



**Generation Interconnection
Feasibility Study Report
for
Queue Project AE1-020
“OYSTER CREEK 230 KV”
309.1 MW Capacity / 1100 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).

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.

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.

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 way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

General

The Interconnection Customer (IC) has proposed a new offshore wind generating facility to be located off the coast of New Jersey. The installed facilities will have a total capability of **1100 MW** with **309.1 MW** of this output being recognized by PJM as Capacity. The proposed in-service date for this project is **June 1, 2023**. **This study does not imply a Jersey Central Power & Light (JCPL) commitment to this in-service date.**

Queue Number	AE1-020
Project Name	OYSTER CREEK 230 KV
Interconnection Customer	
State	None
County	Ocean
Transmission Owner	JCPL
MFO	1100
MWE	1100
MWC	309.1
Fuel	Offshore Wind
Basecase Study Year	2022

Point of Interconnection (POI)

Primary Point of Interconnection

The **AE1-020 “Oyster Creek 230 kV”** generation project will interconnect into the Oyster Creek 230 kV Substation, located in Ocean County, New Jersey, via a single interconnection point. The primary direct connection of this project will be accomplished by adding (2) 230 kV circuit breakers in a new breaker and a half string at Oyster Creek Substation. The POI will be at a JCPL installed deadend structure at the Oyster Creek yard. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the associated attachment facilities to the POI.

Attachment 1 shows a one-line diagram of the proposed primary direct connection (Option 1) of the (AE1-020) generation project to the Jersey Central Power & Light transmission systems. **Attachment 2** provides the proposed location for the project. 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 JCPL facilities required to be upgraded for the interconnection of the generation project and the associated cost estimate are shown in the Transmission Owner Scope of Work section.

Secondary Point of Interconnection

The IC requested that a secondary POI be reviewed for network impacts (Option 2). The secondary interconnection chosen was a single direct connection into the Larrabee 230 kV Substation, located in Monmouth County, New Jersey.

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.

Cost Summary

The AE1-020 project will be responsible for the following costs. These costs do not include CIAC Tax Gross-up:

Description	Total Cost
Attachment Facilities	\$0
Direct Connection Network Upgrade	\$0
Non Direct Connection Network Upgrades	\$2,067,300
Total Costs	\$2,067,300

In addition, the AE1-020 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	\$403,494,600

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

The transmission and substation costs given above exclude any applicable state or federal taxes. If at a future date Federal CIAC (contribution in aid of construction) taxes are deemed necessary by the IRS for this project, JPCL shall be reimbursed by the Interconnection Customer for such taxes.

The required Attachment Facilities, Direct Connection, and Non-Direct Connection work for the interconnection of the AE1-020 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 the Facilities Study. 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.

Transmission Owner Scope of Work

Attachment Facilities

The IC will be responsible for constructing the Attachment Facilities to the Point of Interconnection along with acquiring all easements, properties, and permits that may be required.

Direct Connection Cost Estimate

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

Non-Direct Connection Cost Estimate

To accommodate the proposed AE1-020 Project, JCPL will add (2) 230 kV circuit breakers in a new breaker and a half string at Oyster Creek Substation. The IC will be responsible for constructing the Attachment Facilities to the Point of Interconnection along with acquiring all easements, properties, and permits that may be required.

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
Oyster Creek Substation: Add (2) 230kV breakers in a new breaker and a half string for generation interconnection queue AE1-020 @ Oyster Creek SS.	\$2,067,300
Total Non-Direct Connection Facility Costs	\$2,067,300

Incremental Capacity Transfer Rights (ICTRs)

Will be determined at a later study phase.

Schedule

Based on the extent of the JCPL primary Non-Direct Connection work required to support the AE1-020 generation project, it is expected to take a minimum of **fifteen (15) 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. This assumes 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 direct connection and network upgrades, and that PJM will allow all transmission system outages when requested.

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 AE1-020 project contributes to overloads on the FE transmission system as shown in the Network Impacts Section of the report for Option 1. The estimated cost of system reinforcements necessary to mitigate these overloads are provided in the System Reinforcements section. At the Secondary POI, the AE1-020 project contributes to overloads on the FE transmission system as shown in the Network Impacts Section of the report for Option 2. 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 AE1-020 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 for the Primary POI. For the Secondary POI, the AE1-020 project results in newly overdutied circuit breakers on the FE transmission system and/or has a significant fault current contribution to existing overdutied breakers. The results of this analysis for the Primary POI are documented in the Network Impacts Section of the report under Short Circuit for Option 1. The results of the analysis for the Secondary POI are documented in the Network Impacts Section of the report under Short Circuit for Option 2. Cost estimates are not provided for the secondary POI.

Stability Analysis

PJM will be responsible for completing a dynamic stability analysis, 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.

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.

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 230 kV circuit breaker to protect the AE1-020 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 retail service agreement with the electric distribution company to serve the customer load supplied from the AE1-020 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.

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 Section 8 of Attachment O.

JCPL Requirements

The Interconnection Customer will be required to comply with all FE Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "FirstEnergy Requirements for Transmission Connected Facilities" document located at the following links:

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

Network Impacts- Option 1

The Queue Project AE1-020 was evaluated as a 1100 MW (Capacity 309.1 MW) injection at the Oyster Creek 230 kV substation in the JCPL area. Project AE1-020 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-020 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Load Flow- Option 1

Generation Deliverability

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

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
35846	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P1-2_#2LINE_LT	single	813.0	92.6	95.27	DC	47.56
35847	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P1-2_#2LINE	single	813.0	91.77	94.43	DC	47.56

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
36072	206297	28MANITOU	JCPL	206319	28WHITINGS	JCPL	1	JC-P7-1-JCC-230-10A	tower	817.0	47.8	116.19	DC	558.75
36073	206297	28MANITOU	JCPL	206319	28WHITINGS	JCPL	1	JC-P7-1-JCC-230-12	tower	817.0	35.17	107.71	DC	592.67
35057	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	1	JC-P2-3-JCC-230-11	breaker	817.0	75.1	165.18	DC	735.94
35061	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	2	JC-P2-3-JCC-230-18A	breaker	869.0	70.22	155.51	DC	741.21
35062	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	2	JC-P2-3-JCC-230-12	breaker	869.0	70.7	155.41	DC	736.13
36041	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-13	tower	564.0	10.18	170.14	DC	1017.03
36042	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	28.94	107.74	DC	443.88
35258	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P2-3_LNEPS_P1-2_2_LT	breaker	813.0	91.49	101.14	DC	169.26
35348	206305	28RAR RVR	JCPL	218332	KILMER_W	PSE&G	1	PS_P2-3_LNEPS_P1-2_1_LT	breaker	817.0	86.39	93.62	DC	127.64
35231	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26B	breaker	869.0	97.71	106.76	DC	172.0
35232	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-81	breaker	869.0	91.67	98.75	DC	133.9
35233	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-026A	breaker	869.0	84.47	93.56	DC	172.8
35218	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-85	breaker	869.0	96.62	103.56	DC	131.0
35219	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-026C	breaker	869.0	88.78	97.83	DC	171.88
35220	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-20_A	breaker	869.0	83.74	92.74	DC	170.82
36097	206318	28VANHISVL	JCPL	206294	28LARRABEE	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	58.8	105.75	DC	407.96
35197	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13H	breaker	817.0	58.63	126.54	DC	554.85
35198	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13D	breaker	817.0	55.23	125.64	DC	575.22
35235	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13B	breaker	869.0	50.6	116.85	DC	575.71
35236	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13A	breaker	869.0	51.79	116.58	DC	563.05
35237	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-8A	breaker	869.0	55.58	113.17	DC	500.41

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
35217	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26D	breaker	869.0	101.96	110.98	DC	171.08

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	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
35832	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	1	Base Case	operation	650.0	51.73	114.78	DC	409.82
35833	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	1	AE_P1-2 OYCK-CEDAR	operation	817.0	34.22	100.73	DC	543.41
35911	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	2	Base Case	operation	709.0	47.49	105.36	DC	410.32
35842	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P1-2_#2LINE_LT	operation	813.0	90.9	100.55	DC	169.26
35905	218331	KILMER_I	PSE&G	218333	LNELSN_I	PSE&G	1	PS_P1-2_#2LINE	operation	805.0	84.79	94.53	DC	169.26
35877	218332	KILMER_W	PSE&G	218334	LNELSN_W	PSE&G	1	PS_P1-2_#1LINE	operation	679.0	90.2	98.92	DC	127.9

System Reinforcements¹

ID	Index	Facility	Upgrade Description	Cost
35061,35062	4	28OYSTER C 230.0 kV - 28MANITOU 230.0 kV Ckt 2	JCPL Description : Reconductor with 2-bundle 1590 45/7 MCM ACSR, and upgrade all equipment on line to match or exceed 2667 MVA STE rating. Additionally, upgrade relays & metering at both Manitou and Oyster Creek. Time Estimate : 31.0 Months Cost : \$13,501,500	\$13,501,500
35057	3	28OYSTER C 230.0 kV - 28MANITOU 230.0 kV Ckt 1	JCPL Description : Reconductor with 2-bundle 1590 45/7 MCM ACSR, and upgrade all equipment on line to match or exceed 2667 MVA STE rating. Additionally, upgrade relays & metering at both Manitou and Oyster Creek. Time Estimate : 31.0 Months Cost : \$106,343,200	\$106,343,200
35235,35236,35237	11	28LAKEWOOD 230.0 kV - 28LARRABEE 230.0 kV Ckt 1	JCPL Description : Reconductor with 1590 45/7 MCM ACSS, and upgrade all equipment on line to match or exceed 1334 MVA STE rating. Time Estimate : 19.0 Months Cost : \$17,442,500	\$17,442,500
35197,35198	10	28LAKEWOOD 230.0 kV - 28LARRABEE 230.0 kV Ckt 2	JCPL Description : Reconductor with 1590 45/7 MCM ACSS, and upgrade all equipment on line to match or exceed 1334 MVA STE Rating. Time Estimate : 19.0 Months Cost : \$7,692,500	\$7,692,500
35217,35218,35219, 35220	8	28RED OAKB 230.0 kV - 28RAR RVR 230.0 kV Ckt 1	JCPL Description : Reconductor the transmission line between Red Oak - Raritan River - South River Junction G1047 with 1590 45/7 MCM ACSS, and upgrade all terminal equipment at both stations to match or exceed 1334 MVA STE Rating. Also upgrade substation conductor at Red Oak. Time Estimate : 24.0 Months Cost : \$9,685,500	\$9,685,500
36097	9	28VANHISVL 230.0 kV - 28LARRABEE 230.0 kV Ckt 1	JCPL Description : Reconductor the transmission line between Larrabee - Van Hiseville tap - Manchester - Whittings with 1590 45/7 MCM ACSS. Upgrade wave traps at Larrabee & Whittings to match or exceed 1334 MVA STE Rating. Time Estimate : 31.0 Months Cost : \$93,163,200	\$93,163,200

¹ JCPL cost estimates presented in this System Reinforcements section include tax gross-up. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129.

