



Generation Interconnection

Feasibility Study Report

for

Queue Project AF1-237

MERCER 230 KV

80 MW Capacity / 200 MW Energy

January, 2020

1 Preface

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

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

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

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.

2 General

The Interconnection Customer (IC) has proposed a Storage generating facility located in Mercer County, New Jersey. The installed facilities will have a total capability of 200 MW with 80 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is May 30, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF1-237
Project Name	MERCER 230 KV
State	New Jersey
County	Mercer
Transmission Owner	PSEG
MFO	200
MWE	200
MWC	80
Fuel	Storage
Basecase Study Year	2023

2.1 Point of Interconnection

AF1-237 will interconnect with the PSEG transmission system at the Mercer 230 kV substation.

2.2 Cost Summary

The AF1-237 project will be responsible for the following costs for the physical interconnection:

Description	Total Cost
Attachment Facilities	\$2,100,000
Direct Connection Network Upgrade	\$0
Non Direct Connection Network Upgrades	\$0
Total Costs	\$2,100,000

In addition, the AF1-237 project may be responsible for a contribution to the following costs for Network Upgrades identified in this report:

Description	Total Cost
System Upgrades	\$54,329,400

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

3 Transmission Owner Scope of Work

3.1 Attachment Facilities

The total preliminary cost estimate for the Attachment work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
Install one (1) single circuit monopole and associated conductor to connect into an existing bus position, relays and revenue grade metering.	\$2,100,000
Total Attachment Facility Costs	\$2,100,000

3.2 Direct Connection Cost Estimate

None

3.3 Non-Direct Connection Cost Estimate

None

4 Schedule

The estimated schedule for completion of the Transmission Owner scope of work above is **24 months**.

5 Revenue Metering and SCADA Requirements

5.1 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.

5.2 PSEG Requirements

The Interconnection Customer will be required to comply with all PSE&G Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "Information and Requirements for Electric Service" document located at the following links:

http://www.pseg.com/business/builders/new_service/before/

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

6 Network Impacts

The Queue Project AF1-237 was evaluated as a 200.0 MW (Capacity 80.0 MW) injection at the Mercer 230 kV substation in the PSEG area. Project AF1-237 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-237 was studied with a commercial probability of 0.53. Potential network impacts were as follows:

Summer Peak Load Flow

7 Generation Deliverability

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

None

8 Multiple Facility Contingency

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

None

9 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
41041632	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	PS_P7-1_1LINE+2LINE	tower	813.0	139.88	144.72	DC	39.26
41041633	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	PS_P7-1_I1023+GBK-LN_LT	tower	813.0	136.99	141.83	DC	39.32
42250338	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	JC-P2-3-JCC-230-80	breaker	869.0	117.7	122.08	DC	37.98
42776767	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PS_P7-1_1LINE+2LINE	tower	869.0	131.06	135.47	DC	38.32
42776768	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PS_P7-1_I1023+GBK-LN_LT	tower	869.0	128.79	133.21	DC	38.37
46883454	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PJM500_PS_P2-3_DEAN5_5-6	breaker	869.0	113.67	117.97	DC	37.33
46883455	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PJM_P4_P484B	breaker	869.0	113.66	117.96	DC	37.33
46883557	218352	MDWRD_R	230.0	PSE&G	218304	BRUNSWCK	230.0	PSE&G	1	PS_P2-3_DEAN_9-10	breaker	885.0	109.36	112.92	DC	31.6
49872963	218352	MDWRD_R	230.0	PSE&G	218304	BRUNSWCK	230.0	PSE&G	1	PS_P7-1_D2204+S2219_LT	tower	885.0	119.0	122.3	DC	29.28
46883504	218357	PRSNV_R	230.0	PSE&G	218352	MDWRD_R	230.0	PSE&G	1	PS_P2-3_DEAN_9-10	breaker	885.0	112.46	116.02	DC	31.59
49872941	218357	PRSNV_R	230.0	PSE&G	218352	MDWRD_R	230.0	PSE&G	1	PS_P7-1_D2204+S2219_LT	tower	885.0	121.37	124.67	DC	29.28
49872921	218469	METUCHEN	230.0	PSE&G	218357	PRSNV_R	230.0	PSE&G	1	PS_P7-1_D2204+S2219_LT	tower	885.0	124.31	127.6	DC	29.28

10 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
41331657	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	JC-P1-2-JCC-230-042T	operation	813.0	113.7	118.57	DC	39.58
41331660	206316	28WINDSOR	230.0	JCP&L	219752	CLRKSVLL_1	230.0	PSE&G	1	Base Case	operation	678.0	113.41	119.25	DC	39.58
42557529	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	Base Case	operation	706.0	119.45	124.92	DC	38.58
49616907	206326	28E WINDSR	230.0	JCP&L	206316	28WINDSOR	230.0	JCP&L	1	PJM500_PS_P1-2_5022	operation	869.0	112.26	116.53	DC	37.02
49617234	218306	DEANS	230.0	PSE&G	218304	BRUNSWCK	230.0	PSE&G	1	PS_P1-2_Z-2331_LT	operation	887.0	97.27	101.91	DC	41.08
49616983	218357	PRSNVAV_R	230.0	PSE&G	218352	MDWRD_R	230.0	PSE&G	1	PS_P1-2_D-2204	operation	885.0	111.41	115.0	DC	31.87
42557764	219104	CLRKSVLL_2	230.0	PSE&G	217150	LAWRENCE	230.0	PSE&G	1	Base Case	operation	709.0	96.21	101.8	DC	39.58

