKWD G1	9.09
206308	28LKWD G2	9.09
206312	28LKWD G3	6.41
206325	28O C GEN	315.11
206360	28O CRK C1	2.67
206361	28O CRK C2	1.72
206366	28LKWD CT1	17.23
206367	28LKWD CT2	17.23
227801	ONTC&DCT	5.56
227843	MARINGEN E	0.58
227928	V4-067E	0.24
292063	V1-021 E	0.03
292967	U2-045 E	2.51
293404	V3-036	0.79
902432	W2-030 E	0.87
905532	W4-063 E	0.63
915022	Y3-012 E	1.08
917612	Z2-102 E	0.89
924701	AB2-122 C	0.1
924702	AB2-122 E	0.18
930002	AB1-001 E	0.21
930891	AB1-138 C	1.16
930892	AB1-138 E	1.93
931122	AB1-163 E	0.64
933962	AD1-019 E	1.09
934351	AD1-059	1.62
938211	AE1-034 C O2	173.84
938212	AE1-034 E O2	444.81
938781	AE1-104 C O2	19.43
938782	AE1-104 E O2	49.7
939121	AE1-142 C O2	3.91
939122	AE1-142 E O2	5.62
BAYOU	BAYOU	0.3
BIG_CAJUN1	BIG_CAJUN1	0.46
BIG_CAJUN2	BIG_CAJUN2	0.92
BLUEG	BLUEG	1.48
CALDERWOOD	CALDERWOOD	0.15
CANNELTON	CANNELTON	0.09
CARR	CARR	0.57
CATAWBA	CATAWBA	0.09

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.14
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.31
COFFEEN	COFFEEN	0.16
COTTONWOOD	COTTONWOOD	1.19
DEARBORN	DEARBORN	0.27
DUCKCREEK	DUCKCREEK	0.34
EDWARDS	EDWARDS	0.16
ELMERSMITH	ELMERSMITH	0.15
FARMERCITY	FARMERCITY	0.1
G-007	G-007	5.47
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.3
NEWTON	NEWTON	0.41
O-066	O-066	7.78
PRAIRIE	PRAIRIE	0.75
RENSSELAER	RENSSELAER	0.45
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.19
TILTON	TILTON	0.19
TRIMBLE	TRIMBLE	0.16
TVA	TVA	0.5
UNIONPOWER	UNIONPOWER	0.22

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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
702921	206720	28MANCHSTR	JCPL	206318	28VANHISVL	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	106.97	108.12	DC	9.98

Bus #	Bus	MW Impact
206306	28LKWD G1	7.06
206308	28LKWD G2	7.06
206312	28LKWD G3	4.98
206325	28O C GEN	312.94
206360	28O CRK C1	2.65
206361	28O CRK C2	1.71
206366	28LKWD CT1	13.38
206367	28LKWD CT2	13.38
227801	ONTC&DCT	5.26
227843	MARINGEN E	0.55
227928	V4-067E	0.23
292063	V1-021 E	0.03
292967	U2-045 E	2.37
293404	V3-036	0.75
902432	W2-030 E	0.83
905532	W4-063 E	0.59
915022	Y3-012 E	1.02
917612	Z2-102 E	0.76
924701	AB2-122 C	0.1
924702	AB2-122 E	0.17
930002	AB1-001 E	0.2
930891	AB1-138 C	1.34
930892	AB1-138 E	2.24
931122	AB1-163 E	0.78
933962	AD1-019 E	1.04
934351	AD1-059	1.26
938211	AE1-034 C O2	172.46
938212	AE1-034 E O2	441.28
938781	AE1-104 C O2	18.35
938782	AE1-104 E O2	46.94
939121	AE1-142 C O2	4.09
939122	AE1-142 E O2	5.89
BAYOU	BAYOU	0.25
BIG_CAJUN1	BIG_CAJUN1	0.39
BIG_CAJUN2	BIG_CAJUN2	0.79
BLUEG	BLUEG	1.25
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.08
CARR	CARR	0.39
CATAWBA	CATAWBA	0.08

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Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
CHOCTAW	CHOCTAW	0.26
COFFEEN	COFFEEN	0.13
COTTONWOOD	COTTONWOOD	1.01
DEARBORN	DEARBORN	0.23
DUCKCREEK	DUCKCREEK	0.29
EDWARDS	EDWARDS	0.13
ELMERSMITH	ELMERSMITH	0.13
FARMERCITY	FARMERCITY	0.09
G-007	G-007	3.18
GIBSON	GIBSON	0.05
HAMLET	HAMLET	0.26
NEWTON	NEWTON	0.34
O-066	O-066	5.15
PRAIRIE	PRAIRIE	0.64
RENSSELAER	RENSSELAER	0.31
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.16
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.14
TVA	TVA	0.42
UNIONPOWER	UNIONPOWER	0.19

