Generation Interconnection

Feasibility Study Report

for

Queue Project AF1-222

OCEANVIEW WIND 2 230 KV

165 MW Capacity / 600 MW Energy

January, 2020

Table of Contents

1 Introduction

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

2 Preface

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

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

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.

3 General

The Interconnection Customer (IC) has proposed an uprate to a planned offshore wind generating facility to be located in the Atlantic Ocean off the coast of New Jersey. This project is an increase to the Interconnection Customer's AE1-238 project, which will share the same property and point of interconnection. The AF1-222 queue position is a 600 MW uprate (165 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 1416 MW with 390 MW of this output being recognized by PJM as Capacity (see table below for clarity). The proposed in-service date for this uprate project is December 30, 2025. This study does not imply a TO commitment to this in-service date.

Queue	Maximum Facility Output (MFO) (MW)	Energy (MW)	Capacity (MW)
AE1-238	816	816	225
AF1-222	600	600	165
Total	**1416**	**1416**	**390**

Queue Number	**AF1-222**
Project Name	OCEANVIEW WIND 2 230 KV
State	New Jersey
County	(Atlantic Ocean)
Transmission Owner	JCPL
MFO	1416
MWE	600
MWC	165
Fuel	Wind
Basecase Study Year	2023

3.1 Point of Interconnection

The interconnection of the project with the JCPL system will be accomplished by utilizing the AE1-238 direct connection to the Oceanview 230 kV substation in the JCPL area. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct the associated attachment facilities. The project will also require non-direct connection upgrades at Oceanview substation.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AE1-238/AF1-222 generation project to connect to the FirstEnergy ("FE") transmission system. IC will be responsible for constructing all of the facilities on its side of the POI, including the Attachment facilities which connect the generator to the FE transmission system.

3.2 Cost Summary

The AF1-222 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$0
Direct Connection Network Upgrade	$0
Non Direct Connection Network Upgrades	$46,800
Total Costs	**$46,800**

In addition, the AF1-222 project may be responsible for a contribution to the following costs:

Description	Total Cost
System Upgrades	**$562,874,000**

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

The Feasibility Study is used to make a preliminary determination of the type and scope of Attachment Facilities, Local Upgrades, and Network Upgrades that will be necessary to accommodate the Interconnection Request and to provide the Interconnection Customer a preliminary estimate of the time that will be required to construct any necessary facilities and upgrades and the Interconnection Customer's cost responsibility. The System Impact Study provides refined and comprehensive estimates of cost responsibility and construction lead times for new facilities and system upgrades. Facilities Studies will include, commensurate with the degree of engineering specificity as provided in the Facilities Study Agreement, good faith estimates of the cost, determined in accordance with Section 217 of the Tariff,

(a) to be charged to each affected New Service Customer for the Facilities and System Upgrades that are necessary to accommodate this queue project;

(b) the time required to complete detailed design and construction of the facilities and upgrades; and

(c) a description of any site-specific environmental issues or requirements that could reasonably be anticipated to affect the cost or time required to complete construction of such facilities and upgrades.

The costs provided above exclude the Contribution in Aid of Construction ("CIAC") Federal Income Tax Gross Up charge. If, at a future date, it is determined that the CIAC Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

The required Attachment Facilities and Direct and Non-Direct Connection work for the interconnection of the AF1-222 generation project to the FE Transmission System is detailed in the following sections. The associated one-line with the generation project is shown in Attachment 1.

4 Transmission Owner Scope of Work

The interconnection of the project with the JCPL system will be accomplished by utilizing the AE1-238 direct connection to the Oceanview 230 kV substation in the JCPL area. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct the associated attachment facilities. The project will also require non-direct connection upgrades at Oceanview substation.

5 Attachment Facilities

There is no Attachment Facility scope of work required.

6 Direct Connection Cost Estimate

There is no Direct Connection scope of work required.

7 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
Update Relay Settings @ Oceanview	$46,800
Total Non-Direct Connection Facility Costs	$46,800

8 Schedule

Based on the scope of work for the Attachment Facilities and the Direct and/or Non-Direct Connection facilities, it is expected to take a minimum of **6 months** after the signing of an Interconnection Construction Service Agreement to complete the installation. If AF1-222 is completed at the same time as AE1-238, this work may be able to be combined with the interconnection work associated with AE1-238.

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.

9 Transmission Owner Analysis

9.1 Power Flow Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AE1-238/AF1-222 project did not contribute to any overloads on the FE transmission <100 kV system.

10 Interconnection Customer Requirements

10.1 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.

10.2 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 230 kV circuit breaker to protect the AE1-238/AF1-222 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 AE1-238/AF1-222 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.

10.3 Power Factor Requirements

The IC shall design its Wind or 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.

11 Revenue Metering and SCADA Requirements

11.1 PJM Requirements

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

11.2 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.

12 Network Impacts

The Queue Project AF1-222 was evaluated as a 600.0 MW (Capacity 165.0 MW) injection as an uprate to AE1-238 at the Oceanview 230 kV substation in the JCPL area. Project AF1-222 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-222 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Load Flow

13 Generation Deliverability

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42541377	206315	28RED OAKB	230.0	JCP&L	206305	28RARRVR	230.0	JCP&L	1	JC-P1-2-JCC-230-028	single	869.0	94.2	100.01	DC	50.51
42541456	218331	KILMER_I	230.0	PSE&G	218333	LNELSN_I	230.0	PSE&G	1	JC-P1-2-JCC-230-043T	single	805.0	97.77	102.9	DC	41.11
42541457	218331	KILMER_I	230.0	PSE&G	218333	LNELSN_I	230.0	PSE&G	1	PS_P1-2_#2LINE_LT	single	805.0	96.69	101.81	DC	41.11
42541483	218332	KILMER_W	230.0	PSE&G	218334	LNELSN_W	230.0	PSE&G	1	PS_P1-2_I-1023	single	679.0	98.75	103.15	DC	29.84
42541484	218332	KILMER_W	230.0	PSE&G	218334	LNELSN_W	230.0	PSE&G	1	JC-P1-2-JCC-230-042T	single	679.0	97.2	101.62	DC	29.91

14 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42768537	206286	28ATLANTIC	230.0	JCP&L	206310	28NEWPROSP	230.0	JCP&L	1	JC-P7-1-JCC-230-7A	tower	813.0	84.54	105.65	DC	171.42
42768576	206294	28LARRABEE	230.0	JCP&L	206318	28VANHISVL	230.0	JCP&L	1	JC-P7-1-JCC-230-11A	tower	869.0	93.73	104.27	DC	91.69
42237121	206300	28OCEANVW	230.0	JCP&L	206286	28ATLANTIC	230.0	JCP&L	Y	JC-P2-3-JCC-230-47B	breaker	869.0	66.93	133.37	DC	577.31
42237122	206300	28OCEANVW	230.0	JCP&L	206286	28ATLANTIC	230.0	JCP&L	Y	JC-P2-3-JCC-230-47C	breaker	869.0	82.99	129.18	DC	401.33
42237180	206300	28OCEANVW	230.0	JCP&L	206286	28ATLANTIC	230.0	JCP&L	X	JC-P2-3-JCC-230-47E	breaker	869.0	82.8	128.95	DC	401.05
42237181	206300	28OCEANVW	230.0	JCP&L	206286	28ATLANTIC	230.0	JCP&L	X	JC-P2-3-JCC-230-47D	breaker	869.0	81.44	127.52	DC	400.4
42768372	206300	28OCEANVW	230.0	JCP&L	206294	28LARRABEE	230.0	JCP&L	1	JC-P7-1-JCC-230-15	tower	869.0	62.69	124.37	DC	535.99
42768397	206309	28SMITHBRG	230.0	JCP&L	206326	28E WINDSR	230.0	JCP&L	1	PS_P7-1_I1023+GBK-LN_LT	tower	1394.0	97.03	114.2	DC	239.04
42768575	206310	28NEWPROSP	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	1	JC-P7-1-JCC-230-7A	tower	813.0	80.75	101.87	DC	171.42
42237457	206411	28R11RINGA	230.0	JCP&L	206410	28R11RINGB	230.0	JCP&L	1	JC-P2-3-JCC-230-85	breaker	999.0	91.89	106.2	DC	142.51
42237458	206411	28R11RINGA	230.0	JCP&L	206410	28R11RINGB	230.0	JCP&L	1	JC-P2-3-JCC-230-26D	breaker	999.0	94.59	104.27	DC	96.46

15 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42236940	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	2	JC-P2-3-JCC-230-15F	breaker	813.0	151.59	158.43	DC	122.8
42236941	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	2	JC-P2-3-JCC-230-13A	breaker	813.0	150.2	157.08	DC	123.58
42236945	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	1	JC-P2-3-JCC-230-15G	breaker	817.0	150.85	157.65	DC	122.8
42236946	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	1	JC-P2-3-JCC-230-15A	breaker	817.0	146.32	153.16	DC	123.58
41034227	206302	28OYSTERC	230.0	JCP&L	227955	CEDAR	230.0	AE	1	PS_P7-1_1LINE+2LINE	tower	564.0	136.13	140.87	DC	59.32
41632860	206302	28OYSTERC	230.0	JCP&L	227955	CEDAR	230.0	AE	1	JC-P2-3-JCC-230-18A	breaker	564.0	131.89	135.38	DC	43.64
46869064	206302	28OYSTERC	230.0	JCP&L	227955	CEDAR	230.0	AE	1	JC-P2-3-JCC-230-11	breaker	564.0	131.53	134.84	DC	41.36
49863000	206302	28OYSTERC	230.0	JCP&L	227955	CEDAR	230.0	AE	1	JC-P7-1-JCC-230-7A	tower	564.0	144.77	150.05	DC	66.07
42768396	206309	28SMITHBRG	230.0	JCP&L	206326	28E WINDSR	230.0	JCP&L	1	PS_P7-1_1LINE+2LINE	tower	1394.0	100.27	117.44	DC	239.1
42236930	206314	28REDOAKA	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	JC-P2-3-JCC-230-26B	breaker	869.0	168.67	189.97	DC	184.33
42236931	206314	28REDOAKA	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	JC-P2-3-JCC-230-026A	breaker	869.0	156.11	176.89	DC	179.83
42236925	206315	28REDOAKB	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	JC-P2-3-JCC-230-26D	breaker	869.0	172.37	193.58	DC	183.45
42236926	206315	28REDOAKB	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	JC-P2-3-JCC-230-026C	breaker	869.0	159.79	180.48	DC	178.97
41034358	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	PS_P7-1_I1023+GBK-LN_LT	tower	813.0	123.92	136.99	DC	106.09
42237333	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	JC-P2-3-JCC-230-80	breaker	869.0	106.49	117.7	DC	97.3
42768367	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PS_P7-1_1LINE+2LINE	tower	869.0	120.11	131.06	DC	95.06
42768368	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PS_P7-1_I1023+GBK-LN_LT	tower	869.0	117.85	128.79	DC	94.97
46869219	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PJM500_PS_P2-3_DEAN5_5-6	breaker	869.0	104.86	113.67	DC	76.53
46869220	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PJM_P4_P484B	breaker	869.0	104.85	113.66	DC	76.53
42237050	206410	28R11RINGB	230.0	JCP&L	206315	28REDOAKB	230.0	JCP&L	1	JC-P2-3-JCC-230-26D	breaker	869.0	127.75	149.07	DC	184.81
42237051	206410	28R11RINGB	230.0	JCP&L	206315	28REDOAKB	230.0	JCP&L	1	JC-P2-3-JCC-230-026C	breaker	869.0	115.48	136.28	DC	180.33
42237041	206411	28R11RINGA	230.0	JCP&L	206314	28REDOAKA	230.0	JCP&L	1	JC-P2-3-JCC-230-26B	breaker	869.0	131.56	152.96	DC	185.47
42237042	206411	28R11RINGA	230.0	JCP&L	206314	28REDOAKA	230.0	JCP&L	1	JC-P2-3-JCC-230-026A	breaker	869.0	119.32	140.2	DC	180.95