11 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
49872941, 46883504	4	PRSSNAV_R 230.0 kV - MDWRD_R 230.0 kV Ckt 1	<p><u>PSEG</u> r_PS_AF1_FES_PierMead1075 (41) : Reconductor the Pierson Ave – Meadow Rd 230 kV line and upgrade terminal equipment to a minimum of 1075MVA SER Project Type : FAC Cost : \$3,400,000 Time Estimate : 24.0 Months</p> <p>r_PS_AF1_FES_PierMead1125 (42) : Reconductor and upgrade terminal equipment to a minimum of 1125MVA SER Project Type : FAC Cost : \$10,000,000 Time Estimate : 24.0 Months</p>	\$10,000,000
41041633, 41041632	1	28WINDSOR 230.0 kV - CLRKSULL_1 230.0 kV Ckt 1	<p>JCP&L-AF1-F-0018 : Replace substation conductor at Windsor. Upgrade terminal equipment at Windsor. Reconductor the Windsor – Clarksville 230 kV line (~7.5 miles) Project Type : FAC Cost : \$21,440,000 Time Estimate : 30.0 Months</p>	\$21,440,000
49872921	5	METUCHEN 230.0 kV - PRSSNAV_R 230.0 kV Ckt 1	<p><u>PSEG</u> r_PS_AF1_FES_MetPier1150 (40) : Reconductor the Metuchen – Pierson Ave 230 kV line Project Type : FAC Cost : \$14,300,000 Time Estimate : 24.0 Months</p>	\$14,300,000
49872963, 46883557	3	MDWRD_R 230.0 kV - BRUNSWCK 230.0 kV Ckt 1	<p><u>PSEG</u> r_PS_AF1_FES_MeadBrun1075 (43) : Facility upgrade is addressed by PS_AF1_FES_PierMead1075 upgrade Project Type : FAC Cost : \$0 Time Estimate : 24.0 Months</p> <p>r_PS_AF1_FES_MeadBrun1125 (44) : Facility upgrade addressed by PS_AF1_FES_PierMead1125 upgrade Project Type : FAC Cost : \$0 Time Estimate : 24.0 Months</p>	\$0
46883454, 46883455, 42250338, 42776767, 42776768	2	28E WINDSR 230.0 kV - 28WINDSOR 230.0 kV Ckt 1	<p><u>JCPL</u> JCP&L-AF1-F-0022a (174): Reconductor line (~2.53 miles). Upgrade terminal equipment at Windsor Project Type : FAC Cost : \$7,584,400 Time Estimate : 24.0 Months</p> <p>JCP&L-AF1-F-0022b (175) : Upgrade terminal equipment at Windsor Project Type : FAC Cost : \$1,005,000 Time Estimate : 12.0 Months</p>	\$8,589,400
TOTAL COST				\$54,329,400

12 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.

12.1 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
41041632	206316	28WINDSOR	JCP&L	219752	CLRKSVLL_1	PSE&G	1	PS_P7-1_1LINE+2LINE	tower	813.0	139.88	144.72	DC	39.26

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0525
206271	28MCRC/REC	1.1498
206325	28O C GEN (Deactivation : 09/17/18)	26.9289
206327	28S RIV G1	1.7583
206328	28S RIV G2	1.7583
206329	28S RIV G3	2.3421
206358	28PARLN1&2	1.1221
206359	28PARLN3&4	1.3539
206363	28RDOAKCT2	4.1536
206364	28RDOAKCT3	4.1536
206368	28MDLSEXCO	0.5003
206370	LKWD CT3	28.2506
206412	28R11	75.3368
206414	28X4-005E	2.8924
206416	28MLH_W1-032	0.0314
207143	28BYD_X4-031	0.3546
207144	28HOW_X1-037	0.1653
207145	28FRN_Y2-051	0.0455
207149	28UPF_X1-085	0.0456
207152	28NPK_W1-113	0.0998
207162	28APLW2-078	0.1117
207169	28W4-060COL	0.0946
207204	28HOL_W1-112	0.0376
207205	28MAN_W1-024	0.0435
207206	28TIN_W1-124	0.1581
207400	28AA1-060 E	2.2900
207419	AB2-139 E	0.0932
207420	AC1-207 C	1.0403
219679	NRGCENTER E	-0.3225
901032	W1-024E OP1	0.5131
901112	W1-032 E OP1	0.3806
901422	W1-113 E	1.1762
901912	W1-112E OP1	0.4390
901982	W1-119 E	0.5773
901992	W1-120E	0.5773
902032	W1-124E	1.8584
902082	W1-129E	0.3148
902322	W2-019 E	0.3735
902912	W2-078 E	1.3176
902952	W2-082 E OP1	1.0739
903982	W3-079 E	0.6362
905252	W4-025 E	0.4469