ID	Index	Facility	Upgrade Description	Cost
36041,36042	5	28OYSTER C 230.0 kV - CEDAR 230.0 kV Ckt 1	<u>AE</u> Description : To mitigate the (ACE) OYSTER-CEDAR 230 kV line (from bus 206302 to bus 227955 ckt 1) overload, it will require increasing the emergency rating of the Oyster to Cedar 230 kV line by rebuilding the circuit. The rebuild will include the installation of new poles, foundations, insulators, and conductor. It will also require a couple of terminal equipment upgrades. Time Estimate : 48-60 Months Cost : \$27,000,000 <u>JCPL</u> Description : Reconductor with 1590 45/7 MCM ACSS. Time Estimate : 8.0 Months Cost : \$285,300	\$27,285,300
35348	6	28RAR RVR 230.0 kV - KILMER_W 230.0 kV Ckt 1	<u>PSE&G</u> Description : No Violation. Facility loading does not exceed 100%.	\$0
36072,36073	2	28MANITOU 230.0 kV - 28WHITINGS 230.0 kV Ckt 1	<u>JCPL</u> Description : Reconductor with 1590 45/7 MCM ACSS, and upgrade all equipment on line to match or exceed 1334 MVA STE rating. Time Estimate : 24.0 Months Cost : \$95,038,900	\$95,038,900
35258,35846,35847	1	28RAR RVR 230.0 kV - KILMER_I 230.0 kV Ckt 1	<u>PSE&G</u> Description: No Violation. PSE&G Terminal Equipment is Not Limiting Component. <u>JCPL</u> Description : Reconductor with 1590 45/7 MCM ACSS and upgrade equipment at on line to match or exceed 1334 MVA STE rating. Time Estimate : 17.0 Months Cost : \$18,844,500	\$18,844,500
35232,35233,35231	7	28RED OAKA 230.0 kV - 28RAR RVR 230.0 kV Ckt 1	<u>JCPL</u> Description : Reconductor the transmission line between Red Oak - Raritan River - South River Junction T1034 with 1590 45/7 MCM ACSS, and upgrade all terminal equipment at both stations to match or exceed 1334 MVA STE Rating. Also upgrade substation conductor at Red Oak. Time Estimate : 12.0 Months Cost : \$14,497,500	\$14,497,500
			TOTAL COST	\$403,494,600

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.

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
35258	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P2-3_LNEPS_P1-2_2_LT	breaker	813.0	91.49	101.14	DC	169.26

Bus #	Bus	MW Impact
206325	28O C GEN	94.74
206329	28S RIV G3	8.16
206350	28RRCT1&2	7.4
206351	28RRCT3&4	6.93
206362	28RDOAKCT1	14.91
206363	28RDOAKCT2	14.88
206364	28RDOAKCT3	14.88
206365	28RDOAKST1	20.9
206403	28W4-009	64.6
206412	28R11	212.96
901032	W1-024E OP1	0.46
901112	W1-032 E OP1	0.28
901422	W1-113 E	0.85
901912	W1-112E OP1	0.83
901982	W1-119 E	1.46
901991	W1-120C	1.0
901992	W1-120E	1.63
902032	W1-124E	3.45
902082	W1-129E	0.39
902322	W2-019 E	0.47
902912	W2-078 E	1.05
902952	W2-082 E OP1	1.34
903982	W3-079 E	0.86
905252	W4-025 E	0.56
905502	W4-060 E OP1	2.39
907082	X1-037 E	2.45
907272	X1-085 E	0.41
912102	X4-015 E	0.39
912182	X4-031 E	0.5
914092	Y2-051 E	0.6
917612	Z2-102 E	1.07
917682	Z2-109 E	9.68
918452	AA1-060 E	2.56
919662	AA2-048 E	1.37
919672	AA2-049 E	0.84
920732	AA2-184 E	5.61
924852	AB2-139 E	0.08
927132	AC1-207 E	1.67
930891	AB1-138 C	0.61
930892	AB1-138 E	1.02

Bus #	Bus	MW Impact
931122	AB1-163 E	0.84
934032	AD1-028 E	0.07
934841	AD1-113	18.12
937261	AD2-165	19.36
938151	AE1-020 C O1	47.56
938152	AE1-020 E O1	121.7
938211	AE1-034 C O1	57.3
938212	AE1-034 E O1	146.62
BAYOU	BAYOU	0.7
BIG_CAJUN1	BIG_CAJUN1	1.08
BIG_CAJUN2	BIG_CAJUN2	2.18
BLUEG	BLUEG	3.44
CALDERWOOD	CALDERWOOD	0.36
CANNELTON	CANNELTON	0.21
CARR	CARR	1.13
CATAWBA	CATAWBA	0.23
CHEOAH	CHEOAH	0.33
CHILHOWEE	CHILHOWEE	0.12
CHOCTAW	CHOCTAW	0.72
COFFEEN	COFFEEN	0.36
COTTONWOOD	COTTONWOOD	2.79
DEARBORN	DEARBORN	0.62
DUCKCREEK	DUCKCREEK	0.79
EDWARDS	EDWARDS	0.36
ELMERSMITH	ELMERSMITH	0.36
FARMERCITY	FARMERCITY	0.24
G-007A	G-007A	124.08
GIBSON	GIBSON	0.14
HAMLET	HAMLET	0.73
NEWTON	NEWTON	0.95
O-066	O-066	17.66
PRAIRIE	PRAIRIE	1.76
RENSSELAER	RENSSELAER	0.9
SANTEETLA	SANTEETLA	0.1
SMITHLAND	SMITHLAND	0.14
TATANKA	TATANKA	0.43
TILTON	TILTON	0.43
TRIMBLE	TRIMBLE	0.38
TVA	TVA	1.17
UNIONPOWER	UNIONPOWER	0.52

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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
36072	206297	28MANITOU	JCPL	206319	28WHITINGS	JCPL	1	JC-P7-1-JCC-230-10A	tower	817.0	47.8	116.19	DC	558.75

Bus #	Bus	MW Impact
206306	28LKWD G1	7.98
206308	28LKWD G2	7.98
206312	28LKWD G3	5.93
206325	28O C GEN	312.74
206360	28O CRK C1	2.97
206361	28O CRK C2	2.02
206366	28LKWD CT1	15.13
206367	28LKWD CT2	15.13
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	1.43
938151	AE1-020 C O1	157.01
938152	AE1-020 E O1	401.74
BAYOU	BAYOU	0.25
BIG_CAJUN1	BIG_CAJUN1	0.38
BIG_CAJUN2	BIG_CAJUN2	0.76
BLUEG	BLUEG	1.21
CALDERWOOD	CALDERWOOD	0.13
CANNELTON	CANNELTON	0.07
CARR	CARR	0.38
CATAWBA	CATAWBA	0.08
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
CHOCTAW	CHOCTAW	0.25
COFFEEN	COFFEEN	0.13
COTTONWOOD	COTTONWOOD	0.97
DEARBORN	DEARBORN	0.22

Bus #	Bus	MW Impact
DUCKCREEK	DUCKCREEK	0.28
EDWARDS	EDWARDS	0.13
ELMERSMITH	ELMERSMITH	0.13
FARMERCITY	FARMERCITY	0.08
G-007	G-007	3.14
GIBSON	GIBSON	0.05
HAMLET	HAMLET	0.25
NEWTON	NEWTON	0.33
O-066	O-066	5.08
PRAIRIE	PRAIRIE	0.62
RENSSELAER	RENSSELAER	0.3
SANTEETLA	SANTEETLA	0.03
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.15
TILTON	TILTON	0.15
TRIMBLE	TRIMBLE	0.13
TVA	TVA	0.41
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
35057	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	1	JC-P2-3-JCC-230-11	breaker	817.0	75.1	165.18	DC	735.94

Bus #	Bus	MW Impact
206325	28O C GEN	411.93
206360	28O CRK C1	3.92
206361	28O CRK C2	2.66
227801	ONTC&DCT	7.09
227842	MARINGEN	0.12
227843	MARINGEN E	0.73
227927	V4-067C	0.03
227928	V4-067E	0.31
228014	PVILLEG	0.13
228261	V4-054E	0.47
228712	V2-041E	0.25
292063	V1-021 E	0.04
292966	U2-045 C	0.08
292967	U2-045 E	3.2
293404	V3-036	1.01
902092	W1-130E	0.6
902432	W2-030 E	1.12
905531	W4-063 C	0.02
905532	W4-063 E	0.8
915022	Y3-012 E	1.38
919662	AA2-048 E	0.6
924531	AB2-102 C	22.67
924532	AB2-102 E	0.5
924701	AB2-122 C	0.13
924702	AB2-122 E	0.23
930001	AB1-001 C	0.03
930002	AB1-001 E	0.26
931191	AB1-169A	53.64
933962	AD1-019 E	1.4
938151	AE1-020 C O1	206.8
938152	AE1-020 E O1	529.14
938301	AE1-045 C	0.2
938302	AE1-045 E	0.1
938311	AE1-046 C	0.2
938312	AE1-046 E	0.1
938421	AE1-061 C	0.26
938422	AE1-061 E	0.26
BAYOU	BAYOU	0.05
BIG_CAJUN1	BIG_CAJUN1	0.07
BIG_CAJUN2	BIG_CAJUN2	0.14