16 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42541346	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	2	JC-P1-2-JCC-230-017	operation	813.0	149.3	156.14	DC	122.81
42541347	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	2	Base Case	operation	678.0	117.09	122.46	DC	80.33
42541472	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	1	JC-P1-2-JCC-230-018	operation	817.0	136.78	142.66	DC	106.16
42541473	206294	28LARRABEE	230.0	JCP&L	206309	28SMITHBRG	230.0	JCP&L	1	Base Case	operation	650.0	122.13	127.73	DC	80.33
42541756	206300	28OCEANVW	230.0	JCP&L	206286	28ATLANTIC	230.0	JCP&L	Y	JC-P1-2-JCC-230-003	operation	869.0	76.53	122.27	DC	397.43
42541757	206300	28OCEANVW	230.0	JCP&L	206286	28ATLANTIC	230.0	JCP&L	X	JC-P1-2-JCC-230-004	operation	869.0	76.53	122.27	DC	397.43
41314210	206302	28OYSTER C	230.0	JCP&L	227955	CEDAR	230.0	AE	1	Base Case	operation	464.0	135.47	139.97	DC	46.32
41314211	206302	28OYSTER C	230.0	JCP&L	227955	CEDAR	230.0	AE	1	JC-P1-2-JCC-230-031	operation	564.0	128.09	132.52	DC	55.36
41314275	206305	28RAR RVR	230.0	JCP&L	218331	KILMER_I	230.0	PSE&G	1	PS_P1-2_#2LINE	operation	869.0	151.81	159.76	DC	149.5
41314280	206305	28RAR RVR	230.0	JCP&L	218331	KILMER_I	230.0	PSE&G	1	Base Case	operation	709.0	129.14	136.58	DC	114.11
41314450	206305	28RAR RVR	230.0	JCP&L	218332	KILMER_W	230.0	PSE&G	1	PS_P1-2_#1LINE	operation	817.0	133.3	139.47	DC	109.0
41314455	206305	28RAR RVR	230.0	JCP&L	218332	KILMER_W	230.0	PSE&G	1	Base Case	operation	650.0	106.99	111.48	DC	63.44
42541408	206314	28RED OAKA	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	JC-P1-2-JCC-230-027	operation	869.0	150.66	171.99	DC	184.56
42541409	206314	28RED OAKA	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	Base Case	operation	709.0	121.35	135.43	DC	99.22
42541372	206315	28RED OAKB	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	JC-P1-2-JCC-230-028	operation	869.0	154.45	175.68	DC	183.67
42541373	206315	28RED OAKB	230.0	JCP&L	206305	28RAR RVR	230.0	JCP&L	1	Base Case	operation	709.0	111.39	124.92	DC	95.33
41314677	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	JC-P1-2-JCC-230-042T	operation	813.0	103.09	113.7	DC	86.2
41314680	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	Base Case	operation	678.0	102.68	113.41	DC	72.68
42541854	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	Base Case	operation	706.0	109.92	119.45	DC	67.24
49598742	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PJM500_PS_P1-2_5022	operation	869.0	103.45	112.26	DC	76.47
42541727	206410	28R11RINGB	230.0	JCP&L	206315	28RED OAKB	230.0	JCP&L	1	JC-P1-2-JCC-230-028	operation	869.0	110.11	131.46	DC	185.02
42541679	206411	28R11RINGA	230.0	JCP&L	206314	28RED OAKA	230.0	JCP&L	1	JC-P1-2-JCC-230-027	operation	869.0	113.87	135.29	DC	185.69
41314953	218313	GREENBK_W	230.0	PSE&G	206239	28GILLET W	230.0	JCP&L	1	JC-P1-2-JCC-230-042T	operation	802.0	96.13	101.24	DC	88.94
42541450	218331	KILMER_I	230.0	PSE&G	218333	LNELSN_I	230.0	PSE&G	1	JC-P1-2-JCC-230-043T	operation	805.0	155.99	164.57	DC	149.5
42541455	218331	KILMER_I	230.0	PSE&G	218333	LNELSN_I	230.0	PSE&G	1	Base Case	operation	650.0	133.55	141.67	DC	114.11
42541477	218332	KILMER_W	230.0	PSE&G	218334	LNELSN_W	230.0	PSE&G	1	PS_P1-2_I-1023	operation	679.0	151.88	159.26	DC	108.51
42541482	218332	KILMER_W	230.0	PSE&G	218334	LNELSN_W	230.0	PSE&G	1	Base Case	operation	523.0	123.83	129.41	DC	63.44
42541609	218333	LNELSN_I	230.0	PSE&G	218301	MIDDLESEX_I	230.0	PSE&G	1	JC-P1-2-JCC-230-043T	operation	819.0	130.96	138.79	DC	138.86
42541614	218333	LNELSN_I	230.0	PSE&G	218301	MIDDLESEX_I	230.0	PSE&G	1	Base Case	operation	709.0	103.56	110.61	DC	108.09

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42541840	218334	LNELSN_W	230.0	PSE&G	218522	MIDDLESEX_W	230.0	PSE&G	1	JC-P1-2-JCC-230-042T	operation	887.0	112.49	118.15	DC	108.74
42541834	218522	MIDDLESEX_W	230.0	PSE&G	218313	GREENBK_W	230.0	PSE&G	1	JC-P1-2-JCC-230-042T	operation	887.0	112.49	118.15	DC	108.74

17 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
41034227,41632860,46869064,49863000	14	28OYSTER C 230.0 kV - CEDAR 230.0 kV Ckt 1	**AE** **at2318r0001 (135) : Oyster Creek-Cedar 230 kV Line: To mitigate the (ACE) Cedar Oyster Creek 230 kV line (from bus 227955 to bus 206302 ckt 1) overload, it will require increasing the emergency rating of the Cedar to Oyster Creek 230 kV line by rebuilding the circuit. The rebuild will include the installation of new poles, foundations, insulators, and conductor. In addition, various terminal reinforcements are required at Cedar.** **Project Type : FAC** **Cost : $63,000,000** **Time Estimate : 60.0 Months** **JCPL** **JCP&L-AF1-F-0012a (2163) : Oyster Creek-Cedar 230 kV Line: Reconductor line (~0.08 miles) Upgrade terminal equipment at Oyster Creek. Additionally, AE would need to replace their section of the limiting conductor and provide estimates for their replacement.** **Project Type : FAC** **Cost : $281,400** **Time Estimate : 9.0 Months**	$63,281,400
42237457,42237458	11	28R11RINGA 230.0 kV - 28R11RINGB 230.0 kV Ckt 1	**JCPL** **JCP&L-AF1-F-0026 (2182) : R11 Ring Bus A- R11 Ring Bus B 230 kV Line: Reconductor/ Replace existing conductors and terminal equipment.** **Project Type : FAC** **Cost : $670,000** **Time Estimate : 18.0 Months**	$670,000

ID	Index	Facility	Upgrade Description	Cost
42236945,42236946	13	28LARRABEE 230.0 kV - 28SMITHBRG 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0004a (2152) : Larrabee-Smithburg 230 kV Line: Reconductor line (~12 miles). Upgrade terminal equipment at Larrabee. Upgrade terminal equipment at Smithburg Project Type : FAC Cost : $96,480,000 Time Estimate : 36.0 Months JCP&L-AF1-F-0004b (2153) : Upgrade terminal equipment at Smithburg Project Type : FAC Cost : $134,000 Time Estimate : 9.0 Months	$96,614,000
41034358	16	28WINDSOR 230.0 kV - CLRKSVLL_1 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0018 (2172) : Windsor-Clarksville 230 kV Line: Reconductor line (~7.5 miles) Replace substation conductor at Windsor. Upgrade terminal equipment at Windsor. Project Type : FAC Cost : $21,440,000 Time Estimate : 30.0 Months	$21,440,000
42768397,42768396	9	28SMITHBRG 230.0 kV - 28E WINDSR 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0014a (2166) : Upgrade terminal equipment at Smithburg Project Type : FAC Cost : $1,340,000 Time Estimate : 12.0 Months JCP&L-AF1-F-0014b (2167) : Upgrade terminal equipment at Smithburg. Replace substation conductor at East Windsor and Smithburg Project Type : FAC Cost : $536,000 Time Estimate : 12.0 Months	$1,876,000
42768372	8	28OCEANVW 230.0 kV - 28LARRABEE 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0010 (2162) : Oceanview-Larrabee 230 kV Line: Reconductor line (~16 miles) Project Type : FAC Cost : $42,880,000 Time Estimate : 30.0 Months	$42,880,000

ID	Index	Facility	Upgrade Description	Cost
42541483,42541484	3	KILMER_W 230.0 kV - LNELSN_W 230.0 kV Ckt 1	**PSEG** r_PS_AE2_FES_KilmerW_LNelsnW (63) : Kilmer-Lake Nelson 230 kV Line: Reconductor 2.0 miles from Lake Nelson to Kilmer with 1590 ACSS, replacing existing 1590 ACSR conductor Project Type : FAC Cost : $5,527,700 Time Estimate : 0.0 Months	$5,527,700
42237051,42237050	18	28R11RINGB 230.0 kV - 28RED OAKB 230.0 kV Ckt 1	**JCPL** JCP&L-AF1-F-0023 (2180) : R11 Ring Bus to Red Oak B 230 kV Line: Reconductor line Project Type : FAC Cost : $1,608,000 Time Estimate : 18.0 Months	$1,608,000
42541457,42541456	2	KILMER_I 230.0 kV - LNELSN_I 230.0 kV Ckt 1	**PSEG** r_PS_AE2_FES_KilmerI_LNelsnI (61) : Kilmer-Lake Nelson 230 kV Line: Reconductor 2.0 miles from Lake Nelson to Kilmer with 1590 ACSS, replacing existing 1590 ACSR conductor Project Type : FAC Cost : $5,527,700 Time Estimate : 0.0 Months	$5,527,700
42236940,42236941	12	28LARRABEE 230.0 kV - 28SMITHBRG 230.0 kV Ckt 2	**JCPL** JCP&L-AF1-F-0005 (2154) : Larrabee-Smthiburg 230 kV #2 Line: Reconductor line (~12 miles). Upgrade terminal equipment at Larrabee and Smithburg. Upgrade terminal equipment at Smithburg Project Type : FAC Cost : $96,480,000 Time Estimate : 30.0 Months	$96,480,000

ID	Index	Facility	Upgrade Description	Cost
42236925,42236926,42541377	1	28RED OAKB 230.0 kV - 28RAR RVR 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0017a (2170) : Red Oak B – Raritan River 230 kV Line: Reconductor line (~4.53 miles) Project Type : FAC Cost : $30,351,000 Time Estimate : 30.0 Months JCP&L-AF1-F-0017b (2171) : Replace substation conductor at Raritan River. Upgrade terminal equipment at Raritan River Project Type : FAC Cost : $536,000 Time Estimate : 12.0 Months	$30,887,000
42237042,42237041	19	28R11RINGA 230.0 kV - 28RED OAKA 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0025 (2181) : R11 Ring A – Red Oak A 230 kV Line: Reconductor line Project Type : FAC Cost : $1,608,000 Time Estimate : 18.0 Months	$1,608,000
42768368,46869220,42237333,46869219,42768367	17	28E WINDSR 230.0 kV - 28WINDSOR 230.0 kV Ckt 1	JCPL JCP&L-AF1-F-0022a (2178) : East Windsor-Windsor 230 kV Line: Reconductor line (~2.53 miles). Upgrade terminal equipment at Windsor Project Type : FAC Cost : $7,584,400 Time Estimate : 24.0 Months JCP&L-AF1-F-0022b (2179) : Upgrade terminal equipment at Windsor Project Type : FAC Cost : $1,005,000 Time Estimate : 12.0 Months	$8,589,400
42237181,42237180	7	28OCEANVW 230.0 kV - 28ATLANTIC 230.0 kV Ckt X	JCPL JCP&L-AF1-F-0008 (2160) : Oceanview-Atlantic 230 kV Line: Reconductor line (~4.6 miles). Upgrade terminal equipment at Atlantic Project Type : FAC Cost : $12,328,000 Time Estimate : 24.0 Months	$12,328,000

ID	Index	Facility	Upgrade Description	Cost
42768576	5	**28LARRABEE 230.0 kV - 28VANHISVL 230.0 kV Ckt 1**	**JCPL** **JCP&L-AF1-F-0006 (2155) : Larrabee-Van Hiseville 230 kV Line: Reconductor line (~9 miles)** **Project Type : FAC** **Cost : $24,120,000** **Time Estimate : 30.0 Months**	$24,120,000
42236931,42236930	15	**28RED OAKA 230.0 kV - 28RAR RVR 230.0 kV Ckt 1**	**JCPL** **JCP&L-AF1-F-0016 (2169) : Red Oak A-Raritan River 230 kV Line: Reconductor line (~4 miles)** **Project Type : FAC** **Cost : $26,800,000** **Time Estimate : 30.0 Months**	$26,800,000
42768537	4	**28ATLANTIC 230.0 kV - 28NEWPROSP 230.0 kV Ckt 1**	**JCPL** **JCP&L-AF1-F-0001 (2150) : Atlantic-New Prospect Road 230 kV Line: Reconductor line (~17.5 miles)** **Project Type : FAC** **Cost : $46,900,000** **Time Estimate : 30.0 Months**	$46,900,000
42237121,42237122	6	**28OCEANVW 230.0 kV - 28ATLANTIC 230.0 kV Ckt Y**	**JCPL** **JCP&L-AF1-F-0009 (2161) : Oceanview-Atlantic 230 kV Circuit Y: Reconductor line (~4.6 miles). Upgrade terminal equipment at Atlantic** **Project Type : FAC** **Cost : $12,328,000** **Time Estimate : 24.0 Months**	$12,328,000
42768575	10	**28NEWPROSP 230.0 kV - 28SMITHBRG 230.0 kV Ckt 1**	**JCPL** **JCP&L-AF1-F-0015 (2168) : New Prospect Road – Smithburg 230 kV Line: Reconductor line (~23.66 miles)** **Project Type : FAC** **Cost : $63,408,800** **Time Estimate : 36.0 Months**	$63,408,800
			TOTAL COST	**$562,874,000**

18 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, 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.