Bus #	Bus	MW Impact
905502	W4-060 E OP1	1.1056
907082	X1-037 E	1.9321
907272	X1-085 E	0.5329
912102	X4-015 E	0.3158
914092	Y2-051 E	0.5314
917612	Z2-102 E	0.8515
919662	AA2-048 E	1.0122
919712	AA2-058 E	-0.1729
919802	AA2-066 E	-0.3225
920732	AA2-184 E	2.0545
921743	AA2-049 E	0.5310
923292	AB1-138 C	0.4750
923293	AB1-138 E	0.7917
923463	AB1-163 E	0.6411
925541	AC1-029 (Withdrawn : 11/27/2019)	3.4244
927132	AC1-207 E	1.7409
934841	AD1-113	10.8464
937261	AD2-165	6.8488
937523	AD2-213 BAT	1.7866
939121	AE1-142 C O1	1.0708
939122	AE1-142 E O1	1.5409
939981	AE1-238 C	39.8183
939982	AE1-238 E	104.5893
940161	AE2-000 C O1	27.4680
940162	AE2-000 E O1	70.2811
940401	AE2-024 C O1	26.8517
940402	AE2-024 E O1	125.7167
940411	AE2-025 C	13.5547
940412	AE2-025 E	63.4560
940691	AE2-056 C	0.2937
940692	AE2-056 E	0.2570
940701	AE2-057 C	0.0941
940702	AE2-057 E	0.0941
940921	AE2-081 C	0.3120
940922	AE2-081 E	0.3212
940931	AE2-082 C	0.7227
940932	AE2-082 E	0.7653
942201	AE2-232 C O1	13.4645
942202	AE2-232 E O1	34.4517
943521	AF1-023	1.4877
943561	AF1-027	0.1349
944332	AF1-101 E O1	36.5189
944432	AF1-108 BAT	1.8492
944442	AF1-109 BAT	5.4658
944611	AF1-126 C O1	2.0815
944612	AF1-126 E O1	8.3261
945201	AF1-185 1	0.3312
945571	AF1-222 C	29.2001
945572	AF1-222 E	76.9820
945723	AF1-237 BAT	39.2580
945951	AF1-260	0.0766
945981	AF1-263	0.1241

Bus #	Bus	MW Impact
DUCKCREEK	DUCKCREEK	0.2545
NEWTON	NEWTON	0.2375
FARMERCITY	FARMERCITY	0.0124
G-007A	G-007A	40.7911
NY	NY	0.1604
PRAIRIE	PRAIRIE	0.5708
O-066	O-066	6.3773
COFFEEN	COFFEEN	0.1168
EDWARDS	EDWARDS	0.0774
CHEOAH	CHEOAH	0.1106
TILTON	TILTON	0.1392
GIBSON	GIBSON	0.1207
CALDERWOOD	CALDERWOOD	0.1098
BLUEG	BLUEG	0.3837
TRIMBLE	TRIMBLE	0.1230
CATAWBA	CATAWBA	0.0774

12.2 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
42776767	206326	28E WINDSR	JCP&L	206316	28WINDSOR	JCP&L	1	PS_P7-1_1LINE+2LINE	tower	869.0	131.06	135.47	DC	38.32

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 (Deactivation : 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

12.3 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
49872963	218352	MDWRD_R	PSE&G	218304	BRUNSWCK	PSE&G	1	PS_P7-1_D2204+S2219_LT	tower	885.0	119.0	122.3	DC	29.28

Bus #	Bus	MW Impact
217082	WEATEXAS E	0.1419
217104	FAIRLAWN_AB	8.8392
217203	FBANKSOLAR E	0.0842
217205	WCALDSOLAR E	0.1952
217207	PARK ELE E	0.0352
217210	CAMDEN ST E	0.0388
217212	AMBOY SO E	0.5495
217213	AMBOY SO C	0.0485
217214	CENTRL HS E	0.0497
217216	BARNGR HS E	0.0443
217218	BAYON2SP2_E	0.0074
217249	HACKENSOLA E	0.0818
217254	BAYON2SP4_E	0.0054
217255	BAYON2SP3_E	0.0092
217256	COOKPTSP1_E	0.0049
217270	COOKPTSP2_E	0.0052
217272	COOKPTSP3_E	0.0049
217274	COOKPTSP4_E (Deactivation : 06/01/15)	0.0041
217276	DOREMUSP1_E	0.0060
217280	DOREMUSP2_E	0.0063
217282	DOREMUSP3_E	0.0063
217284	DOREMUSP4_E	0.0060
217289	HOBK1SP1_E	0.0118
217291	HOBK1SP2_E	0.0118
217295	HOBK1SP3_E	0.0118
217297	HOBK1SP4_E	0.0118
217305	HILLDASP1_E	0.0020
217318	HILLDASP2_E	0.0020
217335	HILLDASP3_E	0.0020
217337	HILLDASP4_E	0.0020
217341	HOBK2SP1_E	0.0012
217343	HOBK2SP2_E	0.0012
217345	HOBK2SP3_E	0.0012
217350	HOBK2SP4_E	0.0012
217360	JACKPSSP1_E	0.0059
217364	JACKPSSP2_E	0.0059
217387	JACKPSSP3_E	0.0059
217389	JACKPSSP4_E	0.0059
217393	LEONIASP1_E	0.0150
217397	LEONIASP2_E	0.0150
217399	LEONIASP3_E	0.0150
217406	LEONIASP4_E	0.0150

Bus #	Bus	MW Impact
217410	MAYWOOSP1_E	0.0100
217418	MAYWOOSP2_E	0.0100
217420	MAYWOOSP3_E	0.0075
217425	MAYWOOSP4_E	0.0100
217449	NEWMILSP1_E	0.0078
217457	NEWMILSP2_E	0.0078
217460	NEWMILSP3_E	0.0078
217480	NEWMILSP4_E	0.0078
217487	SADDLESP1_E	0.0069
217489	SADDLESP2_E	0.0069
217517	SADDLESP3_E	0.0069
217519	SADDLESP4_E	0.0069
217530	WALDWKSP1_E	0.0019
217541	WALDWKSP2_E	0.0020
217543	WALDWKSP3_E	0.0004
217545	WALDWKSP4_E	0.0004
217547	WCALDWSP1_E	0.0029
217550	WCALDWSP2_E	0.0029
217560	WCALDWSP3_E	0.0029
217563	WCALDWSP4_E	0.0029
217565	ATHENISP1_E	0.0206
217567	ATHENISP2_E	0.0206
217569	ATHENISP3_E	0.0206
217572	MARIONSP1_E	0.0249
217576	MARIONSP2_E	0.0249
217583	MARIONSP3_E	0.0249
217585	WORNESP1_E	0.0117
217600	WORNESP2_E	0.0117
217610	WORNESP3_E	0.0117
217612	CEDARGSP1_E	0.0098
217614	CEDARGSP2_E	0.0098
217618	ERUTHSP1_E	0.0207
217630	ERUTHSP2_E	0.0207
217640	FAIRLASP1_E	0.0368
217642	FAIRLASP2_E	0.0368
217660	HINCHMSP1_E	0.0088
217670	HINCHMSP2_E	0.0088
217680	NORTHASP1_E	0.0300
217689	NORTHASP2_E	0.0300
217691	SPRINGSP1_E	0.0176
217710	SPRINGSP2_E	0.0176
217721	BELLEVSP1_E	0.0352
218344	TOSCO_G6	0.6092
218418	LINDEN_G5	2.0281
218419	LINDEN_G6	2.0281
218423	LINDEN_G21	5.2838
218424	LINDEN_G22	5.2838
218425	LINDEN_G12	5.7642
218426	LINDEN_2ST	9.1266
218428	ETC SOLAR C	0.0118
218429	ETC SOLAR E	0.1997
218439	SUMMTASSOC E	0.6595