Bus #	Bus	MW Impact
BLUEG	BLUEG	0.28
CALDERWOOD	CALDERWOOD	0.02
CANNELTON	CANNELTON	0.02
CARR	CARR	0.46
CATAWBA	CATAWBA	0.01
CHEOAH	CHEOAH	0.02
CHILHOWEE	CHILHOWEE	0.01
CHOCTAW	CHOCTAW	0.05
COFFEEN	COFFEEN	0.03
COTTONWOOD	COTTONWOOD	0.19
DEARBORN	DEARBORN	0.06
DUCKCREEK	DUCKCREEK	0.06
EDWARDS	EDWARDS	0.03
ELMERSMITH	ELMERSMITH	0.03
FARMERCITY	FARMERCITY	0.02
G-007	G-007	4.52
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.02
NEWTON	NEWTON	0.07
O-066	O-066	6.56
PRAIRIE	PRAIRIE	0.13
RENSSELAER	RENSSELAER	0.37
SANTEETLA	SANTEETLA	0.01
SMITHLAND	SMITHLAND	0.01
TATANKA	TATANKA	0.03
TILTON	TILTON	0.04
TRIMBLE	TRIMBLE	0.03
TVA	TVA	0.08
UNIONPOWER	UNIONPOWER	0.03

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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
35062	206302	28OYSTER C	JCPL	206297	28MANITOU	JCPL	2	JC-P2-3-JCC-230-12	breaker	869.0	70.7	155.41	DC	736.13

Bus #	Bus	MW Impact
206325	28O C GEN	412.03
206360	28O CRK C1	3.92
206361	28O CRK C2	2.66
227801	ONTC&DCT	7.09
227842	MARINGEN	0.12
227843	MARINGEN E	0.74
227927	V4-067C	0.03
227928	V4-067E	0.31
228014	PVILLEG	0.13
228261	V4-054E	0.47
228712	V2-041E	0.25
292063	V1-021 E	0.04
292966	U2-045 C	0.08
292967	U2-045 E	3.2
293404	V3-036	1.01
902092	W1-130E	0.6
902432	W2-030 E	1.12
905531	W4-063 C	0.02
905532	W4-063 E	0.8
915022	Y3-012 E	1.38
919662	AA2-048 E	0.6
924531	AB2-102 C	22.68
924532	AB2-102 E	0.5
924701	AB2-122 C	0.13
924702	AB2-122 E	0.23
930001	AB1-001 C	0.03
930002	AB1-001 E	0.26
931191	AB1-169A	53.65
933962	AD1-019 E	1.4
938151	AE1-020 C O1	206.85
938152	AE1-020 E O1	529.28
938301	AE1-045 C	0.2
938302	AE1-045 E	0.1
938311	AE1-046 C	0.2
938312	AE1-046 E	0.1
938421	AE1-061 C	0.26
938422	AE1-061 E	0.26
BAYOU	BAYOU	0.05
BIG_CAJUN1	BIG_CAJUN1	0.07
BIG_CAJUN2	BIG_CAJUN2	0.14

Bus #	Bus	MW Impact
BLUEG	BLUEG	0.28
CALDERWOOD	CALDERWOOD	0.02
CANNELTON	CANNELTON	0.02
CARR	CARR	0.46
CATAWBA	CATAWBA	0.01
CHEOAH	CHEOAH	0.02
CHILHOWEE	CHILHOWEE	0.01
CHOCTAW	CHOCTAW	0.05
COFFEEN	COFFEEN	0.03
COTTONWOOD	COTTONWOOD	0.19
DEARBORN	DEARBORN	0.06
DUCKCREEK	DUCKCREEK	0.06
EDWARDS	EDWARDS	0.03
ELMERSMITH	ELMERSMITH	0.03
FARMERCITY	FARMERCITY	0.02
G-007	G-007	4.52
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.02
NEWTON	NEWTON	0.07
O-066	O-066	6.56
PRAIRIE	PRAIRIE	0.13
RENSSELAER	RENSSELAER	0.37
SANTEETLA	SANTEETLA	0.01
SMITHLAND	SMITHLAND	0.01
TATANKA	TATANKA	0.03
TILTON	TILTON	0.04
TRIMBLE	TRIMBLE	0.03
TVA	TVA	0.08
UNIONPOWER	UNIONPOWER	0.03

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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
36041	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-13	tower	564.0	10.18	170.14	DC	1017.03

Bus #	Bus	MW Impact
206360	28O CRK C1	5.41
206361	28O CRK C2	3.67
938151	AE1-020 C O1	285.78
938152	AE1-020 E O1	731.24
BAYOU	BAYOU	0.03
BIG_CAJUN1	BIG_CAJUN1	0.05
BIG_CAJUN2	BIG_CAJUN2	0.1
BLUEG	BLUEG	0.15
CALDERWOOD	CALDERWOOD	0.02
CANNELTON	CANNELTON	0.01
CATAWBA	CATAWBA	0.01
CBM-N	CBM-N	0.08
CHEOAH	CHEOAH	0.01
CHILHOWEE	CHILHOWEE	0.01
CHOCTAW	CHOCTAW	0.03
COFFEEN	COFFEEN	0.02
COTTONWOOD	COTTONWOOD	0.13
DEARBORN	DEARBORN	0.02
DUCKCREEK	DUCKCREEK	0.03
EDWARDS	EDWARDS	0.02
ELMERSMITH	ELMERSMITH	0.02
FARMERCITY	FARMERCITY	0.01
G-007A	G-007A	1.04
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.04
NEWTON	NEWTON	0.04
NYISO	NYISO	0.34
O-066A	O-066A	0.19
PRAIRIE	PRAIRIE	0.07
SANTEETLA	SANTEETLA	0.0
SMITHLAND	SMITHLAND	0.01
TATANKA	TATANKA	0.02
TILTON	TILTON	0.02
TRIMBLE	TRIMBLE	0.02
TVA	TVA	0.05
UNIONPOWER	UNIONPOWER	0.02
VFT	VFT	1.07

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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
35348	206305	28RAR RVR	JCPL	218332	KILMER_W	PSE&G	1	PS_P2-3_LNEPS_P1-2_1_LT	breaker	817.0	86.39	93.62	DC	127.64

Bus #	Bus	MW Impact
206325	28O C GEN	71.45
206329	28S RIV G3	5.98
206350	28RRCT1&2	5.41
206351	28RRCT3&4	5.07
206362	28RDOAKCT1	10.92
206363	28RDOAKCT2	10.89
206364	28RDOAKCT3	10.89
206365	28RDOAKST1	15.3
206403	28W4-009	47.26
206412	28R11	155.95
901032	W1-024E OP1	0.35
901112	W1-032 E OP1	0.21
901422	W1-113 E	0.64
901912	W1-112E OP1	0.62
901982	W1-119 E	1.11
901991	W1-120C	0.76
901992	W1-120E	1.23
902032	W1-124E	2.56
902082	W1-129E	0.3
902322	W2-019 E	0.35
902912	W2-078 E	0.79
902952	W2-082 E OP1	1.02
903982	W3-079 E	0.65
905252	W4-025 E	0.43
905502	W4-060 E OP1	1.76
907082	X1-037 E	1.82
907272	X1-085 E	0.31
912102	X4-015 E	0.3
912182	X4-031 E	0.37
914092	Y2-051 E	0.45
917612	Z2-102 E	0.81
917682	Z2-109 E	7.09
918452	AA1-060 E	1.95
919662	AA2-048 E	1.03
919672	AA2-049 E	0.62
920732	AA2-184 E	4.15
924852	AB2-139 E	0.06
927132	AC1-207 E	1.25
930891	AB1-138 C	0.46
930892	AB1-138 E	0.77

Bus #	Bus	MW Impact
931122	AB1-163 E	0.63
934032	AD1-028 E	0.05
934841	AD1-113	13.25
937261	AD2-165	14.18
937512	AD2-210 E	0.18
938151	AE1-020 C O1	35.87
938152	AE1-020 E O1	91.78
938211	AE1-034 C O1	42.97
938212	AE1-034 E O1	109.96
BAYOU	BAYOU	0.42
BIG_CAJUN1	BIG_CAJUN1	0.65
BIG_CAJUN2	BIG_CAJUN2	1.3
BLUEG	BLUEG	2.09
CALDERWOOD	CALDERWOOD	0.22
CANNELTON	CANNELTON	0.13
CARR	CARR	1.23
CATAWBA	CATAWBA	0.13
CHEOAH	CHEOAH	0.2
CHILHOWEE	CHILHOWEE	0.07
CHOCTAW	CHOCTAW	0.43
COFFEEN	COFFEEN	0.22
COTTONWOOD	COTTONWOOD	1.67
DEARBORN	DEARBORN	0.39
DUCKCREEK	DUCKCREEK	0.48
EDWARDS	EDWARDS	0.22
ELMERSMITH	ELMERSMITH	0.22
FARMERCITY	FARMERCITY	0.14
G-007A	G-007A	90.78
GIBSON	GIBSON	0.09
HAMLET	HAMLET	0.42
NEWTON	NEWTON	0.57
O-066	O-066	22.64
PRAIRIE	PRAIRIE	1.06
RENSSELAER	RENSSELAER	0.97
SANTEETLA	SANTEETLA	0.06
SMITHLAND	SMITHLAND	0.08
TATANKA	TATANKA	0.26
TILTON	TILTON	0.26
TRIMBLE	TRIMBLE	0.23
TVA	TVA	0.7
UNIONPOWER	UNIONPOWER	0.31