18.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42236925	206315	28RED OAKB	JCP&L	206305	28RAR RVR	JCP&L	1	JC-P2-3-JCC-230-26D	breaker	869.0	172.37	193.58	DC	183.45

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0539
206271	28MCRC/REC	1.9516
206325	**28O C GEN (Deativation : 09/17/18)**	**30.8843**
206327	28S RIV G1	6.3079
206328	28S RIV G2	6.3079
206329	28S RIV G3	8.4026
206358	28PARLN1&2	3.9391
206359	28PARLN3&4	4.7528
206362	28RDOAKCT1	15.7235
206365	28RDOAKST1	22.0489
206367	28LKWD CT2	4.3950
206370	LKWD CT3	31.8427
206412	28R11	270.2744
207143	28BYD_X4-031	0.5121
207144	28HOW_X1-037	0.1906
207145	28FRN_Y2-051	0.0539
207148	28MDF_W3-079	0.0768
207204	28HOL_W1-112	0.0670
207206	28TIN_W1-124	0.2706
207400	28AA1-060 E	1.7131
901032	W1-024E OP1	0.2136
901112	W1-032 E OP1	0.1782
901912	W1-112E OP1	0.7831
901982	W1-119 E	0.6225
901992	W1-120E	0.6225
902032	W1-124E	3.1804
902082	W1-129E	0.3348
902322	W2-019 E	0.3963
902952	W2-082 E OP1	1.1448
903982	W3-079 E	0.9104
905252	W4-025 E	0.4751
907082	X1-037 E	2.2284
907272	X1-085 E	0.2692
912102	X4-015 E	0.3361
914092	Y2-051 E	0.6303
917612	Z2-102 E	0.9178
919662	AA2-048 E	1.4484
920732	AA2-184 E	3.5229
921743	AA2-049 E	0.9087
923292	AB1-138 C	0.5430
923293	AB1-138 E	0.9050

Bus #	Bus	MW Impact
923463	AB1-163 E	0.7350
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**12.2852**
937261	AD2-165	24.5704
939121	AE1-142 C O1	1.2184
939122	AE1-142 E O1	1.7533
939981	AE1-238 C	68.7938
939982	AE1-238 E	180.6983
940161	AE2-000 C O1	31.5025
940162	AE2-000 E O1	80.6041
940401	AE2-024 C O1	30.1208
940402	AE2-024 E O1	141.0225
940411	AE2-025 C	15.2050
940412	AE2-025 E	71.1816
940691	AE2-056 C	0.3354
940692	AE2-056 E	0.2935
940701	AE2-057 C	0.0966
940702	AE2-057 E	0.0966
940921	AE2-081 C	0.3564
940922	AE2-081 E	0.3669
942201	AE2-232 C O1	15.4421
942202	AE2-232 E O1	39.5121
943521	AF1-023	2.5511
943561	AF1-027	0.1009
944332	AF1-101 E O1	41.8828
944611	AF1-126 C O1	2.6719
944612	AF1-126 E O1	10.6877
945571	AF1-222 C	50.4488
945572	AF1-222 E	133.0013
945951	AF1-260	0.2069
945981	AF1-263	0.1792
DUCKCREEK	DUCKCREEK	0.4203
NEWTON	NEWTON	0.3890
FARMERCITY	FARMERCITY	0.0200
NY	NY	1.4704
PRAIRIE	PRAIRIE	0.9195
O-066	O-066	32.0410
COFFEEN	COFFEEN	0.1913
EDWARDS	EDWARDS	0.1285
CHEOAH	CHEOAH	0.1637
TILTON	TILTON	0.2306
G-007	G-007	28.1486
MADISON	MADISON	0.0161
GIBSON	GIBSON	0.1982
CALDERWOOD	CALDERWOOD	0.1630
BLUEG	BLUEG	0.6302
TRIMBLE	TRIMBLE	0.2020
CATAWBA	CATAWBA	0.1050

18.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42541456	218331	KILMER_I	PSE&G	218333	LNELSN_I	PSE&G	1	JC-P1-2-JCC-230-043T	single	805.0	97.77	102.9	DC	41.11

Bus #	Bus	MW Impact
204661	27PORT 5CT	3.0705
206201	28JERSVGEN	0.0596
206271	28MCRC/REC	1.6607
206306	28LKWD G1	1.9016
206308	28LKWD G2	1.9016
206325	**28O C GEN (Deativation : 09/17/18)**	**26.7971**
206327	28S RIV G1	4.6136
206328	28S RIV G2	4.6136
206329	28S RIV G3	6.1456
206350	28RRCT1&2	5.2907
206351	28RRCT3&4	1.8838
206358	28PARLN1&2	2.8518
206359	28PARLN3&4	3.4409
206362	28RDOAKCT1	11.0785
206363	28RDOAKCT2	11.0542
206364	28RDOAKCT3	11.0542
206365	28RDOAKST1	15.5353
206366	28LKWD CT1	3.8328
206367	28LKWD CT2	3.8328
206368	28MDLSEXCO	1.0418
206370	LKWD CT3	27.7695
206403	28W4-009	48.6568
206412	28R11	197.6788
207144	28HOW_X1-037	0.1926
207145	28FRN_Y2-051	0.0473
207148	28MDF_W3-079	0.0672
207152	28NPK_W1-113	0.0733
207162	28APLW2-078	0.0820
207169	28W4-060COL	0.1892
207204	28HOL_W1-112	0.0655
207205	28MAN_W1-024	0.0359
207206	28TIN_W1-124	0.2290
207420	AC1-207 C	0.9640
923292	AB1-138 C	0.4757
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**8.9854**
934841	AD1-113	36.0607
937261	AD2-165	17.9708
939121	AE1-142 C O1	1.0613
939981	AE1-238 C	56.0633
940161	AE2-000 C O1	27.3335
940401	AE2-024 C O1	26.2960

Bus #	Bus	MW Impact
940411	AE2-025 C	13.2742
940691	AE2-056 C	0.3407
940701	AE2-057 C	0.1068
940921	AE2-081 C	0.3620
940931	AE2-082 C	0.6262
942201	AE2-232 C O1	13.3985
943521	AF1-023	2.1706
943561	AF1-027	0.1051
944611	AF1-126 C O1	2.3014
945201	AF1-185 1	2.0754
945211	AF1-186	1.2733
945571	AF1-222 C	41.1131
945951	AF1-260	0.1809
945981	AF1-263	0.1599
DUCKCREEK	DUCKCREEK	0.7404
NEWTON	NEWTON	0.6888
FARMERCITY	FARMERCITY	0.0358
G-007A	G-007A	115.2742
NY	NY	1.7005
PRAIRIE	PRAIRIE	1.6454
COFFEEN	COFFEEN	0.3388
EDWARDS	EDWARDS	0.2254
CHEOAH	CHEOAH	0.3093
TILTON	TILTON	0.4057
MADISON	MADISON	0.0121
GIBSON	GIBSON	0.3505
CALDERWOOD	CALDERWOOD	0.3076
BLUEG	BLUEG	1.1145
TRIMBLE	TRIMBLE	0.3573
CATAWBA	CATAWBA	0.2100

18.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42541483	218332	KILMER_W	PSE&G	218334	LNELSN_W	PSE&G	1	PS_P1-2_I-1023	single	679.0	98.75	103.15	DC	29.84

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0435
206271	28MCRC/REC	1.2044
206306	28LKWD G1	1.4015
206308	28LKWD G2	1.4015
206312	28LKWD G3	1.0309
206325	**28O C GEN (Deativation : 09/17/18)**	**19.8589**
206327	28S RIV G1	3.3028
206328	28S RIV G2	3.3028
206329	28S RIV G3	4.3995
206350	28RRCT1&2	3.7756
206358	28PARLN1&2	2.0426
206359	28PARLN3&4	2.4645
206362	28RDOAKCT1	7.9286
206363	28RDOAKCT2	7.9114
206364	28RDOAKCT3	7.9114
206365	28RDOAKST1	11.1183
206366	28LKWD CT1	2.8248
206367	28LKWD CT2	2.8248
206368	28MDLSEXCO	0.7485
206370	LKWD CT3	24.0780
206403	28W4-009	34.7917
206412	28R11	141.5128
207144	28HOW_X1-037	0.1405
207145	28FRN_Y2-051	0.0347
207148	28MDF_W3-079	0.0493
207152	28NPK_W1-113	0.0540
207162	28APLW2-078	0.0604
207169	28W4-060COL	0.1361
207204	28HOL_W1-112	0.0472
207205	28MAN_W1-024	0.0264
207206	28TIN_W1-124	0.1661
207420	AC1-207 C	0.7063
923292	AB1-138 C	0.3512
923791	AB2-014	0.1361
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**6.4324**
934351	AD1-059	0.2504
934841	AD1-113	25.7850
937261	AD2-165	12.8648
939121	AE1-142 C O1	0.7841
939981	AE1-238 C	40.6912
940161	AE2-000 C O1	20.2565

Bus #	Bus	MW Impact
940401	AE2-024 C O1	19.3556
940411	AE2-025 C	9.7707
940691	AE2-056 C	0.2486
940701	AE2-057 C	0.0779
940921	AE2-081 C	0.2642
940931	AE2-082 C	0.4600
942201	AE2-232 C O1	9.9295
943521	AF1-023	1.5737
943561	AF1-027	0.0788
944611	AF1-126 C O1	1.7324
945201	AF1-185 1	1.4810
945211	AF1-186	0.3751
945571	AF1-222 C	29.8402
945951	AF1-260	0.1328
945981	AF1-263	0.1164
DUCKCREEK	DUCKCREEK	0.4664
NEWTON	NEWTON	0.4319
FARMERCITY	FARMERCITY	0.0224
G-007A	G-007A	82.4261
NY	NY	1.7563
PRAIRIE	PRAIRIE	1.0280
COFFEEN	COFFEEN	0.2125
EDWARDS	EDWARDS	0.1421
CHEOAH	CHEOAH	0.1882
TILTON	TILTON	0.2552
MADISON	MADISON	0.0141
GIBSON	GIBSON	0.2200
CALDERWOOD	CALDERWOOD	0.1874
BLUEG	BLUEG	0.6996
TRIMBLE	TRIMBLE	0.2243
CATAWBA	CATAWBA	0.1246

18.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42768537	206286	28ATLANTIC	JCP&L	206310	28NEWPROSP	JCP&L	1	JC-P7-1-JCC-230-7A	tower	813.0	84.54	105.65	DC	171.42

Bus #	Bus	MW Impact
206271	28MCRC/REC	1.7185
206280	28LAKEHURS	0.4015
206306	28LKWD G1	2.5987
206308	28LKWD G2	2.5987
206312	28LKWD G3	1.9115
206325	**28O C GEN (Deativation : 09/17/18)**	**35.8715**
206360	28O CRK C1	0.8909
206366	28LKWD CT1	5.2379
206367	28LKWD CT2	5.2379
206370	LKWD CT3	44.6460
206412	28R11	53.2090
206414	28X4-005E	1.9956
207143	28BYD_X4-031	0.4456
207145	28FRN_Y2-051	0.0603
207148	28MDF_W3-079	0.0842
207204	28HOL_W1-112	0.0490
207206	28TIN_W1-124	0.2390
207400	28AA1-060 E	1.3954
207419	AB2-139 E	-0.0242
218629	LAKENESP1_E	0.0238
218635	LAKENESP2_E	0.0162
901912	W1-112E OP1	0.5723
901982	W1-119 E	0.6561
901992	W1-120E	0.6561
902032	W1-124E	2.8096
902082	W1-129E	0.3433
902322	W2-019 E	0.4047
902952	W2-082 E OP1	1.1800
903982	W3-079 E	0.9975
905252	W4-025 E	0.4872
905502	W4-060 E OP1	0.7983
907082	X1-037 E	1.2972
907272	X1-085 E	0.1707
912102	X4-015 E	0.3454
914092	Y2-051 E	0.7044
917612	Z2-102 E	0.9669
919662	AA2-048 E	1.5870
920732	AA2-184 E	3.0789
921743	AA2-049 E	0.8027
923292	AB1-138 C	0.7343
923293	AB1-138 E	1.2239

Bus #	Bus	MW Impact
923463	AB1-163 E	0.9589
923791	AB2-014	0.2524
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**2.4186**
930001	AB1-001 C	0.0481
930002	AB1-001 E	0.0791
934351	AD1-059	0.4643
934841	AD1-113	7.4836
937261	AD2-165	4.8372
939121	AE1-142 C O1	1.6830
939122	AE1-142 E O1	2.4219
939981	AE1-238 C	64.2825
939982	AE1-238 E	168.8487
940161	AE2-000 C O1	36.5895
940162	AE2-000 E O1	93.6200
940401	AE2-024 C O1	36.1282
940402	AE2-024 E O1	169.1485
940411	AE2-025 C	18.2375
940412	AE2-025 E	85.3783
940691	AE2-056 C	0.1927
940692	AE2-056 E	0.1686
940701	AE2-057 C	0.0402
940702	AE2-057 E	0.0402
940921	AE2-081 C	0.2047
940922	AE2-081 E	0.2107
942201	AE2-232 C O1	17.9357
942202	AE2-232 E O1	45.8925
943521	AF1-023	2.2295
943561	AF1-027	0.0822
944332	AF1-101 E O1	48.6460
944611	AF1-126 C O1	2.8857
944612	AF1-126 E O1	11.5427
945201	AF1-185 1	0.2291
945571	AF1-222 C	47.1405
945572	AF1-222 E	124.2795
945951	AF1-260	0.2267
945981	AF1-263	0.1560
DUCKCREEK	DUCKCREEK	0.3604
NEWTON	NEWTON	0.3363
FARMERCITY	FARMERCITY	0.0175
G-007A	G-007A	28.1443
NY	NY	0.1454
PRAIRIE	PRAIRIE	0.8085
COFFEEN	COFFEEN	0.1654
EDWARDS	EDWARDS	0.1096
CHEOAH	CHEOAH	0.1567
TILTON	TILTON	0.1972
GIBSON	GIBSON	0.1709
CALDERWOOD	CALDERWOOD	0.1556
BLUEG	BLUEG	0.5434
TRIMBLE	TRIMBLE	0.1742
CATAWBA	CATAWBA	0.1096

18.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42768576	206294	28LARRABEE	JCP&L	206318	28VANHISVL	JCP&L	1	JC-P7-1-JCC-230-11A	tower	869.0	93.73	104.27	DC	91.69

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0334
206271	28MCRC/REC	0.8928
206306	28LKWD G1	2.2899
206308	28LKWD G2	2.2899
206312	28LKWD G3	1.6844
206366	28LKWD CT1	4.6156
206367	28LKWD CT2	4.6156
206368	28MDLSEXCO	0.2904
206370	LKWD CT3	39.3420
206412	28R11	35.9863
206414	28X4-005E	1.4931
206416	28MLH_W1-032	0.0177
207143	28BYD_X4-031	0.2603
207144	28HOW_X1-037	0.1109
207145	28FRN_Y2-051	0.0271
207148	28MDF_W3-079	0.0439
207169	28W4-060COL	0.0590
207204	28HOL_W1-112	0.0275
207205	28MAN_W1-024	0.0233
207206	28TIN_W1-124	0.1251
207401	AA1-060 BAT	4.9378
207419	AB2-139 E	0.0332
207420	AC1-207 C	0.4113
227928	V4-067E	-0.1873
228261	V4-054E	-0.4152
228731	V3-036	-0.6245
901032	W1-024E OP1	0.2744
901112	W1-032 E OP1	0.2148
901422	W1-113 E	0.3482
901912	W1-112E OP1	0.3219
902032	W1-124E	1.4703
902322	W2-019 E	-1.0106
902912	W2-078 E	0.3899
903982	W3-079 E	0.5203
905502	W4-060 E OP1	0.6899
907082	X1-037 E	1.2962
913341	**Y1-077 (Withdrawn : 12/18/2019)**	**-44.5871**
914092	Y2-051 E	0.3170
919662	AA2-048 E	0.8277
920732	AA2-184 E	1.6130