Bus #	Bus	MW Impact
218440	SUMMTASSOC C	0.0564
218450	ALDENESP1_E	0.0230
218513	ALDENESP2_E	0.0231
218545	WOODBRS1_C	0.0086
218549	WOODBRS1_E	0.1004
218554	WOODBRS2_C	0.0072
218555	WOODBRS2_E	0.0836
218558	WOODBRS3_C	0.0072
218559	WOODBRS3_E	0.0838
218636	METUCHSP1_C	0.0127
218640	METUCHSP1_E	0.1483
218655	METUCHSP2_C	0.0127
218659	METUCHSP2_E	0.1483
218662	MINUESP1_C	0.0020
218663	MINUESP1_E	0.0241
218664	MINUESP2_C	0.0014
218665	MINUESP2_E	0.0165
218667	NWKSWTSP1_E	0.0420
218672	KENILWRTH E	1.1315
218675	WARINASP1_E	0.0481
218677	WARINASP2_E	0.0479
218727	LINSOLAR E	0.2512
218728	CNTRALGAS1 C	0.0874
218729	CNTRALGAS1 E	0.7563
218730	CNTRALGAS2 C	0.0873
218731	CNTRALGAS2 E	0.7551
219001	SEWAREN7GT	10.4693
219002	SEWAREN7ST	15.7040
219679	NRGCENTER E	-0.2931
219881	V2-009 E2	-0.6615
219883	V2-009 E1	-0.3301
913101	Y1-026	4.8660
917001	Z2-000 C O1	271.8758
917002	Z2-000 E O1	1.6207
917011	Z2-002 C	1.7292
917521	SEWARENG7E1	4.7891
917522	SEWARENG7E2	4.7891
919802	AA2-066 E	-0.2931
920031	AA2-099 C	1.6455
924431	AB2-092	7.0099
930092	AB1-021 E	0.1953
930901	AB1-139 C	0.1414
930902	AB1-139 E	1.6612
934302	AD1-054 E	0.1981
936193	AD2-025 BAT	0.3256
938281	AE1-041 C	0.0810
938282	AE1-041 E	0.3647
940301	AE2-014 FTIR (Withdrawn : 01/24/2020)	442.0680
943841	AF1-052 C	7.8807
943842	AF1-052 E	0.0276
945723	AF1-237 BAT	29.2780
945801	AF1-245 C O1	5.5375

Bus #	Bus	MW Impact
945802	AF1-245 E O1	8.3063
DUCKCREEK	DUCKCREEK	0.4813
NEWTON	NEWTON	0.4556
FARMERCITY	FARMERCITY	0.0240
G-007A	G-007A	0.3740
VFT	VFT	137.9913
PRAIRIE	PRAIRIE	1.1107
COFFEEN	COFFEEN	0.2236
EDWARDS	EDWARDS	0.1460
CHEOAH	CHEOAH	0.2342
TILTON	TILTON	0.2633
GIBSON	GIBSON	0.2304
CALDERWOOD	CALDERWOOD	0.2321
BLUEG	BLUEG	0.7326
TRIMBLE	TRIMBLE	0.2343
CATAWBA	CATAWBA	0.1767

12.4 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
49872941	218357	PRSENAV_R	PSE&G	218352	MDWRD_R	PSE&G	1	PS_P7-1_D2204+S2219_LT	tower	885.0	121.37	124.67	DC	29.28

Bus #	Bus	MW Impact
217082	WEATEXAS E	0.1419
217104	FAIRLAWN_AB	8.8403
217203	FBANKSOLAR E	0.0842
217205	WCALDSOLAR E	0.1952
217207	PARK ELE E	0.0352
217210	CAMDEN ST E	0.0389
217212	AMBOY SO E	0.5495
217213	AMBOY SO C	0.0485
217214	CENTRL HS E	0.0497
217216	BARNGR HS E	0.0443
217218	BAYON2SP2_E	0.0074
217249	HACKENSOLA E	0.0818
217254	BAYON2SP4_E	0.0054
217255	BAYON2SP3_E	0.0092
217256	COOKPTSP1_E	0.0049
217270	COOKPTSP2_E	0.0052
217272	COOKPTSP3_E	0.0049
217274	COOKPTSP4_E (Deactivation : 06/01/15)	0.0041
217276	DOREMUSP1_E	0.0060
217280	DOREMUSP2_E	0.0063
217282	DOREMUSP3_E	0.0063
217284	DOREMUSP4_E	0.0060
217289	HOBK1SP1_E	0.0118
217291	HOBK1SP2_E	0.0118
217295	HOBK1SP3_E	0.0118
217297	HOBK1SP4_E	0.0118
217305	HILLDASP1_E	0.0020
217318	HILLDASP2_E	0.0020
217335	HILLDASP3_E	0.0020
217337	HILLDASP4_E	0.0020
217341	HOBK2SP1_E	0.0012
217343	HOBK2SP2_E	0.0012
217345	HOBK2SP3_E	0.0012
217350	HOBK2SP4_E	0.0012
217360	JACKPSSP1_E	0.0059
217364	JACKPSSP2_E	0.0059
217387	JACKPSSP3_E	0.0059
217389	JACKPSSP4_E	0.0059
217393	LEONIASP1_E	0.0150
217397	LEONIASP2_E	0.0150
217399	LEONIASP3_E	0.0150
217406	LEONIASP4_E	0.0150