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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
35231	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26B	breaker	869.0	97.71	106.76	DC	172.0

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.35
206325	28O C GEN	96.27
206327	28S RIV G1	7.85
206328	28S RIV G2	7.85
206329	28S RIV G3	10.35
206358	28PARLN1&2	4.71
206359	28PARLN3&4	5.65
206363	28RDOAKCT2	19.18
206364	28RDOAKCT3	19.18
206412	28R11	269.92
207144	28HOW_X1-037	0.23
207204	28HOL_W1-112	0.08
207206	28TIN_W1-124	0.39
901112	W1-032 E OP1	0.2
901912	W1-112E OP1	0.76
901982	W1-119 E	1.41
901991	W1-120C	0.96
901992	W1-120E	1.57
902032	W1-124E	3.66
902082	W1-129E	0.38
902322	W2-019 E	0.45
902952	W2-082 E OP1	1.28
903981	W3-079 C	0.09
903982	W3-079 E	0.88
905252	W4-025 E	0.54
907082	X1-037 E	2.16
912102	X4-015 E	0.38
912182	X4-031 E	0.51
914092	Y2-051 E	0.61
917612	Z2-102 E	1.03
917682	Z2-109 E	12.27
919662	AA2-048 E	1.39
919672	AA2-049 E	0.89
920732	AA2-184 E	5.92
925541	AC1-029	2.11
930891	AB1-138 C	0.62
930892	AB1-138 E	1.03
931122	AB1-163 E	0.84
934032	AD1-028 E	0.03
937261	AD2-165	24.54

Bus #	Bus	MW Impact
938151	AE1-020 C O1	48.33
938152	AE1-020 E O1	123.67
938211	AE1-034 C O1	58.15
938212	AE1-034 E O1	148.79
BAYOU	BAYOU	0.3
BIG_CAJUN1	BIG_CAJUN1	0.45
BIG_CAJUN2	BIG_CAJUN2	0.91
BLUEG	BLUEG	1.49
CALDERWOOD	CALDERWOOD	0.15
CANNELTON	CANNELTON	0.09
CARR	CARR	1.04
CATAWBA	CATAWBA	0.09
CHEOAH	CHEOAH	0.14
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.3
COFFEEN	COFFEEN	0.16
COTTONWOOD	COTTONWOOD	1.18
DEARBORN	DEARBORN	0.28
DUCKCREEK	DUCKCREEK	0.35
EDWARDS	EDWARDS	0.16
ELMERSMITH	ELMERSMITH	0.15
FARMERCITY	FARMERCITY	0.1
G-007	G-007	30.11
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.28
NEWTON	NEWTON	0.41
O-066	O-066	17.86
PRAIRIE	PRAIRIE	0.76
RENSSELAER	RENSSELAER	0.82
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.19
TILTON	TILTON	0.19
TRIMBLE	TRIMBLE	0.17
TVA	TVA	0.49
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
35217	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26D	breaker	869.0	101.96	110.98	DC	171.08

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.35
206325	28O C GEN	95.76
206327	28S RIV G1	7.69
206328	28S RIV G2	7.69
206329	28S RIV G3	10.13
206358	28PARLN1&2	4.78
206359	28PARLN3&4	5.73
206362	28RDOAKCT1	19.22
206365	28RDOAKST1	26.94
206412	28R11	264.32
207144	28HOW_X1-037	0.23
207204	28HOL_W1-112	0.08
207206	28TIN_W1-124	0.38
901112	W1-032 E OP1	0.2
901912	W1-112E OP1	0.76
901982	W1-119 E	1.41
901991	W1-120C	0.96
901992	W1-120E	1.56
902032	W1-124E	3.65
902082	W1-129E	0.38
902322	W2-019 E	0.44
902952	W2-082 E OP1	1.28
903981	W3-079 C	0.09
903982	W3-079 E	0.87
905252	W4-025 E	0.53
907082	X1-037 E	2.15
912102	X4-015 E	0.38
912182	X4-031 E	0.51
914092	Y2-051 E	0.61
917612	Z2-102 E	1.03
917682	Z2-109 E	12.01
918452	AA1-060 E	2.12
919662	AA2-048 E	1.39
919672	AA2-049 E	0.88
920732	AA2-184 E	5.9
925541	AC1-029	2.07
930891	AB1-138 C	0.62
930892	AB1-138 E	1.03
931122	AB1-163 E	0.83
934032	AD1-028 E	0.03

Bus #	Bus	MW Impact
937261	AD2-165	24.03
938151	AE1-020 C O1	48.07
938152	AE1-020 E O1	123.01
938211	AE1-034 C O1	57.86
938212	AE1-034 E O1	148.04
BAYOU	BAYOU	0.32
BIG_CAJUN1	BIG_CAJUN1	0.49
BIG_CAJUN2	BIG_CAJUN2	0.99
BLUEG	BLUEG	1.61
CALDERWOOD	CALDERWOOD	0.16
CANNELTON	CANNELTON	0.1
CARR	CARR	1.04
CATAWBA	CATAWBA	0.1
CHEOAH	CHEOAH	0.15
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.33
COFFEEN	COFFEEN	0.17
COTTONWOOD	COTTONWOOD	1.27
DEARBORN	DEARBORN	0.3
DUCKCREEK	DUCKCREEK	0.37
EDWARDS	EDWARDS	0.17
ELMERSMITH	ELMERSMITH	0.17
FARMERCITY	FARMERCITY	0.11
G-007	G-007	30.03
GIBSON	GIBSON	0.07
HAMLET	HAMLET	0.31
NEWTON	NEWTON	0.44
O-066	O-066	17.88
PRAIRIE	PRAIRIE	0.82
RENSSELAER	RENSSELAER	0.82
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.2
TILTON	TILTON	0.2
TRIMBLE	TRIMBLE	0.18
TVA	TVA	0.53
UNIONPOWER	UNIONPOWER	0.24

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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
36097	206318	28VANHISVL	JCPL	206294	28LARRABEE	JCPL	1	JC-P7-1-JCC-230-10A	tower	869.0	58.8	105.75	DC	407.96

Bus #	Bus	MW Impact
206306	28LKWD G1	5.7
206308	28LKWD G2	5.7
206312	28LKWD G3	4.24
206325	28O C GEN	228.34
206360	28O CRK C1	2.17
206361	28O CRK C2	1.47
206366	28LKWD CT1	10.81
206367	28LKWD CT2	10.81
207207	28JCB_W1-129	0.11
207208	28JCB_W4-025	0.14
227801	ONTC&DCT	5.03
227843	MARINGEN E	0.52
227928	V4-067E	0.22
292063	V1-021 E	0.03
292099	V1-030 E3	0.1
292967	U2-045 E	2.27
293404	V3-036	0.72
901981	W1-119 C	0.39
901982	W1-119 E	3.71
901991	W1-120C	2.53
901992	W1-120E	4.12
902082	W1-129E	1.0
902321	W2-019 C	0.13
902322	W2-019 E	1.18
902432	W2-030 E	0.8
902692	W2-056 E	0.89
902842	W2-071E	0.18
902951	W2-082 C OP1	0.36
902952	W2-082 E OP1	3.39
903152	W2-102 E	0.55
904042	V4-005 E	0.23
904432	W3-124 E	0.24
905232	W4-029 E	0.23
905252	W4-025 E	1.42
905532	W4-063 E	0.57
905792	W4-103 E	0.6
907272	X1-085 E	0.34
912101	X4-015 C	0.11
912102	X4-015 E	1.0
913332	Y1-075 E	0.21

Bus #	Bus	MW Impact
915022	Y3-012 E	0.98
917611	Z2-102 C	0.29
917612	Z2-102 E	2.71
917682	Z2-109 E	2.07
918452	AA1-060 E	4.89
919672	AA2-049 E	0.43
924701	AB2-122 C	0.09
924702	AB2-122 E	0.16
930002	AB1-001 E	0.19
930102	AB1-025 E	0.54
930891	AB1-138 C	0.98
930892	AB1-138 E	1.63
931122	AB1-163 E	0.82
931191	AB1-169A	49.18
932361	AC2-050 C O1	0.42
932362	AC2-050 E O1	0.68
933962	AD1-019 E	0.99
934351	AD1-059	1.02
936541	AD2-069 C	0.21
936542	AD2-069 E	0.1
938151	AE1-020 C O1	114.64
938152	AE1-020 E O1	293.32
938301	AE1-045 C	0.18
938302	AE1-045 E	0.09
938311	AE1-046 C	0.18
938312	AE1-046 E	0.09
BAYOU	BAYOU	0.18
BIG_CAJUN1	BIG_CAJUN1	0.28
BIG_CAJUN2	BIG_CAJUN2	0.57
BLUEG	BLUEG	0.98
CALDERWOOD	CALDERWOOD	0.09
CANNELTON	CANNELTON	0.06
CARR	CARR	0.97
CATAWBA	CATAWBA	0.05
CHEOAH	CHEOAH	0.08
CHILHOWEE	CHILHOWEE	0.03
CHOCTAW	CHOCTAW	0.19
COFFEEN	COFFEEN	0.1
COTTONWOOD	COTTONWOOD	0.74
DEARBORN	DEARBORN	0.2
DUCKCREEK	DUCKCREEK	0.23
EDWARDS	EDWARDS	0.1
ELMERSMITH	ELMERSMITH	0.1
FARMERCITY	FARMERCITY	0.07
G-007	G-007	9.99
GIBSON	GIBSON	0.04
HAMLET	HAMLET	0.15
NEWTON	NEWTON	0.27
O-066	O-066	13.68
PRAIRIE	PRAIRIE	0.49
RENSSELAER	RENSSELAER	0.77
SANTEETLA	SANTEETLA	0.02