Bus #	Bus	MW Impact
921743	AA2-049 E	0.4201
923791	AB2-014	0.2224
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**1.6357**
927132	AC1-207 E	0.6883
934351	AD1-059	0.4091
934841	AD1-113	5.5992
937261	AD2-165	3.2715
938423	AE1-061 BAT	0.9091
939303	AE1-161 BAT	4.0170
939981	AE1-238 C	34.3823
939982	AE1-238 E	90.3107
940401	AE2-024 C O1	30.5399
940402	AE2-024 E O1	142.9847
940411	AE2-025 C	15.4165
940412	AE2-025 E	72.1721
940691	AE2-056 C	0.1963
940692	AE2-056 E	0.1718
940701	AE2-057 C	0.0599
940702	AE2-057 E	0.0599
940921	AE2-081 C	0.2086
940922	AE2-081 E	0.2147
940931	AE2-082 C	0.3418
940932	AE2-082 E	0.3619
943521	AF1-023	1.1680
944613	AF1-126 BAT	100.4025
945201	AF1-185 1	0.1730
945571	AF1-222 C	25.2137
945572	AF1-222 E	66.4724
945733	AF1-238 BAT	13.2060
945743	AF1-239 BAT	2.5278
945951	AF1-260	0.1182
945981	AF1-263	0.0911
999905	MARINGEN 2	-0.4527
999906	PVILLEG 2	-0.1946
DUCKCREEK	DUCKCREEK	0.0012
NEWTON	NEWTON	0.0054
FARMERCITY	FARMERCITY	0.0005
G-007A	G-007A	21.0572
VFT	VFT	22.3170
WEC	WEC	0.0003
CBM-W1	CBM-W1	0.0876
PRAIRIE	PRAIRIE	0.0284
COFFEEN	COFFEEN	0.0026
CHEOAH	CHEOAH	0.0205
GIBSON	GIBSON	0.0022
CALDERWOOD	CALDERWOOD	0.0199
BLUEG	BLUEG	0.0069
TRIMBLE	TRIMBLE	0.0017
CATAWBA	CATAWBA	0.0245

18.6 Index 6

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
42237121	206300	28OCEANVW	JCP&L	206286	28ATLANTIC	JCP&L	Y	JC-P2-3-JCC-230-47B	breaker	869.0	66.93	133.37	DC	577.31

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.7597
207143	28BYD_X4-031	0.1291
207206	28TIN_W1-124	0.1956
902032	W1-124E	2.2994
903982	W3-079 E	0.2391
919662	AA2-048 E	0.3803
920732	AA2-184 E	1.2286
921743	AA2-049 E	0.6570
939981	AE1-238 C	216.4927
939982	AE1-238 E	568.6543
943521	AF1-023	0.8896
945571	AF1-222 C	158.7613
945572	AF1-222 E	418.5526
945951	AF1-260	0.0288
945981	AF1-263	0.0240
DUCKCREEK	DUCKCREEK	0.0012
NEWTON	NEWTON	0.0011
FARMERCITY	FARMERCITY	0.0001
NY	NY	0.0116
PRAIRIE	PRAIRIE	0.0026
O-066	O-066	0.2352
COFFEEN	COFFEEN	0.0005
EDWARDS	EDWARDS	0.0003
CHEOAH	CHEOAH	0.0005
TILTON	TILTON	0.0006
G-007	G-007	0.1664
GIBSON	GIBSON	0.0005
CALDERWOOD	CALDERWOOD	0.0005
BLUEG	BLUEG	0.0017
TRIMBLE	TRIMBLE	0.0006
CATAWBA	CATAWBA	0.0003

18.7 Index 7

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
42237180	206300	28OCEANVW	JCP&L	206286	28ATLANTIC	JCP&L	X	JC-P2-3-JCC-230-47E	breaker	869.0	82.8	128.95	DC	401.05

Bus #	Bus	MW Impact
206325	**28O C GEN (Deativation : 09/17/18)**	**14.4036**
206370	LKWD CT3	14.9396
206414	28X4-005E	-1.1421
901982	W1-119 E	0.2755
901992	W1-120E	0.2755
902082	W1-129E	0.1465
902322	W2-019 E	0.1731
902952	W2-082 E OP1	0.5019
903982	W3-079 E	0.3027
905252	W4-025 E	0.2079
912102	X4-015 E	0.1472
914092	Y2-051 E	0.2306
917612	Z2-102 E	0.4062
919662	AA2-048 E	0.4815
923292	AB1-138 C	0.2428
923293	AB1-138 E	0.4047
923463	AB1-163 E	0.3088
939121	AE1-142 C O1	0.5670
939122	AE1-142 E O1	0.8159
939981	AE1-238 C	150.3923
939982	AE1-238 E	395.0303
940161	AE2-000 C O1	14.6919
940162	AE2-000 E O1	37.5916
940401	AE2-024 C O1	12.0400
940402	AE2-024 E O1	56.3701
940411	AE2-025 C	6.0778
940412	AE2-025 E	28.4530
942201	AE2-232 C O1	7.2018
942202	AE2-232 E O1	18.4274
944332	AF1-101 E O1	19.5330
944611	AF1-126 C O1	1.2245
944612	AF1-126 E O1	4.8978
945571	AF1-222 C	110.2877
945572	AF1-222 E	290.7584
945951	AF1-260	0.0365
LGEE	LGEE	0.0188
CPLE	CPLE	0.0390
WEC	WEC	0.0098
CBM-W2	CBM-W2	0.3030
NY	NY	0.3700

Bus #	Bus	MW Impact
CBM-W1	CBM-W1	0.3753
TVA	TVA	0.0560
O-066	O-066	8.3395
CBM-S2	CBM-S2	0.3063
CBM-S1	CBM-S1	0.3323
G-007	G-007	6.9857
MADISON	MADISON	0.0040
MEC	MEC	0.0524

18.8 Index 8

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
42768372	206300	28OCEANVW	JCP&L	206294	28LARRABEE	JCP&L	1	JC-P7-1-JCC-230-15	tower	869.0	62.69	124.37	DC	535.99

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.7931
207143	28BYD_X4-031	0.1247
207206	28TIN_W1-124	0.1927
902032	W1-124E	2.2653
920732	AA2-184 E	1.3124
921743	AA2-049 E	0.6472
939981	AE1-238 C	200.9948
939982	AE1-238 E	527.9462
943521	AF1-023	0.9504
945571	AF1-222 C	147.3962
945572	AF1-222 E	388.5899
945981	AF1-263	0.0231
DUCKCREEK	DUCKCREEK	0.0069
NEWTON	NEWTON	0.0064
FARMERCITY	FARMERCITY	0.0003
G-007A	G-007A	2.2225
VFT	VFT	0.8578
PRAIRIE	PRAIRIE	0.0155
COFFEEN	COFFEEN	0.0032
EDWARDS	EDWARDS	0.0021
CHEOAH	CHEOAH	0.0035
TILTON	TILTON	0.0038
GIBSON	GIBSON	0.0033
CALDERWOOD	CALDERWOOD	0.0035
BLUEG	BLUEG	0.0104
TRIMBLE	TRIMBLE	0.0033
CATAWBA	CATAWBA	0.0032

18.9 Index 9

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
42768396	206309	28SMITHBRG	JCP&L	206326	28E WINDSR	JCP&L	1	PS_P7-1_1LINE+2LINE	tower	1394.0	100.27	117.44	DC	239.1

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.1114
206271	28MCRC/REC	2.5721
206306	28LKWD G1	4.3982
206308	28LKWD G2	4.3982
206312	28LKWD G3	3.2351
206325	**28O C GEN (Deativation : 09/17/18)**	**60.6163**
206366	28LKWD CT1	8.8649
206367	28LKWD CT2	8.8649
206368	28MDLSEXCO	1.0581
206370	LKWD CT3	75.5620
206412	28R11	139.9358
206414	28X4-005E	6.2900
206416	28MLH_W1-032	0.0713
207143	28BYD_X4-031	0.7863
207144	28HOW_X1-037	0.3574
207145	28FRN_Y2-051	0.1028
207148	28MDF_W3-079	0.1421
207169	28W4-060COL	0.2028
207204	28HOL_W1-112	0.0830
207205	28MAN_W1-024	0.0876
207206	28TIN_W1-124	0.3539
207400	28AA1-060 E	2.6940
207419	AB2-139 E	0.1062
207420	AC1-207 C	1.4340
901032	W1-024E OP1	1.0320
901112	W1-032 E OP1	0.8634
901422	W1-113 E	0.9141
901912	W1-112E OP1	0.9706
901982	W1-119 E	1.1321
901992	W1-120E	1.1321
902032	W1-124E	4.1601
902082	W1-129E	0.5955
902322	W2-019 E	0.7027
902912	W2-078 E	1.0226
902952	W2-082 E OP1	2.0449
903982	W3-079 E	1.6835
905252	W4-025 E	0.8453
905502	W4-060 E OP1	2.3709
907082	X1-037 E	4.1772
907272	X1-085 E	0.3764
912102	X4-015 E	0.5989
914092	Y2-051 E	1.2012

Bus #	Bus	MW Impact
917612	Z2-102 E	1.6685
919662	AA2-048 E	2.6783
919712	AA2-058 E	-0.0705
920732	AA2-184 E	4.5944
921743	AA2-049 E	1.1886
923292	AB1-138 C	1.0616
923293	AB1-138 E	1.7693
923463	AB1-163 E	1.3907
923791	AB2-014	0.4272
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**6.3607**
927132	AC1-207 E	2.3997
934351	AD1-059	0.7858
934841	AD1-113	23.5875
937261	AD2-165	12.7214
939121	AE1-142 C O1	2.4212
939122	AE1-142 E O1	3.4841
939981	AE1-238 C	89.6625
939982	AE1-238 E	235.5135
940161	AE2-000 C O1	61.8297
940162	AE2-000 E O1	158.2010
940401	AE2-024 C O1	61.1622
940402	AE2-024 E O1	286.3547
940411	AE2-025 C	30.8746
940412	AE2-025 E	144.5386
940691	AE2-056 C	0.6343
940692	AE2-056 E	0.5550
940701	AE2-057 C	0.1996
940702	AE2-057 E	0.1996
940921	AE2-081 C	0.6740
940922	AE2-081 E	0.6938
940931	AE2-082 C	1.0234
940932	AE2-082 E	1.0836
942201	AE2-232 C O1	30.3082
942202	AE2-232 E O1	77.5500
943521	AF1-023	3.3270
943561	AF1-027	0.1586
944332	AF1-101 E O1	82.2030
944611	AF1-126 C O1	4.8445
944612	AF1-126 E O1	19.3778
945201	AF1-185 1	0.7207
945211	AF1-186	0.4730
945571	AF1-222 C	65.7525
945572	AF1-222 E	173.3475
945951	AF1-260	0.3826
945981	AF1-263	0.2752
DUCKCREEK	DUCKCREEK	0.7254
NEWTON	NEWTON	0.6769
FARMERCITY	FARMERCITY	0.0352
G-007A	G-007A	88.7051
NY	NY	0.6404
PRAIRIE	PRAIRIE	1.6247
O-066	O-066	10.1808

Bus #	Bus	MW Impact
COFFEEN	COFFEEN	0.3330
EDWARDS	EDWARDS	0.2205
CHEOAH	CHEOAH	0.3148
TILTON	TILTON	0.3969
GIBSON	GIBSON	0.3440
CALDERWOOD	CALDERWOOD	0.3126
BLUEG	BLUEG	1.0937
TRIMBLE	TRIMBLE	0.3506
CATAWBA	CATAWBA	0.2198

18.10 Index 10

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
42768575	206310	28NEWPROSP	JCP&L	206309	28SMITHBRG	JCP&L	1	JC-P7-1-JCC-230-7A	tower	813.0	80.75	101.87	DC	171.42

Bus #	Bus	MW Impact
206271	28MCRC/REC	1.7185
206280	28LAKEHURS	0.4015
206306	28LKWD G1	2.5987
206308	28LKWD G2	2.5987
206312	28LKWD G3	1.9115
206325	**28O C GEN (Deativation : 09/17/18)**	**35.8715**
206360	28O CRK C1	0.8909
206366	28LKWD CT1	5.2379
206367	28LKWD CT2	5.2379
206370	LKWD CT3	44.6460
206412	28R11	53.2090
206414	28X4-005E	1.9956
207143	28BYD_X4-031	0.4456
207145	28FRN_Y2-051	0.0603
207148	28MDF_W3-079	0.0842
207204	28HOL_W1-112	0.0490
207206	28TIN_W1-124	0.2390
207400	28AA1-060 E	1.3954
207419	AB2-139 E	-0.0242
218629	LAKENESP1_E	0.0238
218635	LAKENESP2_E	0.0162
901912	W1-112E OP1	0.5723
901982	W1-119 E	0.6561
901992	W1-120E	0.6561
902032	W1-124E	2.8096
902082	W1-129E	0.3433
902322	W2-019 E	0.4047
902952	W2-082 E OP1	1.1800
903982	W3-079 E	0.9975
905252	W4-025 E	0.4872
905502	W4-060 E OP1	0.7983
907082	X1-037 E	1.2972
907272	X1-085 E	0.1707
912102	X4-015 E	0.3454
914092	Y2-051 E	0.7044
917612	Z2-102 E	0.9669
919662	AA2-048 E	1.5870
920732	AA2-184 E	3.0789
921743	AA2-049 E	0.8027
923292	AB1-138 C	0.7343
923293	AB1-138 E	1.2239