Bus #	Bus	MW Impact
217410	MAYWOOSP1_E	0.0100
217418	MAYWOOSP2_E	0.0100
217420	MAYWOOSP3_E	0.0075
217425	MAYWOOSP4_E	0.0100
217449	NEWMILSP1_E	0.0078
217457	NEWMILSP2_E	0.0078
217460	NEWMILSP3_E	0.0078
217480	NEWMILSP4_E	0.0078
217487	SADDLESP1_E	0.0069
217489	SADDLESP2_E	0.0069
217517	SADDLESP3_E	0.0069
217519	SADDLESP4_E	0.0069
217530	WALDWKSP1_E	0.0019
217541	WALDWKSP2_E	0.0020
217543	WALDWKSP3_E	0.0004
217545	WALDWKSP4_E	0.0004
217547	WCALDWSP1_E	0.0029
217550	WCALDWSP2_E	0.0029
217560	WCALDWSP3_E	0.0029
217563	WCALDWSP4_E	0.0029
217565	ATHENISP1_E	0.0206
217567	ATHENISP2_E	0.0206
217569	ATHENISP3_E	0.0206
217572	MARIONSP1_E	0.0249
217576	MARIONSP2_E	0.0249
217583	MARIONSP3_E	0.0249
217585	WORNESP1_E	0.0117
217600	WORNESP2_E	0.0117
217610	WORNESP3_E	0.0117
217612	CEDARGSP1_E	0.0098
217614	CEDARGSP2_E	0.0098
217618	ERUTHSP1_E	0.0207
217630	ERUTHSP2_E	0.0207
217640	FAIRLASP1_E	0.0368
217642	FAIRLASP2_E	0.0368
217660	HINCHMSP1_E	0.0088
217670	HINCHMSP2_E	0.0088
217680	NORTHASP1_E	0.0300
217689	NORTHASP2_E	0.0300
217691	SPRINGSP1_E	0.0176
217710	SPRINGSP2_E	0.0176
217721	BELLEVSP1_E	0.0352
218344	TOSCO_G6	0.6093
218418	LINDEN_G5	2.0283
218419	LINDEN_G6	2.0283
218423	LINDEN_G21	5.2843
218424	LINDEN_G22	5.2843
218425	LINDEN_G12	5.7647
218426	LINDEN_2ST	9.1274
218428	ETC SOLAR C	0.0118
218429	ETC SOLAR E	0.1997
218450	ALDENESP1_E	0.0230

Bus #	Bus	MW Impact
218513	ALDENESP2_E	0.0231
218545	WOODBRS1_C	0.0086
218549	WOODBRS1_E	0.1004
218554	WOODBRS2_C	0.0072
218555	WOODBRS2_E	0.0836
218558	WOODBRS3_C	0.0072
218559	WOODBRS3_E	0.0838
218636	METUCHSP1_C	0.0127
218640	METUCHSP1_E	0.1483
218655	METUCHSP2_C	0.0127
218659	METUCHSP2_E	0.1483
218662	MINUESP1_C	0.0020
218663	MINUESP1_E	0.0241
218664	MINUESP2_C	0.0014
218665	MINUESP2_E	0.0165
218667	NWKSWTSP1_E	0.0420
218672	KENILWRTH E	1.1317
218675	WARINASP1_E	0.0481
218677	WARINASP2_E	0.0479
218727	LINSOLAR E	0.2512
219001	SEWAREN7GT	10.4699
219002	SEWAREN7ST	15.7048
219679	NRGCENTER E	-0.2931
219881	V2-009 E2	-0.6615
219883	V2-009 E1	-0.3301
913101	Y1-026	4.8664
917001	Z2-000 C O1	271.8892
917002	Z2-000 E O1	1.6208
917011	Z2-002 C	1.7294
917521	SEWARENG7E1	4.7893
917522	SEWARENG7E2	4.7893
919712	AA2-058 E	-0.0698
919802	AA2-066 E	-0.2931
920031	AA2-099 C	1.6456
924431	AB2-092	7.0108
930092	AB1-021 E	0.1953
930901	AB1-139 C	0.1414
930902	AB1-139 E	1.6613
934302	AD1-054 E	0.1981
936193	AD2-025 BAT	0.3256
938281	AE1-041 C	0.0810
938282	AE1-041 E	0.3647
940301	AE2-014 FTIR (Withdrawn : 01/24/2020)	442.0920
943841	AF1-052 C	7.8817
943842	AF1-052 E	0.0276
945723	AF1-237 BAT	29.2760
945801	AF1-245 C O1	5.5383
945802	AF1-245 E O1	8.3074
DUCKCREEK	DUCKCREEK	0.4790
NEWTON	NEWTON	0.4534
FARMERCITY	FARMERCITY	0.0239
G-007A	G-007A	0.3788