Bus #	Bus	MW Impact
SMITHLAND	SMITHLAND	0.04
TATANKA	TATANKA	0.12
TILTON	TILTON	0.12
TRIMBLE	TRIMBLE	0.11
TVA	TVA	0.3
UNIONPOWER	UNIONPOWER	0.13

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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
35197	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	2	JC-P2-3-JCC-230-13H	breaker	817.0	58.63	126.54	DC	554.85

Bus #	Bus	MW Impact
206306	28LKWD G1	10.08
206308	28LKWD G2	10.08
206312	28LKWD G3	7.49
206325	28O C GEN	310.57
206360	28O CRK C1	2.95
206361	28O CRK C2	2.0
206366	28LKWD CT1	19.11
206367	28LKWD CT2	19.11
227801	ONTC&DCT	5.46
227843	MARINGEN E	0.57
227928	V4-067E	0.24
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	1.8
938151	AE1-020 C O1	155.91
938152	AE1-020 E O1	398.94
BAYOU	BAYOU	0.27
BIG_CAJUN1	BIG_CAJUN1	0.42
BIG_CAJUN2	BIG_CAJUN2	0.85
BLUEG	BLUEG	1.36
CALDERWOOD	CALDERWOOD	0.14
CANNELTON	CANNELTON	0.08
CARR	CARR	0.55
CATAWBA	CATAWBA	0.09
CHEOAH	CHEOAH	0.13
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.28
COFFEEN	COFFEEN	0.14

Bus #	Bus	MW Impact
COTTONWOOD	COTTONWOOD	1.09
DEARBORN	DEARBORN	0.25
DUCKCREEK	DUCKCREEK	0.31
EDWARDS	EDWARDS	0.14
ELMERSMITH	ELMERSMITH	0.14
FARMERCITY	FARMERCITY	0.09
G-007	G-007	5.94
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.27
NEWTON	NEWTON	0.37
O-066	O-066	7.65
PRAIRIE	PRAIRIE	0.69
RENSSELAER	RENSSELAER	0.43
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.05
TATANKA	TATANKA	0.17
TILTON	TILTON	0.17
TRIMBLE	TRIMBLE	0.15
TVA	TVA	0.46
UNIONPOWER	UNIONPOWER	0.2

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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
35236	206323	28LAKEWOOD	JCPL	206294	28LARRABEE	JCPL	1	JC-P2-3-JCC-230-13A	breaker	869.0	51.79	116.58	DC	563.05

Bus #	Bus	MW Impact
206306	28LKWD G1	10.2
206308	28LKWD G2	10.2
206312	28LKWD G3	7.58
206325	28O C GEN	315.15
206360	28O CRK C1	3.0
206361	28O CRK C2	2.03
206366	28LKWD CT1	19.34
206367	28LKWD CT2	19.34
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	0.88
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	1.82
938151	AE1-020 C O1	158.22
938152	AE1-020 E O1	404.83
BAYOU	BAYOU	0.29
BIG_CAJUN1	BIG_CAJUN1	0.45
BIG_CAJUN2	BIG_CAJUN2	0.9
BLUEG	BLUEG	1.44
CALDERWOOD	CALDERWOOD	0.15
CANNELTON	CANNELTON	0.09
CARR	CARR	0.57
CATAWBA	CATAWBA	0.09
CHEOAH	CHEOAH	0.14
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.3
COFFEEN	COFFEEN	0.15

Bus #	Bus	MW Impact
COTTONWOOD	COTTONWOOD	1.16
DEARBORN	DEARBORN	0.27
DUCKCREEK	DUCKCREEK	0.33
EDWARDS	EDWARDS	0.15
ELMERSMITH	ELMERSMITH	0.15
FARMERCITY	FARMERCITY	0.1
G-007	G-007	5.47
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.29
NEWTON	NEWTON	0.4
O-066	O-066	7.76
PRAIRIE	PRAIRIE	0.74
RENSSELAER	RENSSELAER	0.45
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.18
TILTON	TILTON	0.18
TRIMBLE	TRIMBLE	0.16
TVA	TVA	0.48
UNIONPOWER	UNIONPOWER	0.21

Affected Systems

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).

Contingencies

Contingency Name	Contingency Definition
JC-P2-3-JCC-230-85	CONTINGENCY 'JC-P2-3-JCC-230-85' /* SOUTH RIVER JUNCTION PARLIN-G1047 RARITAN RIVER LINES STUCK BREAKER DISCONNECT BRANCH FROM BUS 206410 TO BUS 206322 CKT 1 /* SOUTH RIVER JUNCTION - PARLIN 230 LINE DISCONNECT BUS 206314 /* RED OAK 230 KV A TAP DISCONNECT BUS 206363 /* RED OAK 230 KV #2 DISCONNECT BUS 206364 /* RED OAK 230 KV #3 END
JC-P2-3-JCC-230-81	CONTINGENCY 'JC-P2-3-JCC-230-81' /* SOUTH RIVER JUNCTION T-R11 RING A LINES STUCK BREAKER DISCONNECT BUS 206315 /* RED OAK 230 KV B TAP DISCONNECT BUS 206362 /* RED OAK 230 KV #1 DISCONNECT BUS 206365 /* RED OAK 230 KV #4 DISCONNECT BRANCH FROM BUS 206410 TO BUS 206411 CKT 1 /* SOUTH RIVER JUNCTION - R11 RING A 230 LINE END
PS_P1-2_#1LINE	CONTINGENCY 'PS_P1-2_#1LINE' /* LAKE NELSON TO RARITAN RIVER DISCONNECT BUS 218331 /* KILMER #1 END
PS_P2-3_LNEPS_P1-2_1_LT	CONTINGENCY 'PS_P2-3_LNEPS_P1-2_1_LT' /* STUCK BREAKER ON LAKE NELSON I LINE DISCONNECT BUS 218312 /* GREEN BROOK STATION DISCONNECT BUS 218301 /* MIDDLE LOSS OF BUS DISCONNECT BUS 218333 /* LAKE NELSON BUS I DISCONNECT BUS 218331 /* REMOVE KILMER LINE #1 CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER MOVE 8 MW LOAD FROM BUS 218387 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218385 TO BUS 218393 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO MDWRD T2 MOVE 8 MW LOAD FROM BUS 218386 TO BUS 218347 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO BNNTLANE T2 CLOSE LINE FROM BUS 218388 TO BUS 218389 CKT Z /* LAKE NELSON MOVE 8 MW LOAD FROM BUS 218389 TO BUS 218384 /* INTERSTATION TIE TRANSFER LOAD FROM LNELSN TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218388 TO BUS 218385 /* INTERSTATION TIE TRANSFER LOAD FROM LNELSN TO KILMER T4 CLOSE LINE FROM BUS 218382 TO BUS 218383 CKT Z /* GREENBROOK MOVE 8 MW LOAD FROM BUS 218382 TO BUS 218406 /* INTERSTATION TIE TRANSFER LOAD FROM GREENBK TO SOMRVLL T2 MOVE 8 MW LOAD FROM BUS 218382 TO BUS 218386 /* INTERSTATION TIE TRANSFER LOAD FROM GREENBK TO KILMER T1 MOVE 8 MW LOAD FROM BUS 218383 TO BUS 218395 /* INTERSTATION TIE TRANSFER LOAD FROM GREENBK TO SOUTH SECOND ST.(METUCHEN 26KV IM) END

Contingency Name	Contingency Definition
PS_P1-2_#2LINE_LT	CONTINGENCY 'PS_P1-2_#2LINE_LT' /* LAKE NELSON TO RARITIAN RIVER DISCONNECT BUS 218332 /* REMOVE KILMER CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER MOVE 8 MW LOAD FROM BUS 218384 TO BUS 218383 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO GREENBK T1 MOVE 8 MW LOAD FROM BUS 218387 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218385 TO BUS 218393 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO MDWRD T2 MOVE 8 MW LOAD FROM BUS 218386 TO BUS 218347 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO BNNTLANE T2 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

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-230-26D	CONTINGENCY 'JC-P2-3-JCC-230-26D' /* RARITAN RIVER B146 STUCK BREAKER DISCONNECT BUS 206314 /* RED OAK 230 KV A TAP DISCONNECT BUS 206363 /* RED OAK 230 KV #2 DISCONNECT BUS 206364 /* RED OAK 230 KV #3 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 13 /* RARITAN RIVER #13 230/115 KV TRANSFORMER DISCONNECT BUS 206403 /* WOODBRIDGE GENERATOR END
JC-P2-3-JCC-230-26B	CONTINGENCY 'JC-P2-3-JCC-230-26B' /* RARITAN RIVER B144 STUCK BREAKER DISCONNECT BUS 206315 /* RED OAK 230 KV B TAP DISCONNECT BUS 206362 /* RED OAK 230 KV #1 DISCONNECT BUS 206365 /* RED OAK 230 KV #4 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 13 /* RARITAN RIVER #13 230/115 KV TRANSFORMER DISCONNECT BUS 206403 /* WOODBRIDGE GENERATOR END
JC-P2-3-JCC-230-20_A	CONTINGENCY 'JC-P2-3-JCC-230-20_A' /* RAR RIVER-RED OAK-SO.RIVER & SO.RIVER 1_3 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206363 CKT 1 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206364 CKT 1 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206411 CKT 1 /* BUS 206321 IS REPLACED WITH 206411 DUE TO R11 B. FEB. 17_ 2009. DISCONNECT BUS 206314 DISCONNECT BUS 206363 DISCONNECT BUS 206364 END
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-P7-1-JCC-230-13	CONTINGENCY 'JC-P7-1-JCC-230-13' /* MANITOU-OYSTER CREEK 230 LINES & OYSTER GEN DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 2 DISCONNECT BRANCH FROM BUS 206302 TO BUS 206325 CKT 1 END