Bus #	Bus	MW Impact
923463	AB1-163 E	0.9589
923791	AB2-014	0.2524
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**2.4186**
930001	AB1-001 C	0.0481
930002	AB1-001 E	0.0791
934351	AD1-059	0.4643
934841	AD1-113	7.4836
937261	AD2-165	4.8372
939121	AE1-142 C O1	1.6830
939122	AE1-142 E O1	2.4219
939981	AE1-238 C	64.2825
939982	AE1-238 E	168.8487
940161	AE2-000 C O1	36.5895
940162	AE2-000 E O1	93.6200
940401	AE2-024 C O1	36.1282
940402	AE2-024 E O1	169.1485
940411	AE2-025 C	18.2375
940412	AE2-025 E	85.3783
940691	AE2-056 C	0.1927
940692	AE2-056 E	0.1686
940701	AE2-057 C	0.0402
940702	AE2-057 E	0.0402
940921	AE2-081 C	0.2047
940922	AE2-081 E	0.2107
942201	AE2-232 C O1	17.9357
942202	AE2-232 E O1	45.8925
943521	AF1-023	2.2295
943561	AF1-027	0.0822
944332	AF1-101 E O1	48.6460
944611	AF1-126 C O1	2.8857
944612	AF1-126 E O1	11.5427
945201	AF1-185 1	0.2291
945571	AF1-222 C	47.1405
945572	AF1-222 E	124.2795
945951	AF1-260	0.2267
945981	AF1-263	0.1560
DUCKCREEK	DUCKCREEK	0.3604
NEWTON	NEWTON	0.3363
FARMERCITY	FARMERCITY	0.0175
G-007A	G-007A	28.1443
NY	NY	0.1454
PRAIRIE	PRAIRIE	0.8085
COFFEEN	COFFEEN	0.1654
EDWARDS	EDWARDS	0.1096
CHEOAH	CHEOAH	0.1567
TILTON	TILTON	0.1972
GIBSON	GIBSON	0.1709
CALDERWOOD	CALDERWOOD	0.1556
BLUEG	BLUEG	0.5434
TRIMBLE	TRIMBLE	0.1742
CATAWBA	CATAWBA	0.1096

18.11 Index 11

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
42237457	206411	28R11RINGA	JCP&L	206410	28R11RINGB	JCP&L	1	JC-P2-3-JCC-230-85	breaker	999.0	91.89	106.2	DC	142.51

Bus #	Bus	MW Impact
206271	28MCRC/REC	1.4509
206325	**28O C GEN (Deativation : 09/17/18)**	**23.9958**
206327	28S RIV G1	7.1986
206328	28S RIV G2	7.1986
206329	28S RIV G3	9.5891
206358	28PARLN1&2	1.5512
206359	28PARLN3&4	1.8716
206366	28LKWD CT1	3.4074
206367	28LKWD CT2	3.4074
206370	LKWD CT3	24.6874
206412	28R11	308.4400
206414	28X4-005E	-3.4323
207143	28BYD_X4-031	0.3795
207144	28HOW_X1-037	0.1370
207145	28FRN_Y2-051	0.0414
207148	28MDF_W3-079	0.0589
207204	28HOL_W1-112	0.0418
207206	28TIN_W1-124	0.2019
207400	28AA1-060 E	1.3166
901912	W1-112E OP1	0.4886
901982	W1-119 E	0.4828
901992	W1-120E	0.4828
902032	W1-124E	2.3736
902082	W1-129E	0.2597
902322	W2-019 E	0.3074
902952	W2-082 E OP1	0.8879
903982	W3-079 E	0.6977
905252	W4-025 E	0.3685
907082	X1-037 E	1.6010
912102	X4-015 E	0.2607
914092	Y2-051 E	0.4841
917612	Z2-102 E	0.7118
919662	AA2-048 E	1.1100
920732	AA2-184 E	2.6143
921743	AA2-049 E	0.6782
923292	AB1-138 C	0.4200
923293	AB1-138 E	0.7001
923463	AB1-163 E	0.5670
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**14.0200**
937261	AD2-165	28.0400
939121	AE1-142 C O1	0.9452

Bus #	Bus	MW Impact
939122	AE1-142 E O1	1.3602
939981	AE1-238 C	53.4420
939982	AE1-238 E	140.3743
940161	AE2-000 C O1	24.4762
940162	AE2-000 E O1	62.6261
940401	AE2-024 C O1	23.3450
940402	AE2-024 E O1	109.2989
940411	AE2-025 C	11.7846
940412	AE2-025 E	55.1691
940691	AE2-056 C	0.2406
940692	AE2-056 E	0.2105
940701	AE2-057 C	0.0571
940702	AE2-057 E	0.0571
940921	AE2-081 C	0.2557
940922	AE2-081 E	0.2632
942201	AE2-232 C O1	11.9979
942202	AE2-232 E O1	30.6993
943521	AF1-023	1.8931
943561	AF1-027	0.0775
944332	AF1-101 E O1	32.5412
944611	AF1-126 C O1	2.0865
944612	AF1-126 E O1	8.3460
945571	AF1-222 C	39.1908
945572	AF1-222 E	103.3212
945951	AF1-260	0.1586
945981	AF1-263	0.1328
DUCKCREEK	DUCKCREEK	0.0610
NEWTON	NEWTON	0.0537
CPLE	CPLE	0.0093
FARMERCITY	FARMERCITY	0.0027
NY	NY	0.9871
PRAIRIE	PRAIRIE	0.1188
O-066	O-066	22.7136
COFFEEN	COFFEEN	0.0264
EDWARDS	EDWARDS	0.0189
CHEOAH	CHEOAH	0.0120
TILTON	TILTON	0.0340
G-007	G-007	20.9986
MADISON	MADISON	0.0121
GIBSON	GIBSON	0.0278
CALDERWOOD	CALDERWOOD	0.0124
BLUEG	BLUEG	0.0885
TRIMBLE	TRIMBLE	0.0289
CATAWBA	CATAWBA	0.0010

18.12 Index 12

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
42236940	206294	28LARRABEE	JCP&L	206309	28SMITHBRG	JCP&L	2	JC-P2-3-JCC-230-15F	breaker	813.0	151.59	158.43	DC	122.8

Bus #	Bus	MW Impact
206271	28MCRC/REC	1.0493
206280	28LAKEHURS	0.6158
206306	28LKWD G1	4.1222
206308	28LKWD G2	4.1222
206312	28LKWD G3	3.0321
206325	**28O C GEN (Deativation : 09/17/18)**	**57.1482**
206360	28O CRK C1	1.4194
206366	28LKWD CT1	8.3086
206367	28LKWD CT2	8.3086
206370	LKWD CT3	70.8200
206412	28R11	29.8639
207143	28BYD_X4-031	0.3422
207145	28FRN_Y2-051	0.0829
207148	28MDF_W3-079	0.1163
207400	28AA1-060 E	2.3313
207419	AB2-139 E	-0.0283
227928	V4-067E	0.1280
228100	BLE DIES	0.5246
228731	V3-036	0.4249
901912	W1-112E OP1	0.3007
901982	W1-119 E	1.0467
901992	W1-120E	1.0467
902032	W1-124E	1.6916
902082	W1-129E	0.5492
902322	W2-019 E	0.6477
902432	W2-030 E	0.4539
902952	W2-082 E OP1	1.8866
903982	W3-079 E	1.3781
905252	W4-025 E	0.7795
905502	W4-060 E OP1	0.4475
907082	X1-037 E	1.2618
907272	X1-085 E	0.3021
912102	X4-015 E	0.5524
913341	**Y1-077 (Withdrawn : 12/18/2019)**	**29.3131**
914092	Y2-051 E	0.9694
917612	Z2-102 E	1.5425
919662	AA2-048 E	2.1924
920732	AA2-184 E	1.8269
921743	AA2-049 E	0.4833
923292	AB1-138 C	1.1265

Bus #	Bus	MW Impact
923293	AB1-138 E	1.8775
923463	AB1-163 E	1.2211
923791	AB2-014	0.4004
924701	AB2-122 C	0.0553
924702	AB2-122 E	0.0948
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**1.3575**
930001	AB1-001 C	0.0817
930002	AB1-001 E	0.1342
933962	AD1-019 E	0.5871
934351	AD1-059	0.7365
937261	AD2-165	2.7149
938781	AE1-104 C O1	7.9611
938782	AE1-104 E O1	20.3684
939121	AE1-142 C O1	2.6644
939122	AE1-142 E O1	3.8342
939981	AE1-238 C	39.1412
939982	AE1-238 E	102.8110
940161	AE2-000 C O1	58.2922
940162	AE2-000 E O1	149.1497
940361	AE2-020 C	4.7165
940362	AE2-020 E	22.0829
940371	AE2-021 C	4.7165
940372	AE2-021 E	22.0829
940381	AE2-022 C	2.7513
940382	AE2-022 E	12.8817
940391	AE2-023 C	5.1387
940392	AE2-023 E	24.0565
940401	AE2-024 C O1	57.3218
940402	AE2-024 E O1	268.3744
940411	AE2-025 C	28.9360
940412	AE2-025 E	135.4630
940691	AE2-056 C	0.1883
940692	AE2-056 E	0.1647
940701	AE2-057 C	0.0348
940702	AE2-057 E	0.0348
940921	AE2-081 C	0.2000
940922	AE2-081 E	0.2059
942101	AE2-222 C O1	6.6356
942102	AE2-222 E O1	16.6689
942201	AE2-232 C O1	28.5741
942202	AE2-232 E O1	73.1131
942381	AE2-251 C	28.1919
942382	AE2-251 E	72.1353
942941	**AE2-314 C (Withdrawn : 12/16/2019)**	**3.6118**
942942	**AE2-314 E (Withdrawn : 12/16/2019)**	**2.4079**
943521	AF1-023	0.7011
943561	AF1-027	0.1373
943732	AF1-041 E	0.0997
944332	AF1-101 E O1	77.4999
944611	AF1-126 C O1	4.6658
944612	AF1-126 E O1	18.6633
945571	AF1-222 C	15.2129

Bus #	Bus	MW Impact
945572	AF1-222 E	40.1067
945951	AF1-260	0.3132
945981	AF1-263	0.0635
999905	MARINGEN 2	0.3078
999906	PVILLEG 2	0.1327
DUCKCREEK	DUCKCREEK	0.3765
NEWTON	NEWTON	0.3492
FARMERCITY	FARMERCITY	0.0181
G-007A	G-007A	15.1450
NY	NY	0.5685
PRAIRIE	PRAIRIE	0.8369
O-066	O-066	6.0144
COFFEEN	COFFEEN	0.1723
EDWARDS	EDWARDS	0.1144
CHEOAH	CHEOAH	0.1572
TILTON	TILTON	0.2060
MADISON	MADISON	0.0060
GIBSON	GIBSON	0.1780
CALDERWOOD	CALDERWOOD	0.1561
BLUEG	BLUEG	0.5659
TRIMBLE	TRIMBLE	0.1814
CATAWBA	CATAWBA	0.1067

18.13 Index 13

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42236945	206294	28LARRABEE	JCP&L	206309	28SMITHBRG	JCP&L	1	JC-P2-3-JCC-230-15G	breaker	817.0	150.85	157.65	DC	122.8

Bus #	Bus	MW Impact
206271	28MCRC/REC	1.0493
206280	28LAKEHURS	0.6158
206306	28LKWD G1	4.1222
206308	28LKWD G2	4.1222
206312	28LKWD G3	3.0321
206325	**28O C GEN (Deativation : 09/17/18)**	**57.1482**
206360	28O CRK C1	1.4194
206366	28LKWD CT1	8.3086
206367	28LKWD CT2	8.3086
206370	LKWD CT3	70.8200
206412	28R11	29.8639
207143	28BYD_X4-031	0.3422
207145	28FRN_Y2-051	0.0829
207148	28MDF_W3-079	0.1163
207400	28AA1-060 E	2.3313
207419	AB2-139 E	-0.0283
227928	V4-067E	0.1280
228100	BLE DIES	0.5246
228731	V3-036	0.4249
901912	W1-112E OP1	0.3007
901982	W1-119 E	1.0467
901992	W1-120E	1.0467
902032	W1-124E	1.6916
902082	W1-129E	0.5492
902322	W2-019 E	0.6477
902432	W2-030 E	0.4539
902952	W2-082 E OP1	1.8866
903982	W3-079 E	1.3781
905252	W4-025 E	0.7795
905502	W4-060 E OP1	0.4475
907082	X1-037 E	1.2618
907272	X1-085 E	0.3021
912102	X4-015 E	0.5524
913341	**Y1-077 (Withdrawn : 12/18/2019)**	**29.3131**
914092	Y2-051 E	0.9694
917612	Z2-102 E	1.5425
919662	AA2-048 E	2.1924
920732	AA2-184 E	1.8269
921743	AA2-049 E	0.4833
923292	AB1-138 C	1.1265