Bus #	Bus	MW Impact
VFT	VFT	138.0042
PRAIRIE	PRAIRIE	1.1055
COFFEEN	COFFEEN	0.2225
EDWARDS	EDWARDS	0.1452
CHEOAH	CHEOAH	0.2332
TILTON	TILTON	0.2621
GIBSON	GIBSON	0.2293
CALDERWOOD	CALDERWOOD	0.2311
BLUEG	BLUEG	0.7291
TRIMBLE	TRIMBLE	0.2332
CATAWBA	CATAWBA	0.1761

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
49872921	218469	METUCHEN	PSE&G	218357	PRSNV_R	PSE&G	1	PS_P7-1_D2204+S2219_LT	tower	885.0	124.31	127.6	DC	29.28

Bus #	Bus	MW Impact
217082	WEATEXAS E	0.1419
217104	FAIRLAWN_AB	8.8403
217203	FBANKSOLAR E	0.0842
217205	WCALDSOLAR E	0.1952
217207	PARK ELE E	0.0352
217210	CAMDEN ST E	0.0389
217212	AMBOY SO E	0.5495
217213	AMBOY SO C	0.0485
217214	CENTRL HS E	0.0497
217216	BARNGR HS E	0.0443
217218	BAYON2SP2_E	0.0074
217249	HACKENSOLA E	0.0818
217254	BAYON2SP4_E	0.0054
217255	BAYON2SP3_E	0.0092
217256	COOKPTSP1_E	0.0049
217270	COOKPTSP2_E	0.0052
217272	COOKPTSP3_E	0.0049
217274	COOKPTSP4_E (Deactivation : 06/01/15)	0.0041
217276	DOREMUSP1_E	0.0060
217280	DOREMUSP2_E	0.0063
217282	DOREMUSP3_E	0.0063
217284	DOREMUSP4_E	0.0060
217289	HOBK1SP1_E	0.0118
217291	HOBK1SP2_E	0.0118
217295	HOBK1SP3_E	0.0118
217297	HOBK1SP4_E	0.0118
217305	HILLDASP1_E	0.0020
217318	HILLDASP2_E	0.0020
217335	HILLDASP3_E	0.0020
217337	HILLDASP4_E	0.0020
217341	HOBK2SP1_E	0.0012
217343	HOBK2SP2_E	0.0012
217345	HOBK2SP3_E	0.0012
217350	HOBK2SP4_E	0.0012
217360	JACKPSSP1_E	0.0059
217364	JACKPSSP2_E	0.0059
217387	JACKPSSP3_E	0.0059
217389	JACKPSSP4_E	0.0059
217393	LEONIASP1_E	0.0150
217397	LEONIASP2_E	0.0150
217399	LEONIASP3_E	0.0150
217406	LEONIASP4_E	0.0150

Bus #	Bus	MW Impact
217410	MAYWOOSP1_E	0.0100
217418	MAYWOOSP2_E	0.0100
217420	MAYWOOSP3_E	0.0075
217425	MAYWOOSP4_E	0.0100
217449	NEWMILSP1_E	0.0078
217457	NEWMILSP2_E	0.0078
217460	NEWMILSP3_E	0.0078
217480	NEWMILSP4_E	0.0078
217487	SADDLESP1_E	0.0069
217489	SADDLESP2_E	0.0069
217517	SADDLESP3_E	0.0069
217519	SADDLESP4_E	0.0069
217530	WALDWKSP1_E	0.0019
217541	WALDWKSP2_E	0.0020
217543	WALDWKSP3_E	0.0004
217545	WALDWKSP4_E	0.0004
217547	WCALDWSP1_E	0.0029
217550	WCALDWSP2_E	0.0029
217560	WCALDWSP3_E	0.0029
217563	WCALDWSP4_E	0.0029
217565	ATHENISP1_E	0.0206
217567	ATHENISP2_E	0.0206
217569	ATHENISP3_E	0.0206
217572	MARIONSP1_E	0.0249
217576	MARIONSP2_E	0.0249
217583	MARIONSP3_E	0.0249
217585	WORNGESP1_E	0.0117
217600	WORNGESP2_E	0.0117
217610	WORNGESP3_E	0.0117
217612	CEDARGSP1_E	0.0098
217614	CEDARGSP2_E	0.0098
217618	ERUTHSP1_E	0.0207
217630	ERUTHSP2_E	0.0207
217640	FAIRLASP1_E	0.0368
217642	FAIRLASP2_E	0.0368
217660	HINCHMSP1_E	0.0088
217670	HINCHMSP2_E	0.0088
217680	NORTHASP1_E	0.0300
217689	NORTHASP2_E	0.0300
217691	SPRINGSP1_E	0.0176
217710	SPRINGSP2_E	0.0176
217721	BELLEVSP1_E	0.0352
218344	TOSCO_G6	0.6093
218418	LINDEN_G5	2.0283
218419	LINDEN_G6	2.0283
218423	LINDEN_G21	5.2843
218424	LINDEN_G22	5.2843
218425	LINDEN_G12	5.7647
218426	LINDEN_2ST	9.1274
218450	ALDENESP1_E	0.0230
218513	ALDENESP2_E	0.0231
218545	WOODBRS1_C	0.0086