Contingency Name	Contingency Definition
PS_P2-3_LNEPS_P1-2_2_LT	CONTINGENCY 'PS_P2-3_LNEPS_P1-2_2_LT' /* LAKE NELSON LINE #2 STUCK BREAKER DISCONNECT BUS 218334 /* LAKE NELSON LOSS OF BUS W SIDE DISCONNECT BUS 218522 /* REMOVE MIDDLESEX DISCONNECT BUS 218332 /* REMOVE KILMER CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER MOVE 8 MW LOAD FROM BUS 218384 TO BUS 218383 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO GREENBK T1 MOVE 8 MW LOAD FROM BUS 218387 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218385 TO BUS 218393 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO MDWRD T2 MOVE 8 MW LOAD FROM BUS 218386 TO BUS 218347 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO BNNTLANE T2 CLOSE LINE FROM BUS 218388 TO BUS 218389 CKT Z /* LAKE NELSON MOVE 8 MW LOAD FROM BUS 218389 TO BUS 218384 /* INTERSTATION TIE TRANSFER LOAD FROM LNELSN TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218388 TO BUS 218385 /* INTERSTATION TIE TRANSFER LOAD FROM LNELSN TO KILMER T4 END
PS_P1-2_#2LINE	CONTINGENCY 'PS_P1-2_#2LINE' /* LAKE NELSON TO RARITIAN RIVER DISCONNECT BUS 218332 /* KILMER LINE #2 END
JC-P2-3-JCC-230-18A	CONTINGENCY 'JC-P2-3-JCC-230-18A' /* OYSTER CRK-MANITOU & MANITOU-WHITINGS 230 KV DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206319 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206277 CKT 7 DISCONNECT BRANCH FROM BUS 206319 TO BUS 206281 CKT 4 END
AE_P1-2 OY CK-CEDAR	CONTINGENCY 'AE_P1-2 OY CK-CEDAR' OPEN LINE FROM BUS 206302 TO BUS 227955 CIRCUIT 1 / END
Base Case	
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
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

Contingency Name	Contingency Definition
JC-P2-3-JCC-230-026A	CONTINGENCY 'JC-P2-3-JCC-230-026A' /* RARITAN RIVER B143 STUCK BREAKER DISCONNECT BUS 206315 /* RED OAK 230 KV B TAP DISCONNECT BUS 206362 /* RED OAK 230 KV #1 DISCONNECT BUS 206365 /* RED OAK 230 KV #4 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 17 /* RARITAN RIVER #17 230/115 KV TRANSFORMER DISCONNECT BUS 206350 /* SAYREVILLE GENERATOR DISCONNECT BUS 206351 /* SAYREVILLE GENERATOR END
JC-P2-3-JCC-230-026C	CONTINGENCY 'JC-P2-3-JCC-230-026C' /* RARITAN RIVER B145 STUCK BREAKER DISCONNECT BUS 206314 /* RED OAK 230 KV A TAP DISCONNECT BUS 206363 /* RED OAK 230 KV #2 DISCONNECT BUS 206364 /* RED OAK 230 KV #3 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 17 /* RARITAN RIVER #17 230/115 KV TRANSFORMER DISCONNECT BUS 206350 /* SAYREVILLE GENERATOR DISCONNECT BUS 206351 /* SAYREVILLE GENERATOR 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

Short Circuit- Option 1

Short Circuit

The following Breakers are overduty:

None

Network Impacts – Option 2

The Queue Project AE1-020 was evaluated as a 1100 MW (Capacity 309.1 MW) injection at the Larrabee 230 kV substation in the JCPL area. Project AE1-020 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-020 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Load Flow – Option 2

Generation Deliverability

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

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
35994	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P1-2_#2LINE_LT	single	813.0	92.6	99.73	DC	57.3
35995	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P1-2_#2LINE	single	813.0	91.77	98.89	DC	57.3

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
36268	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	28.94	34.92	DC	74.81
35381	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P2-3_LNEPS_P1-2_2_LT	breaker	813.0	91.49	103.1	DC	203.93
35470	206305	28RAR RVR	JCPL	218332	KILMER_W	PSE&G	1	PS_P2-3_LNEPS_P1-2_1_LT	breaker	817.0	86.39	95.05	DC	152.93
35358	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26B	breaker	869.0	97.71	108.6	DC	206.94
35359	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-81	breaker	869.0	91.67	100.19	DC	161.16
35360	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-026A	breaker	869.0	84.48	95.4	DC	207.75
35361	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-19_E	breaker	869.0	79.63	90.49	DC	206.47
35339	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-85	breaker	869.0	96.62	104.97	DC	157.74
35340	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-026C	breaker	869.0	88.78	99.66	DC	206.69
35341	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-20_A	breaker	869.0	83.74	94.55	DC	205.4

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
35338	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26D	breaker	869.0	101.96	112.8	DC	205.9

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	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
35990	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P1-2_#2LINE_LT	operation	813.0	90.9	102.51	DC	203.93
36049	218331	KILMER_I	PSE&G	218333	LNELSN_I	PSE&G	1	PS_P1-2_#2LINE	operation	805.0	84.79	96.51	DC	203.93
36014	218332	KILMER_W	PSE&G	218334	LNELSN_W	PSE&G	1	PS_P1-2_#1LINE	operation	679.0	90.2	100.65	DC	153.36

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.

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
35381	206305	28RAR RVR	JCPL	218331	KILMER_I	PSE&G	1	PS_P2-3_LNEPS_P1-2_2_LT	breaker	813.0	91.49	103.1	DC	203.93

Bus #	Bus	MW Impact
206325	28O C GEN	94.74
206329	28S RIV G3	8.16
206350	28RRCT1&2	7.4
206351	28RRCT3&4	6.93
206362	28RDOAKCT1	14.91
206363	28RDOAKCT2	14.88
206364	28RDOAKCT3	14.88
206365	28RDOAKST1	20.9
206403	28W4-009	64.6
206412	28R11	212.96
901032	W1-024E OP1	0.46
901112	W1-032 E OP1	0.28
901422	W1-113 E	0.85
901912	W1-112E OP1	0.83
901982	W1-119 E	1.46
901991	W1-120C	1.0
901992	W1-120E	1.63
902032	W1-124E	3.45
902082	W1-129E	0.39
902322	W2-019 E	0.47
902912	W2-078 E	1.05
902952	W2-082 E OP1	1.34
903982	W3-079 E	0.86
905252	W4-025 E	0.56
905502	W4-060 E OP1	2.39
907082	X1-037 E	2.45
907272	X1-085 E	0.41
912102	X4-015 E	0.39
912182	X4-031 E	0.5
914092	Y2-051 E	0.6
917612	Z2-102 E	1.07
917682	Z2-109 E	9.68
918452	AA1-060 E	2.56
919662	AA2-048 E	1.37
919672	AA2-049 E	0.84
920732	AA2-184 E	5.61
924852	AB2-139 E	0.08
927132	AC1-207 E	1.67
930891	AB1-138 C	0.61
930892	AB1-138 E	1.02

Bus #	Bus	MW Impact
931122	AB1-163 E	0.84
934032	AD1-028 E	0.07
934841	AD1-113	18.12
937261	AD2-165	19.36
938151	AE1-020 C O2	57.3
938152	AE1-020 E O2	146.62
938211	AE1-034 C O2	51.55
938212	AE1-034 E O2	131.9
BAYOU	BAYOU	0.7
BIG_CAJUN1	BIG_CAJUN1	1.08
BIG_CAJUN2	BIG_CAJUN2	2.18
BLUEG	BLUEG	3.44
CALDERWOOD	CALDERWOOD	0.36
CANNELTON	CANNELTON	0.21
CARR	CARR	1.13
CATAWBA	CATAWBA	0.23
CHEOAH	CHEOAH	0.33
CHILHOWEE	CHILHOWEE	0.12
CHOCTAW	CHOCTAW	0.72
COFFEEN	COFFEEN	0.36
COTTONWOOD	COTTONWOOD	2.79
DEARBORN	DEARBORN	0.62
DUCKCREEK	DUCKCREEK	0.79
EDWARDS	EDWARDS	0.36
ELMERSMITH	ELMERSMITH	0.36
FARMERCITY	FARMERCITY	0.24
G-007A	G-007A	124.08
GIBSON	GIBSON	0.14
HAMLET	HAMLET	0.73
NEWTON	NEWTON	0.95
O-066	O-066	17.66
PRAIRIE	PRAIRIE	1.76
RENSSELAER	RENSSELAER	0.9
SANTEETLA	SANTEETLA	0.1
SMITHLAND	SMITHLAND	0.14
TATANKA	TATANKA	0.43
TILTON	TILTON	0.43
TRIMBLE	TRIMBLE	0.38
TVA	TVA	1.17
UNIONPOWER	UNIONPOWER	0.52

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
36268	206302	28OYSTER C	JCPL	227955	CEDAR	AE	1	JC-P7-1-JCC-230-10A	tower	564.0	28.94	34.92	DC	74.81

Bus #	Bus	MW Impact
206306	28LKWD G1	4.93
206308	28LKWD G2	4.93
206312	28LKWD G3	3.66
206325	28O C GEN	248.45
206360	28O CRK C1	2.36
206361	28O CRK C2	1.6
206366	28LKWD CT1	9.34
206367	28LKWD CT2	9.34
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	0.88
938151	AE1-020 C O2	21.02
938152	AE1-020 E O2	53.79
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
BAYOU	BAYOU	0.08
BIG_CAJUN1	BIG_CAJUN1	0.12
BIG_CAJUN2	BIG_CAJUN2	0.24
BLUEG	BLUEG	0.33
CALDERWOOD	CALDERWOOD	0.04
CANNELTON	CANNELTON	0.02
CATAWBA	CATAWBA	0.03