Bus #	Bus	MW Impact
923293	AB1-138 E	1.8775
923463	AB1-163 E	1.2211
923791	AB2-014	0.4004
924701	AB2-122 C	0.0553
924702	AB2-122 E	0.0948
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**1.3575**
930001	AB1-001 C	0.0817
930002	AB1-001 E	0.1342
933962	AD1-019 E	0.5871
934351	AD1-059	0.7365
937261	AD2-165	2.7149
938781	AE1-104 C O1	7.9611
938782	AE1-104 E O1	20.3684
939121	AE1-142 C O1	2.6644
939122	AE1-142 E O1	3.8342
939981	AE1-238 C	39.1412
939982	AE1-238 E	102.8110
940161	AE2-000 C O1	58.2922
940162	AE2-000 E O1	149.1497
940361	AE2-020 C	4.7165
940362	AE2-020 E	22.0829
940371	AE2-021 C	4.7165
940372	AE2-021 E	22.0829
940381	AE2-022 C	2.7513
940382	AE2-022 E	12.8817
940391	AE2-023 C	5.1387
940392	AE2-023 E	24.0565
940401	AE2-024 C O1	57.3218
940402	AE2-024 E O1	268.3744
940411	AE2-025 C	28.9360
940412	AE2-025 E	135.4630
940691	AE2-056 C	0.1883
940692	AE2-056 E	0.1647
940701	AE2-057 C	0.0348
940702	AE2-057 E	0.0348
940921	AE2-081 C	0.2000
940922	AE2-081 E	0.2059
942101	AE2-222 C O1	6.6356
942102	AE2-222 E O1	16.6689
942201	AE2-232 C O1	28.5741
942202	AE2-232 E O1	73.1131
942381	AE2-251 C	28.1919
942382	AE2-251 E	72.1353
942941	**AE2-314 C (Withdrawn : 12/16/2019)**	**3.6118**
942942	**AE2-314 E (Withdrawn : 12/16/2019)**	**2.4079**
943521	AF1-023	0.7011
943561	AF1-027	0.1373
943732	AF1-041 E	0.0997
944332	AF1-101 E O1	77.4999
944611	AF1-126 C O1	4.6658
944612	AF1-126 E O1	18.6633
945571	AF1-222 C	15.2129

Bus #	Bus	MW Impact
945572	AF1-222 E	40.1067
945951	AF1-260	0.3132
945981	AF1-263	0.0635
999905	MARINGEN 2	0.3078
999906	PVILLEG 2	0.1327
DUCKCREEK	DUCKCREEK	0.3765
NEWTON	NEWTON	0.3492
FARMERCITY	FARMERCITY	0.0181
G-007A	G-007A	15.1450
NY	NY	0.5685
PRAIRIE	PRAIRIE	0.8369
O-066	O-066	6.0144
COFFEEN	COFFEEN	0.1723
EDWARDS	EDWARDS	0.1144
CHEOAH	CHEOAH	0.1572
TILTON	TILTON	0.2060
MADISON	MADISON	0.0060
GIBSON	GIBSON	0.1780
CALDERWOOD	CALDERWOOD	0.1561
BLUEG	BLUEG	0.5659
TRIMBLE	TRIMBLE	0.1814
CATAWBA	CATAWBA	0.1067

18.14 Index 14

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
49863000	206302	28OYSTER C	JCP&L	227955	CEDAR	AE	1	JC-P7-1-JCC-230-7A	tower	564.0	144.77	150.05	DC	66.07

Bus #	Bus	MW Impact
206271	28MCRC/REC	0.5902
206280	28LAKEHURS	0.3610
206306	28LKWD G1	2.0983
206308	28LKWD G2	2.0983
206312	28LKWD G3	1.5434
206325	**28O C GEN (Deativation : 09/17/18)**	**65.7540**
206360	28O CRK C1	1.3882
206361	28O CRK C2	0.9321
206366	28LKWD CT1	4.2294
206367	28LKWD CT2	4.2294
206370	LKWD CT3	30.6425
206412	28R11	23.3974
207143	28BYD_X4-031	0.1915
207400	28AA1-060 E	1.2979
227928	V4-067E	-0.2741
228261	V4-054E	-0.4141
228731	V3-036	-0.9062
901912	W1-112E OP1	0.1897
901982	W1-119 E	0.5407
901992	W1-120E	0.5407
902032	W1-124E	0.9501
902082	W1-129E	0.2647
902322	W2-019 E	0.3087
902952	W2-082 E OP1	0.9214
903982	W3-079 E	0.5438
905252	W4-025 E	0.3757
905502	W4-060 E OP1	0.3769
907082	X1-037 E	0.8948
907272	X1-085 E	0.1999
912102	X4-015 E	0.2677
913341	**Y1-077 (Withdrawn : 12/18/2019)**	**-61.3733**
914092	Y2-051 E	0.4004
917612	Z2-102 E	0.7957
919662	AA2-048 E	0.8651
920732	AA2-184 E	1.0375
921743	AA2-049 E	0.2714
923292	AB1-138 C	0.6603
923293	AB1-138 E	1.1006
923463	AB1-163 E	0.6347
923791	AB2-014	0.2038
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**1.0635**

Bus #	Bus	MW Impact
934351	AD1-059	0.3749
937261	AD2-165	2.1270
938423	AE1-061 BAT	0.9855
939121	AE1-142 C O1	1.7933
939122	AE1-142 E O1	2.5807
939303	AE1-161 BAT	3.7430
939981	AE1-238 C	21.0604
939982	AE1-238 E	55.3188
940161	AE2-000 C O1	67.0702
940162	AE2-000 E O1	171.6097
940401	AE2-024 C O1	20.6468
940402	AE2-024 E O1	96.6662
940411	AE2-025 C	10.4225
940412	AE2-025 E	48.7927
940691	AE2-056 C	0.1351
940692	AE2-056 E	0.1182
940701	AE2-057 C	0.0360
940702	AE2-057 E	0.0360
940921	AE2-081 C	0.1436
940922	AE2-081 E	0.1478
942201	AE2-232 C O1	32.8770
942202	AE2-232 E O1	84.1230
943521	AF1-023	0.3982
943561	AF1-027	0.0764
944332	AF1-101 E O1	168.2460
944611	AF1-126 C O1	1.9498
944612	AF1-126 E O1	7.7991
945571	AF1-222 C	8.1855
945572	AF1-222 E	21.5799
945733	AF1-238 BAT	15.1605
945743	AF1-239 BAT	2.7018
945951	AF1-260	0.0655
945981	AF1-263	0.0355
999905	MARINGEN 2	-0.6561
999906	PVILLEG 2	-0.2832
DUCKCREEK	DUCKCREEK	0.0795
NEWTON	NEWTON	0.0774
FARMERCITY	FARMERCITY	0.0041
G-007A	G-007A	13.3733
VFT	VFT	11.0811
PRAIRIE	PRAIRIE	0.1911
COFFEEN	COFFEEN	0.0375
EDWARDS	EDWARDS	0.0242
CHEOAH	CHEOAH	0.0455
TILTON	TILTON	0.0435
GIBSON	GIBSON	0.0388
CALDERWOOD	CALDERWOOD	0.0447
BLUEG	BLUEG	0.1233
TRIMBLE	TRIMBLE	0.0395
CATAWBA	CATAWBA	0.0374

18.15 Index 15

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
42236930	206314	28RED OAKA	JCP&L	206305	28RAR RVR	JCP&L	1	JC-P2-3-JCC-230-26B	breaker	869.0	168.67	189.97	DC	184.33

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0540
206271	28MCRC/REC	1.9581
206325	**28O C GEN (Deativation : 09/17/18)**	**31.0524**
206327	28S RIV G1	6.4412
206328	28S RIV G2	6.4412
206329	28S RIV G3	8.5801
206358	28PARLN1&2	3.8866
206359	28PARLN3&4	4.6894
206363	28RDOAKCT2	15.6917
206364	28RDOAKCT3	15.6917
206367	28LKWD CT2	4.4180
206370	LKWD CT3	32.0093
206412	28R11	275.9856
207143	28BYD_X4-031	0.5139
207144	28HOW_X1-037	0.1912
207145	28FRN_Y2-051	0.0542
207148	28MDF_W3-079	0.0772
207204	28HOL_W1-112	0.0669
207206	28TIN_W1-124	0.2715
207400	28AA1-060 E	1.7234
901032	W1-024E OP1	0.2147
901112	W1-032 E OP1	0.1792
901912	W1-112E OP1	0.7815
901982	W1-119 E	0.6260
901992	W1-120E	0.6260
902032	W1-124E	3.1915
902082	W1-129E	0.3367
902322	W2-019 E	0.3986
902952	W2-082 E OP1	1.1514
903982	W3-079 E	0.9147
905252	W4-025 E	0.4779
907082	X1-037 E	2.2347
907272	X1-085 E	0.2709
912102	X4-015 E	0.3380
914092	Y2-051 E	0.6333
917612	Z2-102 E	0.9230
919662	AA2-048 E	1.4552
920732	AA2-184 E	3.5345
921743	AA2-049 E	0.9119
923292	AB1-138 C	0.5459
923293	AB1-138 E	0.9098

Bus #	Bus	MW Impact
923463	AB1-163 E	0.7388
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**12.5448**
937261	AD2-165	25.0896
939121	AE1-142 C O1	1.2249
939122	AE1-142 E O1	1.7627
939981	AE1-238 C	69.1245
939982	AE1-238 E	181.5670
940161	AE2-000 C O1	31.6740
940162	AE2-000 E O1	81.0429
940401	AE2-024 C O1	30.2776
940402	AE2-024 E O1	141.7565
940411	AE2-025 C	15.2841
940412	AE2-025 E	71.5521
940691	AE2-056 C	0.3364
940692	AE2-056 E	0.2943
940701	AE2-057 C	0.0968
940702	AE2-057 E	0.0968
940921	AE2-081 C	0.3574
940922	AE2-081 E	0.3679
942201	AE2-232 C O1	15.5262
942202	AE2-232 E O1	39.7272
943521	AF1-023	2.5595
943561	AF1-027	0.1015
944332	AF1-101 E O1	42.1108
944611	AF1-126 C O1	2.6879
944612	AF1-126 E O1	10.7516
945571	AF1-222 C	50.6913
945572	AF1-222 E	133.6407
945951	AF1-260	0.2079
945981	AF1-263	0.1799
DUCKCREEK	DUCKCREEK	0.3950
NEWTON	NEWTON	0.3643
FARMERCITY	FARMERCITY	0.0188
NY	NY	1.4627
PRAIRIE	PRAIRIE	0.8601
O-066	O-066	32.0006
COFFEEN	COFFEEN	0.1792
EDWARDS	EDWARDS	0.1204
CHEOAH	CHEOAH	0.1522
TILTON	TILTON	0.2161
G-007	G-007	28.2318
MADISON	MADISON	0.0161
GIBSON	GIBSON	0.1856
CALDERWOOD	CALDERWOOD	0.1516
BLUEG	BLUEG	0.5902
TRIMBLE	TRIMBLE	0.1892
CATAWBA	CATAWBA	0.0966

18.16 Index 16

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
41034358	206316	28WINDSOR	JCP&L	219752	CLRKSVLL_1	PSE&G	1	PS_P7-1_I1023+GBK-LN_LT	tower	813.0	123.92	136.99	DC	106.09

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0525
206271	28MCRC/REC	1.1487
206325	**28O C GEN (Deativation : 09/17/18)**	**26.8926**
206327	28S RIV G1	1.7571
206328	28S RIV G2	1.7571
206329	28S RIV G3	2.3406
206358	28PARLN1&2	1.1214
206359	28PARLN3&4	1.3530
206363	28RDOAKCT2	4.1510
206364	28RDOAKCT3	4.1510
206368	28MDLSEXCO	0.4999
206370	LKWD CT3	28.2200
206412	28R11	75.2884
206414	28X4-005E	2.8905
206416	28MLH_W1-032	0.0314
207143	28BYD_X4-031	0.3542
207144	28HOW_X1-037	0.1651
207145	28FRN_Y2-051	0.0454
207149	28UPF_X1-085	0.0455
207152	28NPK_W1-113	0.0997
207162	28APLW2-078	0.1116
207169	28W4-060COL	0.0945
207204	28HOL_W1-112	0.0375
207205	28MAN_W1-024	0.0435
207206	28TIN_W1-124	0.1580
207400	28AA1-060 E	2.2869
207419	AB2-139 E	0.0931
207420	AC1-207 C	1.0393
219679	NRGCENTER E	-0.3235
901032	W1-024E OP1	0.5126
901112	W1-032 E OP1	0.3802
901422	W1-113 E	1.1752
901912	W1-112E OP1	0.4386
901982	W1-119 E	0.5765
901992	W1-120E	0.5765
902032	W1-124E	1.8566
902082	W1-129E	0.3143
902322	W2-019 E	0.3729
902912	W2-078 E	1.3165
902952	W2-082 E OP1	1.0722
903982	W3-079 E	0.6356

Bus #	Bus	MW Impact
905252	W4-025 E	0.4461
905502	W4-060 E OP1	1.1047
907082	X1-037 E	1.9302
907272	X1-085 E	0.5323
912102	X4-015 E	0.3153
914092	Y2-051 E	0.5308
917612	Z2-102 E	0.8503
919662	AA2-048 E	1.0111
919712	AA2-058 E	-0.1732
919802	AA2-066 E	-0.3235
920732	AA2-184 E	2.0526
921743	AA2-049 E	0.5305
923292	AB1-138 C	0.4745
923293	AB1-138 E	0.7908
923463	AB1-163 E	0.6403
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**3.4222**
927132	AC1-207 E	1.7393
934841	AD1-113	10.8394
937261	AD2-165	6.8444
937523	AD2-213 BAT	1.7904
939121	AE1-142 C O1	1.0695
939122	AE1-142 E O1	1.5391
939981	AE1-238 C	39.7822
939982	AE1-238 E	104.4947
940161	AE2-000 C O1	27.4309
940162	AE2-000 E O1	70.1863
940401	AE2-024 C O1	26.8222
940402	AE2-024 E O1	125.5786
940411	AE2-025 C	13.5398
940412	AE2-025 E	63.3863
940691	AE2-056 C	0.2934
940692	AE2-056 E	0.2567
940701	AE2-057 C	0.0940
940702	AE2-057 E	0.0940
940921	AE2-081 C	0.3117
940922	AE2-081 E	0.3209
940931	AE2-082 C	0.7221
940932	AE2-082 E	0.7645
942201	AE2-232 C O1	13.4463
942202	AE2-232 E O1	34.4053
943521	AF1-023	1.4864
943561	AF1-027	0.1347
944332	AF1-101 E O1	36.4696
944432	AF1-108 BAT	1.8538
944442	AF1-109 BAT	5.4732
944611	AF1-126 C O1	2.0773
944612	AF1-126 E O1	8.3090
945201	AF1-185 1	0.3310
945571	AF1-222 C	29.1736
945572	AF1-222 E	76.9123
945723	AF1-237 BAT	39.3160
945951	AF1-260	0.0766