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Affected Systems

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LG&E

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

MISO

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

TVA

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

Duke Energy Progress

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

NYISO

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

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Contingency Definitions

Contingency Name	Contingency Definition
JC-P7-1-JCC-230-12	CONTINGENCY 'JC-P7-1-JCC-230-12' /* LEISURE VILLAGE-MANITOU A2027 & C2029 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206277 CKT 7 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206276 CKT 3 SET BUS 206296 LOAD TO 0 MW END
JC-P2-3-JCC-230-13D	CONTINGENCY 'JC-P2-3-JCC-230-13D' /* LARRABEE SE BUS & LARRABEE-LAKEWOOD (K2011) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 4 /* 28LARRABEE 230 28LARR AB 35 REMOVE SWSHUNT FROM BUS 206294 BLOCK 1 STEP 1 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 1 /* 28LARRABEE 230 28LAKEWOOD 230 END
JC-P7-1-JCC-230-10A	CONTINGENCY 'JC-P7-1-JCC-230-10A' /* LAKEWOOD - LARRABEE 230 KV LINES DISCONNECT BRANCH FROM BUS 206323 TO BUS 206294 CKT 2 DISCONNECT BRANCH FROM BUS 206323 TO BUS 206294 CKT 1 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 3 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* LARRABEE 12 FUTURE BREAKER AND A HALF SET BUS 206294 LOAD TO 38 MW /* LARRABEE 8 FUTURE BREAKER AND A HALF END
JC-P2-3-JCC-230-13B	CONTINGENCY 'JC-P2-3-JCC-230-13B' /* LARRABEE-LAKEWOOD (Z2026) & LARRABEE SE BUS 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* 28LARRABEE 230 28LARR CD 35 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 2 /* 28LARRABEE 230 28LAKEWOOD 230 REMOVE LOAD 8 FROM BUS 206294 /* 28LARRABEE 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 4 /* 28LARRABEE 230 28LARR AB 35 REMOVE SWSHUNT FROM BUS 206294 BLOCK 1 STEP 1 END
JC-P2-3-JCC-230-13A	CONTINGENCY 'JC-P2-3-JCC-230-13A' /* LARRABEE-SMITHBURG (D2004) & LARRABEE-LAKEWOOD (Z2026) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 /* 28LARRABEE 230 28SMITHBRG 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 2 /* 28LARRABEE 230 28LAKEWOOD 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* 28LARRABEE 230 28LARR CD 35 REMOVE LOAD 8 FROM BUS 206294 /* 28LARRABEE 230 END
JC-P2-3-JCC-230-11	CONTINGENCY 'JC-P2-3-JCC-230-11' /* LEISURE VILLAGE - MANITOU & MANITOU - OYSTER CRK 230 KV DISCONNECT BRANCH FROM BUS 206295 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 2 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206277 CKT 7 END

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Contingency Name	Contingency Definition
JC-P2-3-JCC-230-12	CONTINGENCY 'JC-P2-3-JCC-230-12' /* MANITOU - LEISURE VILLAGE (C2029) & OYSTER CK (N1028) 230 KV DISCONNECT BRANCH FROM BUS 206323 TO BUS 206296 CKT 1 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206276 CKT 3 SET BUS 206296 LOAD TO 0 MW DISCONNECT BUS 206296 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 1 END
JC-P2-3-JCC-230-9A	CONTINGENCY 'JC-P2-3-JCC-230-9A' /* LAKEWOOD-LEISURE VILAGE(D2030) & LEISURE VILAGE-MANITOU(A2027) DISCONNECT BRANCH FROM BUS 206323 TO BUS 206295 CKT 1 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206295 TO BUS 206276 CKT 4 SET BUS 206295 LOAD TO 0 MW DISCONNECT BRANCH FROM BUS 206297 TO BUS 206277 CKT 7 DISCONNECT BUS 206295 END
JC-P2-3-JCC-230-7A	CONTINGENCY 'JC-P2-3-JCC-230-7A' /* LAKEWOOD - LARRABEE (K2011) & OCEAN POWER PEAKING 230 KV DISCONNECT BRANCH FROM BUS 206323 TO BUS 206294 CKT 2 REMOVE MACHINE 1 FROM BUS 206366 REMOVE MACHINE 2 FROM BUS 206367 DISCONNECT BUS 206366 DISCONNECT BUS 206367 END
JC-P2-3-JCC-230-10A	CONTINGENCY 'JC-P2-3-JCC-230-10A' /* LAKEWOOD-LEISURE VILAGE(U2021) & LEISURE VILAGE-MANITOU(C2029) DISCONNECT BRANCH FROM BUS 206323 TO BUS 206296 CKT 1 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206297 CKT 1 DISCONNECT BRANCH FROM BUS 206323 TO BUS 206282 CKT 6 DISCONNECT BRANCH FROM BUS 206296 TO BUS 206276 CKT 3 SET BUS 206296 LOAD TO 0 MW DISCONNECT BUS 206296 DISCONNECT BUS 206999 DISCONNECT BUS 207110 DISCONNECT BUS 207010 DISCONNECT BUS 207111 END
JC-P2-3-JCC-230-13H	CONTINGENCY 'JC-P2-3-JCC-230-13H' /* LARRABEE-LAKEWOOD (K2011) & LARRABEE-SMITHBURG (H2008) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 1 /* 28LARRABEE 230 28LAKEWOOD 230 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 /* 28LARRABEE 230 28SMITHBRG 230 DISCONNECT BRANCH FROM BUS 200017 TO BUS 206309 CKT 4 /* SMITHBRG 500 28SMITHBRG 230 END

Short Circuit

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Short Circuit

The following Breakers are overduty

None.

Attachment 1 – One Line

Attachment 2 – Project Location

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