Bus #	Bus	MW Impact
CBM-N	CBM-N	0.69
CHEOAH	CHEOAH	0.04
CHILHOWEE	CHILHOWEE	0.01
CHOCTAW	CHOCTAW	0.08
COFFEEN	COFFEEN	0.03
COTTONWOOD	COTTONWOOD	0.3
DEARBORN	DEARBORN	0.05
DUCKCREEK	DUCKCREEK	0.07
EDWARDS	EDWARDS	0.03
ELMERSMITH	ELMERSMITH	0.04
FARMERCITY	FARMERCITY	0.02
G-007A	G-007A	8.08
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.11
NEWTON	NEWTON	0.09
NYISO	NYISO	3.01
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

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
35470	206305	28RAR RVR	JCPL	218332	KILMER_W	PSE&G	1	PS_P2-3_LNEPS_P1-2_1_LT	breaker	817.0	86.39	95.05	DC	152.93

Bus #	Bus	MW Impact
206325	28O C GEN	71.45
206329	28S RIV G3	5.98
206350	28RRCT1&2	5.41
206351	28RRCT3&4	5.07
206362	28RDOAKCT1	10.92
206363	28RDOAKCT2	10.89
206364	28RDOAKCT3	10.89
206365	28RDOAKST1	15.3
206403	28W4-009	47.26
206412	28R11	155.95
901032	W1-024E OP1	0.35
901112	W1-032 E OP1	0.21
901422	W1-113 E	0.64
901912	W1-112E OP1	0.62
901982	W1-119 E	1.11
901991	W1-120C	0.76
901992	W1-120E	1.23
902032	W1-124E	2.56
902082	W1-129E	0.3
902322	W2-019 E	0.35
902912	W2-078 E	0.79
902952	W2-082 E OP1	1.02
903982	W3-079 E	0.65
905252	W4-025 E	0.43
905502	W4-060 E OP1	1.76
907082	X1-037 E	1.82
907272	X1-085 E	0.31
912102	X4-015 E	0.3
912182	X4-031 E	0.37
914092	Y2-051 E	0.45
917612	Z2-102 E	0.81
917682	Z2-109 E	7.09
918452	AA1-060 E	1.95
919662	AA2-048 E	1.03
919672	AA2-049 E	0.62
920732	AA2-184 E	4.15
924852	AB2-139 E	0.06
927132	AC1-207 E	1.25
930891	AB1-138 C	0.46
930892	AB1-138 E	0.77

Bus #	Bus	MW Impact
931122	AB1-163 E	0.63
934032	AD1-028 E	0.05
934841	AD1-113	13.25
937261	AD2-165	14.18
937512	AD2-210 E	0.18
938151	AE1-020 C O2	42.97
938152	AE1-020 E O2	109.96
938211	AE1-034 C O2	38.78
938212	AE1-034 E O2	99.22
BAYOU	BAYOU	0.42
BIG_CAJUN1	BIG_CAJUN1	0.65
BIG_CAJUN2	BIG_CAJUN2	1.3
BLUEG	BLUEG	2.09
CALDERWOOD	CALDERWOOD	0.22
CANNELTON	CANNELTON	0.13
CARR	CARR	1.23
CATAWBA	CATAWBA	0.13
CHEOAH	CHEOAH	0.2
CHILHOWEE	CHILHOWEE	0.07
CHOCTAW	CHOCTAW	0.43
COFFEEN	COFFEEN	0.22
COTTONWOOD	COTTONWOOD	1.67
DEARBORN	DEARBORN	0.39
DUCKCREEK	DUCKCREEK	0.48
EDWARDS	EDWARDS	0.22
ELMERSMITH	ELMERSMITH	0.22
FARMERCITY	FARMERCITY	0.14
G-007A	G-007A	90.78
GIBSON	GIBSON	0.09
HAMLET	HAMLET	0.42
NEWTON	NEWTON	0.57
O-066	O-066	22.64
PRAIRIE	PRAIRIE	1.06
RENSSELAER	RENSSELAER	0.97
SANTEETLA	SANTEETLA	0.06
SMITHLAND	SMITHLAND	0.08
TATANKA	TATANKA	0.26
TILTON	TILTON	0.26
TRIMBLE	TRIMBLE	0.23
TVA	TVA	0.7
UNIONPOWER	UNIONPOWER	0.31

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
35358	206314	28RED OAKA	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26B	breaker	869.0	97.71	108.6	DC	206.94

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.35
206325	28O C GEN	96.27
206327	28S RIV G1	7.85
206328	28S RIV G2	7.85
206329	28S RIV G3	10.35
206358	28PARLN1&2	4.71
206359	28PARLN3&4	5.65
206363	28RDOAKCT2	19.18
206364	28RDOAKCT3	19.18
206412	28R11	269.92
207144	28HOW_X1-037	0.23
207204	28HOL_W1-112	0.08
207206	28TIN_W1-124	0.39
901112	W1-032 E OP1	0.2
901912	W1-112E OP1	0.76
901982	W1-119 E	1.41
901991	W1-120C	0.96
901992	W1-120E	1.57
902032	W1-124E	3.66
902082	W1-129E	0.38
902322	W2-019 E	0.45
902952	W2-082 E OP1	1.28
903981	W3-079 C	0.09
903982	W3-079 E	0.88
905252	W4-025 E	0.54
907082	X1-037 E	2.16
912102	X4-015 E	0.38
912182	X4-031 E	0.51
914092	Y2-051 E	0.61
917612	Z2-102 E	1.03
917682	Z2-109 E	12.27
919662	AA2-048 E	1.39
919672	AA2-049 E	0.89
920732	AA2-184 E	5.92
925541	AC1-029	2.11
930891	AB1-138 C	0.62
930892	AB1-138 E	1.03
931122	AB1-163 E	0.84
934032	AD1-028 E	0.03
937261	AD2-165	24.54

Bus #	Bus	MW Impact
938151	AE1-020 C O2	58.15
938152	AE1-020 E O2	148.79
938211	AE1-034 C O2	52.33
938212	AE1-034 E O2	133.9
BAYOU	BAYOU	0.3
BIG_CAJUN1	BIG_CAJUN1	0.45
BIG_CAJUN2	BIG_CAJUN2	0.91
BLUEG	BLUEG	1.49
CALDERWOOD	CALDERWOOD	0.15
CANNELTON	CANNELTON	0.09
CARR	CARR	1.04
CATAWBA	CATAWBA	0.09
CHEOAH	CHEOAH	0.14
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.3
COFFEEN	COFFEEN	0.16
COTTONWOOD	COTTONWOOD	1.18
DEARBORN	DEARBORN	0.28
DUCKCREEK	DUCKCREEK	0.35
EDWARDS	EDWARDS	0.16
ELMERSMITH	ELMERSMITH	0.15
FARMERCITY	FARMERCITY	0.1
G-007	G-007	30.11
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.28
NEWTON	NEWTON	0.41
O-066	O-066	17.86
PRAIRIE	PRAIRIE	0.76
RENSSELAER	RENSSELAER	0.82
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.19
TILTON	TILTON	0.19
TRIMBLE	TRIMBLE	0.17
TVA	TVA	0.49
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
35338	206315	28RED OAKB	JCPL	206305	28RAR RVR	JCPL	1	JC-P2-3-JCC-230-26D	breaker	869.0	101.96	112.8	DC	205.9

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.35
206325	28O C GEN	95.76
206327	28S RIV G1	7.69
206328	28S RIV G2	7.69
206329	28S RIV G3	10.13
206358	28PARLN1&2	4.78
206359	28PARLN3&4	5.73
206362	28RDOAKCT1	19.22
206365	28RDOAKST1	26.94
206412	28R11	264.32
207144	28HOW_X1-037	0.23
207204	28HOL_W1-112	0.08
207206	28TIN_W1-124	0.38
901112	W1-032 E OP1	0.2
901912	W1-112E OP1	0.76
901982	W1-119 E	1.41
901991	W1-120C	0.96
901992	W1-120E	1.56
902032	W1-124E	3.65
902082	W1-129E	0.38
902322	W2-019 E	0.44
902952	W2-082 E OP1	1.28
903981	W3-079 C	0.09
903982	W3-079 E	0.87
905252	W4-025 E	0.53
907082	X1-037 E	2.15
912102	X4-015 E	0.38
912182	X4-031 E	0.51
914092	Y2-051 E	0.61
917612	Z2-102 E	1.03
917682	Z2-109 E	12.01
918452	AA1-060 E	2.12
919662	AA2-048 E	1.39
919672	AA2-049 E	0.88
920732	AA2-184 E	5.9
925541	AC1-029	2.07
930891	AB1-138 C	0.62
930892	AB1-138 E	1.03
931122	AB1-163 E	0.83
934032	AD1-028 E	0.03

Bus #	Bus	MW Impact
937261	AD2-165	24.03
938151	AE1-020 C O2	57.86
938152	AE1-020 E O2	148.04
938211	AE1-034 C O2	52.06
938212	AE1-034 E O2	133.2
BAYOU	BAYOU	0.32
BIG_CAJUN1	BIG_CAJUN1	0.49
BIG_CAJUN2	BIG_CAJUN2	0.99
BLUEG	BLUEG	1.61
CALDERWOOD	CALDERWOOD	0.16
CANNELTON	CANNELTON	0.1
CARR	CARR	1.04
CATAWBA	CATAWBA	0.1
CHEOAH	CHEOAH	0.15
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.33
COFFEEN	COFFEEN	0.17
COTTONWOOD	COTTONWOOD	1.27
DEARBORN	DEARBORN	0.3
DUCKCREEK	DUCKCREEK	0.37
EDWARDS	EDWARDS	0.17
ELMERSMITH	ELMERSMITH	0.17
FARMERCITY	FARMERCITY	0.11
G-007	G-007	30.03
GIBSON	GIBSON	0.07
HAMLET	HAMLET	0.31
NEWTON	NEWTON	0.44
O-066	O-066	17.88
PRAIRIE	PRAIRIE	0.82
RENSSELAER	RENSSELAER	0.82
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.2
TILTON	TILTON	0.2
TRIMBLE	TRIMBLE	0.18
TVA	TVA	0.53
UNIONPOWER	UNIONPOWER	0.24

Affected Systems

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).