Bus #	Bus	MW Impact
945981	AF1-263	0.1240
DUCKCREEK	DUCKCREEK	0.2556
NEWTON	NEWTON	0.2396
FARMERCITY	FARMERCITY	0.0125
G-007A	G-007A	40.7647
NY	NY	0.1421
PRAIRIE	PRAIRIE	0.5760
O-066	O-066	5.8128
COFFEEN	COFFEEN	0.1179
EDWARDS	EDWARDS	0.0777
CHEOAH	CHEOAH	0.1116
TILTON	TILTON	0.1399
GIBSON	GIBSON	0.1212
CALDERWOOD	CALDERWOOD	0.1108
BLUEG	BLUEG	0.3854
TRIMBLE	TRIMBLE	0.1235
CATAWBA	CATAWBA	0.0784

18.17 Index 17

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
42768367	206326	28E WINDSR	JCP&L	206316	28WINDSOR	JCP&L	1	PS_P7-1_1LINE+2LINE	tower	869.0	120.11	131.06	DC	95.06

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0408
206271	28MCRC/REC	1.0133
206306	28LKWD G1	1.7721
206308	28LKWD G2	1.7721
206312	28LKWD G3	1.3035
206325	**28O C GEN (Deativation : 09/17/18)**	**24.5576**
206359	28PARLN3&4	1.1309
206366	28LKWD CT1	3.5719
206367	28LKWD CT2	3.5719
206370	LKWD CT3	30.4460
206412	28R11	53.2389
206414	28X4-005E	2.3751
206416	28MLH_W1-032	0.0289
207143	28BYD_X4-031	0.3058
207144	28HOW_X1-037	0.1343
207145	28FRN_Y2-051	0.0410
207148	28MDF_W3-079	0.0561
207204	28HOL_W1-112	0.0322
207206	28TIN_W1-124	0.1396
219679	NRGCENTER E	-0.3140
901032	W1-024E OP1	0.2949
901112	W1-032 E OP1	0.3497
901912	W1-112E OP1	0.3763
902032	W1-124E	1.6405
903982	W3-079 E	0.6650
905502	W4-060 E OP1	0.7471
907082	X1-037 E	1.5694
914092	Y2-051 E	0.4790
919662	AA2-048 E	1.0580
919712	AA2-058 E	-0.1687
919802	AA2-066 E	-0.3140
920732	AA2-184 E	1.8093
921743	AA2-049 E	0.4687
923292	AB1-138 C	0.4145
923293	AB1-138 E	0.6908
923463	AB1-163 E	0.5106
923791	AB2-014	0.1721
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**2.4200**
934351	AD1-059	0.3166
934841	AD1-113	8.9065
937261	AD2-165	4.8399
937523	AD2-213 BAT	1.7324

Bus #	Bus	MW Impact
939121	AE1-142 C O1	0.9709
939122	AE1-142 E O1	1.3972
939981	AE1-238 C	35.6490
939982	AE1-238 E	93.6380
940161	AE2-000 C O1	25.0492
940162	AE2-000 E O1	64.0923
940401	AE2-024 C O1	24.6536
940402	AE2-024 E O1	115.4256
940411	AE2-025 C	12.4451
940412	AE2-025 E	58.2615
940691	AE2-056 C	0.2380
940692	AE2-056 E	0.2082
940701	AE2-057 C	0.0730
940702	AE2-057 E	0.0730
940921	AE2-081 C	0.2529
940922	AE2-081 E	0.2603
940931	AE2-082 C	0.2162
940932	AE2-082 E	0.2289
942201	AE2-232 C O1	12.2788
942202	AE2-232 E O1	31.4180
943521	AF1-023	1.3101
944332	AF1-101 E O1	33.3031
944432	AF1-108 BAT	1.7934
944442	AF1-109 BAT	5.3352
944611	AF1-126 C O1	1.7092
944612	AF1-126 E O1	6.8368
945201	AF1-185 1	0.2719
945571	AF1-222 C	26.1426
945572	AF1-222 E	68.9214
945723	AF1-237 BAT	38.3180
945951	AF1-260	0.1511
945981	AF1-263	0.1070
DUCKCREEK	DUCKCREEK	0.2015
NEWTON	NEWTON	0.1880
FARMERCITY	FARMERCITY	0.0098
G-007A	G-007A	33.4955
NY	NY	0.1040
PRAIRIE	PRAIRIE	0.4520
O-066	O-066	5.5104
COFFEEN	COFFEEN	0.0925
EDWARDS	EDWARDS	0.0609
CHEOAH	CHEOAH	0.0876
TILTON	TILTON	0.1103
GIBSON	GIBSON	0.0956
CALDERWOOD	CALDERWOOD	0.0870
BLUEG	BLUEG	0.3038
TRIMBLE	TRIMBLE	0.0974
CATAWBA	CATAWBA	0.0616

18.18 Index 18

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
42237050	206410	28R11RINGB	JCP&L	206315	28RED OAKB	JCP&L	1	JC-P2-3-JCC-230-26D	breaker	869.0	127.75	149.07	DC	184.81

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0546
206271	28MCRC/REC	1.9663
206325	**28O C GEN (Deativation : 09/17/18)**	**31.3180**
206327	28S RIV G1	6.3311
206328	28S RIV G2	6.3311
206329	28S RIV G3	8.4335
206358	28PARLN1&2	3.9539
206359	28PARLN3&4	4.7707
206366	28LKWD CT1	4.4483
206367	28LKWD CT2	4.4483
206370	LKWD CT3	32.2286
206412	28R11	271.2688
207143	28BYD_X4-031	0.5167
207144	28HOW_X1-037	0.1927
207145	28FRN_Y2-051	0.0545
207148	28MDF_W3-079	0.0777
207204	28HOL_W1-112	0.0675
207206	28TIN_W1-124	0.2726
207400	28AA1-060 E	1.7479
901032	W1-024E OP1	0.2184
901112	W1-032 E OP1	0.1818
901912	W1-112E OP1	0.7887
901982	W1-119 E	0.6330
901992	W1-120E	0.6330
902032	W1-124E	3.2043
902082	W1-129E	0.3407
902322	W2-019 E	0.4035
902952	W2-082 E OP1	1.1651
903982	W3-079 E	0.9203
905252	W4-025 E	0.4836
905502	W4-060 E OP1	0.5071
907082	X1-037 E	2.2523
907272	X1-085 E	0.2752
912102	X4-015 E	0.3421
914092	Y2-051 E	0.6373
917612	Z2-102 E	0.9333
919662	AA2-048 E	1.4642
920732	AA2-184 E	3.5493
921743	AA2-049 E	0.9155
923292	AB1-138 C	0.5500
923293	AB1-138 E	0.9166

Bus #	Bus	MW Impact
923463	AB1-163 E	0.7447
925541	**AC1-029 (Withdrawn : 11/27/2019)**	**12.3304**
937261	AD2-165	24.6608
939121	AE1-142 C O1	1.2342
939122	AE1-142 E O1	1.7761
939981	AE1-238 C	69.3045
939982	AE1-238 E	182.0398
940161	AE2-000 C O1	31.9449
940162	AE2-000 E O1	81.7361
940401	AE2-024 C O1	30.4732
940402	AE2-024 E O1	142.6722
940411	AE2-025 C	15.3829
940412	AE2-025 E	72.0144
940691	AE2-056 C	0.3390
940692	AE2-056 E	0.2967
940701	AE2-057 C	0.0977
940702	AE2-057 E	0.0977
940921	AE2-081 C	0.3602
940922	AE2-081 E	0.3708
942201	AE2-232 C O1	15.6590
942202	AE2-232 E O1	40.0670
943521	AF1-023	2.5701
943561	AF1-027	0.1029
944332	AF1-101 E O1	42.4710
944611	AF1-126 C O1	2.7230
944612	AF1-126 E O1	10.8922
945571	AF1-222 C	50.8233
945572	AF1-222 E	133.9887
945951	AF1-260	0.2092
945981	AF1-263	0.1808
DUCKCREEK	DUCKCREEK	0.1589
NEWTON	NEWTON	0.1451
FARMERCITY	FARMERCITY	0.0073
NY	NY	1.3438
PRAIRIE	PRAIRIE	0.3332
O-066	O-066	30.5155
COFFEEN	COFFEEN	0.0713
EDWARDS	EDWARDS	0.0490
CHEOAH	CHEOAH	0.0501
TILTON	TILTON	0.0876
G-007	G-007	27.9126
MADISON	MADISON	0.0161
GIBSON	GIBSON	0.0743
CALDERWOOD	CALDERWOOD	0.0502
BLUEG	BLUEG	0.2361
TRIMBLE	TRIMBLE	0.0757
CATAWBA	CATAWBA	0.0256

18.19 Index 19

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
42237041	206411	28R11RINGA	JCP&L	206314	28RED OAKA	JCP&L	1	JC-P2-3-JCC-230-26B	breaker	869.0	131.56	152.96	DC	185.47

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0546
206271	28MCRC/REC	1.9704
206325	**28O C GEN (Deativation : 09/17/18)**	**31.4136**
206327	28S RIV G1	6.4606
206328	28S RIV G2	6.4606
206329	28S RIV G3	8.6060
206358	28PARLN1&2	3.8989
206359	28PARLN3&4	4.7043
206366	28LKWD CT1	4.4624
206367	28LKWD CT2	4.4624
206370	LKWD CT3	32.3306
206412	28R11	276.8172
207143	28BYD_X4-031	0.5177
207144	28HOW_X1-037	0.1929
207145	28FRN_Y2-051	0.0547
207148	28MDF_W3-079	0.0779
207204	28HOL_W1-112	0.0673
207206	28TIN_W1-124	0.2732
207400	28AA1-060 E	1.7523
901032	W1-024E OP1	0.2187
901112	W1-032 E OP1	0.1822
901912	W1-112E OP1	0.7862
901982	W1-119 E	0.6347
901992	W1-120E	0.6347
902032	W1-124E	3.2113
902082	W1-129E	0.3417
902322	W2-019 E	0.4046
902952	W2-082 E OP1	1.1683
903982	W3-079 E	0.9230
905252	W4-025 E	0.4849
907082	X1-037 E	2.2546
907272	X1-085 E	0.2758
912102	X4-015 E	0.3430
914092	Y2-051 E	0.6392
917612	Z2-102 E	0.9359
919662	AA2-048 E	1.4685
920732	AA2-184 E	3.5563
921743	AA2-049 E	0.9175
923292	AB1-138 C	0.5516
923293	AB1-138 E	0.9194
923463	AB1-163 E	0.7469

Bus #	Bus	MW Impact
925541	AC1-029 (Withdrawn : 11/27/2019)	12.5826
937261	AD2-165	25.1652
939121	AE1-142 C O1	1.2381
939122	AE1-142 E O1	1.7816
939981	AE1-238 C	69.5497
939982	AE1-238 E	182.6840
940161	AE2-000 C O1	32.0424
940162	AE2-000 E O1	81.9855
940401	AE2-024 C O1	30.5710
940402	AE2-024 E O1	143.1301
940411	AE2-025 C	15.4322
940412	AE2-025 E	72.2455
940691	AE2-056 C	0.3394
940692	AE2-056 E	0.2970
940701	AE2-057 C	0.0977
940702	AE2-057 E	0.0977
940921	AE2-081 C	0.3606
940922	AE2-081 E	0.3712
942201	AE2-232 C O1	15.7068
942202	AE2-232 E O1	40.1892
943521	AF1-023	2.5753
943561	AF1-027	0.1032
944332	AF1-101 E O1	42.6006
944611	AF1-126 C O1	2.7305
944612	AF1-126 E O1	10.9219
945571	AF1-222 C	51.0031
945572	AF1-222 E	134.4628
945951	AF1-260	0.2098
945981	AF1-263	0.1812
DUCKCREEK	DUCKCREEK	0.1773
NEWTON	NEWTON	0.1612
FARMERCITY	FARMERCITY	0.0082
NY	NY	1.3571
PRAIRIE	PRAIRIE	0.3720
O-066	O-066	30.7306
COFFEEN	COFFEEN	0.0793
EDWARDS	EDWARDS	0.0543
CHEOAH	CHEOAH	0.0576
TILTON	TILTON	0.0970
G-007	G-007	28.0353
MADISON	MADISON	0.0161
GIBSON	GIBSON	0.0824
CALDERWOOD	CALDERWOOD	0.0577
BLUEG	BLUEG	0.2621
TRIMBLE	TRIMBLE	0.0840
CATAWBA	CATAWBA	0.0304

Affected Systems

19 Affected Systems

19.1 LG&E

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

19.2 MISO

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

19.3 TVA

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

19.4 Duke Energy Progress

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

19.5 NYISO

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

20 Contingency Descriptions

Contingency Name	Contingency Definition
JC-P7-1-JCC-230-7A	CONTINGENCY 'JC-P7-1-JCC-230-7A' /* SMITHBURG - LARRABEE 230 LINES DISCONNECT BRANCH FROM BUS 206309 TO BUS 206294 CKT 1 DISCONNECT BRANCH FROM BUS 206309 TO BUS 206294 CKT 2 END
JC-P2-3-JCC-230-80	CONTINGENCY 'JC-P2-3-JCC-230-80' /* SOUTH RIVER JUNCTION G-T (RARITAN RIVER) LINES 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 BUS 206315 /* RED OAK 230 KV B TAP DISCONNECT BUS 206362 /* RED OAK 230 KV #1 DISCONNECT BUS 206365 /* RED OAK 230 KV #4 END
PS_P1-2_#1LINE	CONTINGENCY 'PS_P1-2_#1LINE' /* LAKE NELSON TO RARITIAN RIVER DISCONNECT BUS 218331 /* KILMER #1 CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER END
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-P1-2-JCC-230-031	CONTINGENCY 'JC-P1-2-JCC-230-031' /* VAN HISEVILLE TAP (B1042) 230 KV LINES DISCONNECT BRANCH FROM BUS 206318 TO BUS 206287 CKT 1 DISCONNECT BRANCH FROM BUS 206318 TO BUS 206720 CKT 1 DISCONNECT BRANCH FROM BUS 206720 TO BUS 206319 CKT 1 DISCONNECT BRANCH FROM BUS 206318 TO BUS 206294 CKT 1 DISCONNECT BUS 206318 DISCONNECT BUS 206720 END