Bus #	Bus	MW Impact
218549	WOODBRS1_E	0.1004
218554	WOODBRS2_C	0.0072
218555	WOODBRS2_E	0.0836
218558	WOODBRS3_C	0.0072
218559	WOODBRS3_E	0.0838
218636	METUCHSP1_C	0.0127
218640	METUCHSP1_E	0.1483
218655	METUCHSP2_C	0.0127
218659	METUCHSP2_E	0.1483
218662	MINUESP1_C	0.0020
218663	MINUESP1_E	0.0241
218664	MINUESP2_C	0.0014
218665	MINUESP2_E	0.0165
218667	NWKSWTSP1_E	0.0420
218672	KENILWRTH E	1.1317
218675	WARINASP1_E	0.0481
218677	WARINASP2_E	0.0479
218727	LINSOLAR E	0.2512
219001	SEWAREN7GT	10.4699
219002	SEWAREN7ST	15.7048
219679	NRGCENTER E	-0.2931
219881	V2-009 E2	-0.6615
219883	V2-009 E1	-0.3301
913101	Y1-026	4.8664
917001	Z2-000 C O1	271.8892
917002	Z2-000 E O1	1.6208
917011	Z2-002 C	1.7294
917521	SEWARENG7E1	4.7893
917522	SEWARENG7E2	4.7893
919802	AA2-066 E	-0.2931
920031	AA2-099 C	1.6456
924431	AB2-092	7.0108
930092	AB1-021 E	0.1953
930901	AB1-139 C	0.1414
930902	AB1-139 E	1.6613
934302	AD1-054 E	0.1981
936193	AD2-025 BAT	0.3256
938281	AE1-041 C	0.0810
938282	AE1-041 E	0.3647
940301	AE2-014 FTIR (Withdrawn : 01/24/2020)	442.0920
943841	AF1-052 C	7.8817
943842	AF1-052 E	0.0276
945723	AF1-237 BAT	29.2760
945801	AF1-245 C O1	5.5383
945802	AF1-245 E O1	8.3074
DUCKCREEK	DUCKCREEK	0.4790
NEWTON	NEWTON	0.4534
FARMERCITY	FARMERCITY	0.0239
G-007A	G-007A	0.3788
VFT	VFT	138.0042
PRAIRIE	PRAIRIE	1.1055
COFFEEN	COFFEEN	0.2225

Bus #	Bus	MW Impact
EDWARDS	EDWARDS	0.1452
CHEOAH	CHEOAH	0.2332
TILTON	TILTON	0.2621
GIBSON	GIBSON	0.2293
CALDERWOOD	CALDERWOOD	0.2311
BLUEG	BLUEG	0.7291
TRIMBLE	TRIMBLE	0.2332
CATAWBA	CATAWBA	0.1761

12.6 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
42776847	219104	CLRKSVLL_2	PSE&G	217150	LAWRENCE	PSE&G	1	PS_P7-1_1LINE+2LINE	tower	869.0	120.87	125.4	DC	39.26

Bus #	Bus	MW Impact
206201	28JERSVGEN	0.0525
206271	28MCRC/REC	1.1498
206325	28O C GEN (Deactivation : 09/17/18)	26.9289
206327	28S RIV G1	1.7583
206328	28S RIV G2	1.7583
206329	28S RIV G3	2.3421
206358	28PARLN1&2	1.1221
206359	28PARLN3&4	1.3539
206363	28RDOAKCT2	4.1536
206364	28RDOAKCT3	4.1536
206368	28MDLSEXCO	0.5003
206370	LKWD CT3	28.2506
206412	28R11	75.3368
206414	28X4-005E	2.8924
206416	28MLH_W1-032	0.0314
207143	28BYD_X4-031	0.3546
207144	28HOW_X1-037	0.1653
207145	28FRN_Y2-051	0.0455
207149	28UPF_X1-085	0.0456
207152	28NPK_W1-113	0.0998
207162	28APLW2-078	0.1117
207169	28W4-060COL	0.0946
207204	28HOL_W1-112	0.0376
207205	28MAN_W1-024	0.0435
207206	28TIN_W1-124	0.1581
207400	28AA1-060 E	2.2900
207419	AB2-139 E	0.0932
207420	AC1-207 C	1.0403
219278	CLARKSP1_C	0.0013
219281	CLARKSP1_E	0.0147
219283	CLARKSP2_C	0.0010
219302	CLARKSP2_E	0.0121
219327	CLARKSP3_C	0.0003
219329	CLARKSP3_E	0.0030
219330	CLARKSP4_C	0.0005
219335	CLARKSP4_E	0.0060
219679	NRGCENTER E	-0.3225
901032	W1-024E OP1	0.5131
901112	W1-032 E OP1	0.3806
901422	W1-113 E	1.1762
901912	W1-112E OP1	0.4390
901982	W1-119 E	0.5773

Bus #	Bus	MW Impact
901992	W1-120E	0.5773
902032	W1-124E	1.8584
902082	W1-129E	0.3148
902322	W2-019 E	0.3735
902912	W2-078 E	1.3176
902952	W2-082 E OP1	1.0739
903982	W3-079 E	0.6362
905252	W4-025 E	0.4469
905502	W4-060 E OP1	1.1056
907082	X1-037 E	1.9321
907272	X1-085 E	0.5329
912102	X4-015 E	0.3158
914092	Y2-051 E	0.5314
917612	Z2-102 E	0.8515
919662	AA2-048 E	1.0122
919712	AA2-058 E	-0.1729
919802	AA2-066 E	-0.3225
920732	AA2-184 E	2.0545
921743	AA2-049 E	0.5310
923292	AB1-138 C	0.4750
923293	AB1-138 E	0.7917
923463	AB1-163 E	0.6411
925541	AC1-029 (Withdrawn : 11/27/2019)	3.4244
927132	AC1-207 E	1.7409
934841	AD1-113	10.8464
937261	AD2-165	6.8488
937523	AD2-213 BAT	1.7866
939121	AE1-142 C O1	1.0708
939122	AE1-142 E O1	1.5409
939981	AE1-238 C	39.8183
939982	AE1-238 E	104.5893
940161	AE2-000 C O1	27.4680
940162	AE2-000 E O1	70.2811
940401	AE2-024 C O1	26.8517
940402	AE2-024 E O1	125.7167
940411	AE2-025 C	13.5547
940412	AE2-025 E	63.4560
940691	AE2-056 C	0.2937
940692	AE2-056 E	0.2570
940701	AE2-057 C	0.0941
940702	AE2-057 E	0.0941
940921	AE2-081 C	0.3120
940922	AE2-081 E	0.3212
940931	AE2-082 C	0.7227
940932	AE2-082 E	0.7653
942201	AE2-232 C O1	13.4645
942202	AE2-232 E O1	34.4517
943521	AF1-023	1.4877
943561	AF1-027	0.1349
944332	AF1-101 E O1	36.5189
944432	AF1-108 BAT	1.8492
944442	AF1-109 BAT	5.4658