Contingencies

Contingency Name	Contingency Definition
JC-P2-3-JCC-230-85	CONTINGENCY 'JC-P2-3-JCC-230-85' /* SOUTH RIVER JUNCTION PARLIN-G1047 RARITAN RIVER LINES STUCK BREAKER DISCONNECT BRANCH FROM BUS 206410 TO BUS 206322 CKT 1 /* SOUTH RIVER JUNCTION - PARLIN 230 LINE DISCONNECT BUS 206314 /* RED OAK 230 KV A TAP DISCONNECT BUS 206363 /* RED OAK 230 KV #2 DISCONNECT BUS 206364 /* RED OAK 230 KV #3 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-230-19_E	CONTINGENCY 'JC-P2-3-JCC-230-19_E' /* RAR RIVER-PARLIN-RED OAK & PARLIN 1_2 DISCONNECT BRANCH FROM BUS 206410 TO BUS 206315 CKT 1 DISCONNECT BUS 206315 DISCONNECT BUS 206362 DISCONNECT BUS 206365 END
JC-P2-3-JCC-230-81	CONTINGENCY 'JC-P2-3-JCC-230-81' /* SOUTH RIVER JUNCTION T-R11 RING A LINES STUCK BREAKER DISCONNECT BUS 206315 /* RED OAK 230 KV B TAP DISCONNECT BUS 206362 /* RED OAK 230 KV #1 DISCONNECT BUS 206365 /* RED OAK 230 KV #4 DISCONNECT BRANCH FROM BUS 206410 TO BUS 206411 CKT 1 /* SOUTH RIVER JUNCTION - R11 RING A 230 LINE END
PS_P2-3_LNEPS_P1-2_2_LT	CONTINGENCY 'PS_P2-3_LNEPS_P1-2_2_LT' /* LAKE NELSON LINE #2 STUCK BREAKER DISCONNECT BUS 218334 /* LAKE NELSON LOSS OF BUS W SIDE DISCONNECT BUS 218522 /* REMOVE MIDDLESEX DISCONNECT BUS 218332 /* REMOVE KILMER CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER MOVE 8 MW LOAD FROM BUS 218384 TO BUS 218383 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO GREENBK T1 MOVE 8 MW LOAD FROM BUS 218387 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218385 TO BUS 218393 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO MDWRD T2 MOVE 8 MW LOAD FROM BUS 218386 TO BUS 218347 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO BNNTLANE T2 CLOSE LINE FROM BUS 218388 TO BUS 218389 CKT Z /* LAKE NELSON MOVE 8 MW LOAD FROM BUS 218389 TO BUS 218384 /* INTERSTATION TIE TRANSFER LOAD FROM LNELSN TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218388 TO BUS 218385 /* INTERSTATION TIE TRANSFER LOAD FROM LNELSN TO KILMER T4 END

PS_P1-2_#2LINE	CONTINGENCY 'PS_P1-2_#2LINE' DISCONNECT BUS 218332 END /* LAKE NELSON TO RARITIAN RIVER /* KILMER LINE #2
PS_P1-2_#1LINE	CONTINGENCY 'PS_P1-2_#1LINE' DISCONNECT BUS 218331 END /* LAKE NELSON TO RARITIAN RIVER /* KILMER #1
PS_P2-3_LNEPS_P1-2_1_LT	CONTINGENCY 'PS_P2-3_LNEPS_P1-2_1_LT' DISCONNECT BUS 218312 DISCONNECT BUS 218301 DISCONNECT BUS 218333 DISCONNECT BUS 218331 CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z MOVE 8 MW LOAD FROM BUS 218387 TO BUS 218399 FROM KILMER TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218385 TO BUS 218393 FROM KILMER TO MDWRD T2 MOVE 8 MW LOAD FROM BUS 218386 TO BUS 218347 FROM KILMER TO BNNTLANE T2 CLOSE LINE FROM BUS 218388 TO BUS 218389 CKT Z MOVE 8 MW LOAD FROM BUS 218389 TO BUS 218384 FROM LNELSN TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218388 TO BUS 218385 FROM LNELSN TO KILMER T4 CLOSE LINE FROM BUS 218382 TO BUS 218383 CKT Z MOVE 8 MW LOAD FROM BUS 218382 TO BUS 218406 FROM GREENBK TO SOMRVLE T2 MOVE 8 MW LOAD FROM BUS 218382 TO BUS 218386 FROM GREENBK TO KILMER T1 MOVE 8 MW LOAD FROM BUS 218383 TO BUS 218395 FROM GREENBK TO SOUTH SECOND ST.(METUCHEN 26KV IM) END /* STUCK BREAKER ON LAKE NELSON I LINE /* GREEN BROOK STATION /* MIDDLE LOSS OF BUS /* LAKE NELSON BUS I /* REMOVE KILMER LINE #1 /* KILMER /* KILMER /* INTERSTATION TIE TRANSFER LOAD /* INTERSTATION TIE TRANSFER LOAD /* INTERSTATION TIE TRANSFER LOAD /* LAKE NELSON /* INTERSTATION TIE TRANSFER LOAD /* INTERSTATION TIE TRANSFER LOAD /* GREENBROOK /* INTERSTATION TIE TRANSFER LOAD /* INTERSTATION TIE TRANSFER LOAD /* INTERSTATION TIE TRANSFER LOAD
JC-P2-3-JCC-230-026A	CONTINGENCY 'JC-P2-3-JCC-230-026A' DISCONNECT BUS 206315 DISCONNECT BUS 206362 DISCONNECT BUS 206365 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 17 TRANSFORMER DISCONNECT BUS 206350 DISCONNECT BUS 206351 END /* RARITAN RIVER B143 STUCK BREAKER /* RED OAK 230 KV B TAP /* RED OAK 230 KV #1 /* RED OAK 230 KV #4 /* RARITAN RIVER #17 230/115 KV /* SAYREVILLE GENERATOR /* SAYREVILLE GENERATOR
JC-P2-3-JCC-230-026C	CONTINGENCY 'JC-P2-3-JCC-230-026C' DISCONNECT BUS 206314 DISCONNECT BUS 206363 DISCONNECT BUS 206364 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 17 TRANSFORMER DISCONNECT BUS 206350 DISCONNECT BUS 206351 END /* RARITAN RIVER B145 STUCK BREAKER /* RED OAK 230 KV A TAP /* RED OAK 230 KV #2 /* RED OAK 230 KV #3 /* RARITAN RIVER #17 230/115 KV /* SAYREVILLE GENERATOR /* SAYREVILLE GENERATOR
PS_P1-2_#2LINE_LT	CONTINGENCY 'PS_P1-2_#2LINE_LT' DISCONNECT BUS 218332 END /* LAKE NELSON TO RARITIAN RIVER /* REMOVE KILMER

	CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER MOVE 8 MW LOAD FROM BUS 218384 TO BUS 218383 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO GREENBK T1 MOVE 8 MW LOAD FROM BUS 218387 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218385 TO BUS 218393 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO MDWRD T2 MOVE 8 MW LOAD FROM BUS 218386 TO BUS 218347 /* INTERSTATION TIE TRANSFER LOAD FROM KILMER TO BNNTLANE T2 END
JC-P2-3-JCC-230-26D	CONTINGENCY 'JC-P2-3-JCC-230-26D' /* RARITAN RIVER B146 STUCK BREAKER DISCONNECT BUS 206314 /* RED OAK 230 KV A TAP DISCONNECT BUS 206363 /* RED OAK 230 KV #2 DISCONNECT BUS 206364 /* RED OAK 230 KV #3 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 13 /* RARITAN RIVER #13 230/115 KV TRANSFORMER DISCONNECT BUS 206403 /* WOODBRIDGE GENERATOR END
JC-P2-3-JCC-230-26B	CONTINGENCY 'JC-P2-3-JCC-230-26B' /* RARITAN RIVER B144 STUCK BREAKER DISCONNECT BUS 206315 /* RED OAK 230 KV B TAP DISCONNECT BUS 206362 /* RED OAK 230 KV #1 DISCONNECT BUS 206365 /* RED OAK 230 KV #4 DISCONNECT BRANCH FROM BUS 206305 TO BUS 206303 CKT 13 /* RARITAN RIVER #13 230/115 KV TRANSFORMER DISCONNECT BUS 206403 /* WOODBRIDGE GENERATOR END
JC-P2-3-JCC-230-20_A	CONTINGENCY 'JC-P2-3-JCC-230-20_A' /* RAR RIVER-RED OAK-SO.RIVER & SO.RIVER 1_3 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206363 CKT 1 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206364 CKT 1 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206411 CKT 1 /* BUS 206321 IS REPLACED WITH 206411 DUE TO R11 B. FEB. 17_ 2009. DISCONNECT BUS 206314 DISCONNECT BUS 206363 DISCONNECT BUS 206364 END

Short Circuit – Option 2

Short Circuit

The following Breakers are overduty:

None

Attachment 1 – AE1-020 One Line Diagram

Attachment 2 – AE1-020 Project Location