Contingency Name	Contingency Definition
JC-P1-2-JCC-230-018	CONTINGENCY 'JC-P1-2-JCC-230-018' /* LARRABEE - SMITHBURG (H2008) 230 KV DISCONNECT BRANCH FROM BUS 206309 TO BUS 206294 CKT 2 DISCONNECT BRANCH FROM BUS 200017 TO BUS 206309 CKT 4 /* SMITHBURG SMITHBURG 500 230 END
JC-P1-2-JCC-230-043T	CONTINGENCY 'JC-P1-2-JCC-230-043T' /** RARITAN RIVER - LAKE NELSON (W1037) 230 KV LINE DISCONNECT BRANCH FROM BUS 206305 TO BUS 218332 CKT 1 /* 28RAR RVR - KILMER_W 230.00 LINE DISCONNECT BRANCH FROM BUS 218332 TO BUS 218334 CKT 1 /* KILMER_W - LNELSN_W 230.00 LINE DISCONNECT BRANCH FROM BUS 218386 TO BUS 218332 CKT 1 /* KILMER_L1 13.20 - KILMER_W 230.00 XFMR DISCONNECT BRANCH FROM BUS 218387 TO BUS 218332 CKT 1 /* KILMER_L3 13.20 - KILMER_W 230.00 XFMR END
JC-P1-2-JCC-230-017	CONTINGENCY 'JC-P1-2-JCC-230-017' /* FUTURE BREAKERS LARRABEE - SMITHBURG (D2004) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 END
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
PJM500_PS_P1-2_5022	CONTINGENCY 'PJM500_PS_P1-2_5022' /* DEANS TO WINDSOR TRIP LINE FROM BUS 200006 TO BUS 200028 CKT 1 /* DEANS TO WINDSOR END

Contingency Name	Contingency Definition
JC-P2-3-JCC-230-13A	CONTINGENCY 'JC-P2-3-JCC-230-13A' /* LARRABEE - SMITHBURG (D2004) & LAKEWOOD (Z2026) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 /* LARRABEE-SMITHBURG (D2004) DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 2 /* LARRABEE-LAKEWOOD (Z2026) SET BUS 206294 LOAD TO 0 MW /* LARRABEE BK8 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 12 /* LARRABEE BK12 END
JC-P2-3-JCC-230-47D	CONTINGENCY 'JC-P2-3-JCC-230-47D' /* ATLANTIC - OCEANVIEW (Y2025) & OCEANVIEW BK1 230 KV FUTURE OCEANVIEW RING BUS DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT Y /* ATLANTIC - OCEANVIEW (Y2025) DISCONNECT BRANCH FROM BUS 206300 TO BUS 206273 CKT 1 /* OCEANVIEW BK1 REDUCE BUS 206273 SHUNT BY 50 PERCENT /* OCEANVIEW CAPS ON 34.5 KV BUS A DISCONNECT BRANCH FROM BUS 206273 TO BUS 206929 CKT 2 /* OCEANVIEW - ALLENHURST (X102) 34.5KV END
JC-P2-3-JCC-230-47E	CONTINGENCY 'JC-P2-3-JCC-230-47E' /* OCEANVIEW BK2 230 KV FUTURE OCEANVIEW RING BUS & ATLANTIC - OCEANVIEW (Y2025) DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT Y /* ATLANTIC - OCEANVIEW (Y2025) DISCONNECT BRANCH FROM BUS 206300 TO BUS 206273 CKT 2 /* OCEANVIEW BK2 REDUCE BUS 206273 SHUNT BY 50 PERCENT /* OCEANVIEW CAPS ON 34.5 KV BUS B END
JC-P2-3-JCC-230-47B	CONTINGENCY 'JC-P2-3-JCC-230-47B' /* LARRABEE - OCEANVIEW (NEW) & ATLANTIC - OCEANVIEW (X2024) DISCONNECT BRANCH FROM BUS 206294 TO BUS 206300 CKT 1 /* LARRABEE - OCEANVIEW (NEW) DISCONNECT BRANCH FROM BUS 206294 TO BUS 206274 CKT 3 /* LARRABEE BK3 DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT X /* ATLANTIC - OCEANVIEW (X2024) END

Contingency Name	Contingency Definition
JC-P2-3-JCC-230-47C	CONTINGENCY 'JC-P2-3-JCC-230-47C' /* ATLANTIC - OCEANVIEW (X2024) & OCEANVIEW BK2 230 KV FUTURE OCEANVIEW RING BUS DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT X /* ATLANTIC - OCEANVIEW (X2024) DISCONNECT BRANCH FROM BUS 206300 TO BUS 206273 CKT 2 /* OCEANVIEW BK2 REDUCE BUS 206273 SHUNT BY 50 PERCENT /* OCEANVIEW CAPS ON 34.5 KV BUS B DISCONNECT BRANCH FROM BUS 206273 TO BUS 206929 CKT 1 /* OCEANVIEW - ALLENHURST (H216) 34.5KV END
JC-P2-3-JCC-230-15G	CONTINGENCY 'JC-P2-3-JCC-230-15G' /* LARRABEE-SMITHBURG (H2008) 230 KV & LARRABEE NW BUS 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 2 /* LARRABEE-SMITHBURG (H2008) REMOVE LOAD 7 FROM BUS 206294 /* LARRABEE BK7 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 9 /* LARRABEE BK9 END
JC-P2-3-JCC-230-15F	CONTINGENCY 'JC-P2-3-JCC-230-15F' /* LARRABEE - SMITHBURG (D2004) & LARRABEE NW BUS 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 1 /* LARRABEE-SMITHBURG (D2004) REMOVE LOAD 7 FROM BUS 206294 /* LARRABEE BK7 DISCONNECT BRANCH FROM BUS 206294 TO BUS 206275 CKT 9 /* LARRABEE BK9 END
JC-P2-3-JCC-230-15A	CONTINGENCY 'JC-P2-3-JCC-230-15A' /* LAKEWOOD-LARRABEE (K2011) & LARRABEE-SMITHBURG (H2008) 230 KV DISCONNECT BRANCH FROM BUS 206294 TO BUS 206323 CKT 1 /* LARRABEE - LAKEWOOD (K2011) DISCONNECT BRANCH FROM BUS 206294 TO BUS 206309 CKT 2 /* LARRABEE-SMITHBURG (H2008) END

Contingency Name	Contingency Definition
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-230-026C	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-P7-1-JCC-230-15	CONTINGENCY 'JC-P7-1-JCC-230-15' /* ATLANTIC - OCEANVIEW X2024 & Y2025 DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT X /* ATLANTIC-OCEANVIEW 230 DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT Y /* ATLANTIC-OCEANVIEW 230 END
PS_P7-1_1LINE+2LINE	CONTINGENCY 'PS_P7-1_1LINE+2LINE' /* LAKE NELSON - RARITIAN X2 DISCONNECT BUS 218331 /* REMOVE KILMER 1 DISCONNECT BUS 218332 /* REMOVE KILMER 2 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

Contingency Name	Contingency Definition
PJM500_PS_P2-3_DEAN5_5-6	CONTINGENCY 'PJM500_PS_P2-3_DEAN5_5-6' DISCONNECT BRANCH FROM BUS 200006 TO BUS 218306 CKT 2/* BRANCHBURG TX -2 TRIP LINE FROM BUS 200006 TO BUS 200028 CKT 1 /* DEANS TO WINSOR END
PS_P1-2_#2LINE	CONTINGENCY 'PS_P1-2_#2LINE' /* LAKE NELSON TO RARITIAN RIVER DISCONNECT BUS 218332 /* KILMER LINE #2 CLOSE LINE FROM BUS 218384 TO BUS 218387 CKT Z /* KILMER CLOSE LINE FROM BUS 218385 TO BUS 218386 CKT Z /* KILMER END
PS_P7-1_I1023+GBK-LN_LT	CONTINGENCY 'PS_P7-1_I1023+GBK-LN_LT' /* LAKE NELSON - GILLETE BRIDGEWATER & LAKE NELSON -GREENBROOK DISCONNECT BUS 218312 /* GREENBROOK I DISCONNECT BUS 218301 /* MIDDLESEX I DISCONNECT BUS 218333 /* LAKE NELSON I DISCONNECT BUS 218334 /* LAKE NELSON W DISCONNECT BUS 218522 /* MIDDLESEX W 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 SOMRVLLE 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 218384 /* INTERSTATION TIE TRANSFER LOAD FROM GREENBK TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218383 TO BUS 218395 /* INTERSTATION TIE TRANSFER LOAD FROM GREENBK TO SOUTH SECOND ST.(METUCHEN 26KV IM) END
JC-P1-2-JCC-230-027	CONTINGENCY 'JC-P1-2-JCC-230-027' /* RARITAN RIVER - RED OAK - R11 (G1047) 230 KV LINE DISCONNECT BRANCH FROM BUS 206305 TO BUS 206315 CKT 1 DISCONNECT BRANCH FROM BUS 206315 TO BUS 206410 CKT 1 DISCONNECT BUS 206315 DISCONNECT BUS 206362 DISCONNECT BUS 206365 END

Contingency Name	Contingency Definition
JC-P1-2-JCC-230-042T	CONTINGENCY 'JC-P1-2-JCC-230-042T' /** RARITAN RIVER - LAKE NELSON (I1023) 230 KV LINE DISCONNECT BRANCH FROM BUS 206305 TO BUS 218331 CKT 1 /* 28RAR RVR - KILMER_I 230.00 LINE DISCONNECT BRANCH FROM BUS 218331 TO BUS 218333 CKT 1 /* KILMER_I - LNELSN_I 230.00 LINE DISCONNECT BRANCH FROM BUS 218384 TO BUS 218331 CKT 1 /* KILMER_L2 13.20 - KILMER_I 230.00 XFMR DISCONNECT BRANCH FROM BUS 218385 TO BUS 218331 CKT 1 /* KILMER_L4 13.20 - KILMER_I 230.00 XFMR DISCONNECT BRANCH FROM BUS 218333 TO BUS 218427 CKT 1 /* L.NELSNI 230 L.NELSN3 69 END
Base Case	
JC-P1-2-JCC-230-003	CONTINGENCY 'JC-P1-2-JCC-230-003' /* FUTURE ATLANTIC - OCEANVIEW (X2024) 230 KV DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT X /* ATLANTIC 230.00 OCEANV 230.00 END
JC-P1-2-JCC-230-004	CONTINGENCY 'JC-P1-2-JCC-230-004' /* FUTURE ATLANTIC - OCEANVIEW (Y2025) 230 KV DISCONNECT BRANCH FROM BUS 206286 TO BUS 206300 CKT Y /* ATLANTIC 230.00 OCEANV 230.00 END
JC-P1-2-JCC-230-028	CONTINGENCY 'JC-P1-2-JCC-230-028' /* RARITAN RIVER - RED OAK - SOUTH RIVER JCT(T1034) 230 KV DISCONNECT BRANCH FROM BUS 206305 TO BUS 206314 CKT 1 /* 28RAR RVR 230.00 28RED OAKA 230.00 DISCONNECT BRANCH FROM BUS 206314 TO BUS 206411 CKT 1 /* 28RED OAKA 230.00 28R11RINGA 230.00 . DISCONNECT BUS 206314 /* 28RED OAKA 230.00 DISCONNECT BUS 206363 /* 28RDOAKCT2 18.00 DISCONNECT BUS 206364 /* 28RDOAKCT3 18.00 END

Contingency Name	Contingency Definition
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-P7-1-JCC-230-11A	CONTINGENCY 'JC-P7-1-JCC-230-11A' /* LAKEWOOD - LEISURE V 230 KV LINES DISCONNECT BRANCH FROM BUS 206323 TO BUS 206295 CKT 1 DISCONNECT BRANCH FROM BUS 206323 TO BUS 206296 CKT 1 DISCONNECT BRANCH FROM BUS 206323 TO BUS 206282 CKT 6 DISCONNECT BRANCH FROM BUS 206282 TO BUS 206999 CKT 1 SET BUS 206295 LOAD TO 0 MW DISCONNECT BUS 206999 DISCONNECT BUS 207110 DISCONNECT BUS 207010 DISCONNECT BUS 207111 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
PJM_P4_P484B	CONTINGENCY 'PJM_P4_P484B' /* VALID FROM 2009 DISCONNECT BRANCH FROM BUS 200028 TO BUS 200006 CKT 1 /* WINDSOR DEANS 500500 DISCONNECT BRANCH FROM BUS 200006 TO BUS 218306 CKT 1 /* DEANS XF 2 500230 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
PS_P1-2_I-1023	CONTINGENCY 'PS_P1-2_I-1023' /* TIE LINE GILLET I TO BRIDGEWATER THROUGH MIDDLESEX DISCONNECT BUS 218312 /* GREEN BROOK STATION DISCONNECT BUS 218301 /* MIDDLESEX I DISCONNECT BUS 218333 /* LAKE NELSON BUS I CLOSE LINE FROM BUS 218388 TO BUS 218389 CKT Z /* LAKE NELSON CLOSE LINE FROM BUS 218382 TO BUS 218383 CKT Z /* GREENBROOK 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

Short Circuit

21 Short Circuit

The following Breakers are overduty:

None

22 Attachment One: One Line Diagram