Bus #	Bus	MW Impact
944611	AF1-126 C O1	2.0815
944612	AF1-126 E O1	8.3261
945201	AF1-185 1	0.3312
945571	AF1-222 C	29.2001
945572	AF1-222 E	76.9820
945723	AF1-237 BAT	39.2580
945951	AF1-260	0.0766
945981	AF1-263	0.1241
DUCKCREEK	DUCKCREEK	0.2545
NEWTON	NEWTON	0.2375
FARMERCITY	FARMERCITY	0.0124
G-007A	G-007A	40.7911
NY	NY	0.1604
PRAIRIE	PRAIRIE	0.5708
O-066	O-066	6.3773
COFFEEN	COFFEEN	0.1168
EDWARDS	EDWARDS	0.0774
CHEOAH	CHEOAH	0.1106
TILTON	TILTON	0.1392
GIBSON	GIBSON	0.1207
CALDERWOOD	CALDERWOOD	0.1098
BLUEG	BLUEG	0.3837
TRIMBLE	TRIMBLE	0.1230
CATAWBA	CATAWBA	0.0774

Affected Systems

13 Affected Systems

13.1 LG&E

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

13.2 MISO

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

13.3 TVA

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

13.4 Duke Energy Progress

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

13.5 NYISO

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

Contingency Name	Contingency Definition
PS_P2-3_DEAN_9-10	CONTINGENCY 'PS_P2-3_DEAN_9-10' TRIP LINE FROM BUS 218304 TO BUS 218306 CKT 1 /* DEANS TO BRUNSWICK DISCONNECT BRANCH FROM BUS 200006 TO BUS 218306 CKT 3 END
PS_P7-1_D2204+S2219_LT	CONTINGENCY 'PS_P7-1_D2204+S2219_LT' /* DEANS - BRUNSWICK & DEANS - METUCHEN TRIP LINE FROM BUS 218304 TO BUS 218306 CKT 1 DISCONNECT BUS 218358 /* PIERSON AVE S CLOSE LINE FROM BUS 218401 TO BUS 218402 CKT Z/* PIERSON AVE DISCONNECT BUS 218351 /* MDWRD_S CLOSE LINE FROM BUS 218392 TO BUS 218393 CKT Z/* MDWRD_L1_L2 MOVE 8 MW LOAD FROM BUS 218401 TO BUS 218384 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218393 TO BUS 218385 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO KILMER T4 MOVE 8 MW LOAD FROM BUS 218401 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218402 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218402 TO BUS 218390 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO LAFAYET T2 MOVE 8 MW LOAD FROM BUS 218392 TO BUS 219616 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO HARTS LANE MOVE 8 MW LOAD FROM BUS 218392 TO BUS 219616 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO HARTS LANE MOVE 8 MW LOAD FROM BUS 218393 TO BUS 218390 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO LAFAYET T2 END
PS_P1-2_D-2204	CONTINGENCY 'PS_P1-2_D-2204' /* BRUNSWICK DEANS TRIP LINE FROM BUS 218304 TO BUS 218306 CKT 1 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_P7-1_1LINE+2LINE	CONTINGENCY 'PS_P7-1_1LINE+2LINE' /* LAKE NELSON - RARITAN 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/* BRANCBURG TX -2 TRIP LINE FROM BUS 200006 TO BUS 200028 CKT 1 /* DEANS TO WINSOR 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 SOMRVILLE 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-230-042T	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.NELSN1 230 L.NELSN3 69 END
Base Case	
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
PS_P1-2_Z-2331_LT	CONTINGENCY 'PS_P1-2_Z-2331_LT' /* METUCHEN_BRUNSWICK DISCONNECT BUS 218352 /* MEDOWS ROAD R CLOSE LINE FROM BUS 218393 TO BUS 218392 CKT Z /* MEADOW ROAD DISCONNECT BUS 218357 /* PIERSON AVE R CLOSE LINE FROM BUS 218401 TO BUS 218402 CKT Z/* PIERSON AVE MOVE 8 MW LOAD FROM BUS 218401 TO BUS 218384 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO KILMER T2 MOVE 8 MW LOAD FROM BUS 218393 TO BUS 218385 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO KILMER T4 MOVE 8 MW LOAD FROM BUS 218401 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218402 TO BUS 218399 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO NEWDOVR T2 MOVE 8 MW LOAD FROM BUS 218402 TO BUS 218390 /* INTERSTATION TIE TRANSFER LOAD FROM PRSNAVS TO LAFAYET T2 MOVE 8 MW LOAD FROM BUS 218392 TO BUS 219616 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO HARTS LANE MOVE 8 MW LOAD FROM BUS 218392 TO BUS 219616 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO HARTS LANE MOVE 8 MW LOAD FROM BUS 218393 TO BUS 218390 /* INTERSTATION TIE TRANSFER LOAD FROM MDWRD TO LAFAYET T2 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

Short Circuit

14 Short Circuit

The following Breakers are over duty

None