

PJM Feasibility Study Report

Long-Term Firm Transmission Service

OASIS Assignment Reference 4966877

Queue Project AE1-097

January 31, 2019

Network Impacts

The Queue Project AE1-097 was evaluated as a 62 MW injection from PJM to the HTP Converter Station (O66). Project AE1-097 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-097 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Analysis - 2022

Generator Deliverability

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

No Issues Identified.

Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
667484	200678	26LENOX	PENELEC	203342	26WILLPOTTER	PENELEC	1	PL:03:P71:001017	tower	162	99.01	101.56	AC	4.13

Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
422573	200675	26E.TWANDA	PENELEC	130763	HILSD230	NYISO	1	PN-P2-3-PN-115-19H	breaker	531	144.47	145.22	AC	4.00
422714	200675	26E.TWANDA	PENELEC	200674	26TOWANDA	PENELEC	4	PN-P2-3-PN-115-19E	breaker	226	105.87	106.29	AC	0.94
546657	200675	26E.TWANDA	PENELEC	130763	HILSD230	NYISO	1	PN-P2-2-PN-115-069	single	531	143.58	144.33	AC	4.00
546660	200675	26E.TWANDA	PENELEC	130763	HILSD230	NYISO	1	PN-P2-2-PN-115-068T	single	531	140.95	141.70	AC	4.00
546664	200675	26E.TWANDA	PENELEC	130763	HILSD230	NYISO	1	Base Case	single	483	132.24	132.95	AC	3.43
667222	200675	26E.TWANDA	PENELEC	130763	HILSD230	NYISO	1	PL:03:P71:001017	tower	531	152.38	153.01	AC	3.32
546602	200676	26E.SAYRE	PENELEC	130836	N.WAV115	NYISO	1	PN-P2-2-PN-115-070	single	128	153.57	154.59	AC	1.30
546603	200676	26E.SAYRE	PENELEC	130836	N.WAV115	NYISO	1	PN-P2-2-PN-115-072	single	128	153.07	154.10	AC	1.32
546606	200676	26E.SAYRE	PENELEC	130836	N.WAV115	NYISO	1	Base Case	single	108	136.96	138.05	AC	1.18
422657	200677	26NO MESHO	PENELEC	200678	26LENOX	PENELEC	1	PN-P2-3-PN-115-46G	breaker	189	107.55	108.41	AC	1.63
547005	200677	26NO MESHO	PENELEC	200678	26LENOX	PENELEC	1	Base Case	single	136	101.95	102.77	AC	1.12
422625	200678	26LENOX	PENELEC	203342	26WILLPOTTER	PENELEC	1	PN-P2-3-PN-115-46G	breaker	162	116.06	117.02	AC	1.55
422683	200936	26WILLMS	PENELEC	200679	26TIFFANY	PENELEC	1	PN-P2-3-PN-115-46G	breaker	162	101.34	102.30	AC	1.55
422647	203342	26WILLPOTTER	PENELEC	200936	26WILLMS	PENELEC	1	PN-P2-3-PN-115-46G	breaker	162	108.91	109.87	AC	1.55

Contingency Definitions

Contingency Name	Contingency Definition
PN-P2-2-PN-115-072	CONTINGENCY 'PN-P2-2-PN-115-072' /* LENOX 115KV BUS FAULT DISCONNECT BUS 200678 /* 26LENOX 115 END
PN-P2-3-PN-115-19E	CONTINGENCY 'PN-P2-3-PN-115-19E' /* EAST TOWANDA STUCK 115KV BKR (NORTH MESHOPPEN/#3 XFMR) OPEN BRANCH FROM BUS 200674 TO BUS 200677 CKT 1 /* EAST TOWANDA - NORTH MESHOPPEN 115KV LINE OPEN BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 /* EAST TOWANDA #3 230/115KV XFMR END
PL:03:P71:001017	CONTINGENCY 'PL:03:P71:001017' /* LACK-HOPA 500KV & PAUP-BLGR 230KV DISCONNECT BRANCH FROM BUS 200074 TO BUS 200098 CKT 1 /* LACKAW-LACHOP_T 500 DISCONNECT BRANCH FROM BUS 200091 TO BUS 200098 CKT 1 /* HOPAKONG-LACHOP_T 500 DISCONNECT BRANCH FROM BUS 208049 TO BUS 207919 CKT 1 /* PAUP-BLGR TR2 230 DISCONNECT BRANCH FROM BUS 207919 TO BUS 211394 CKT 2 /* BLGR-BLGR 230/69KV T2 END
PN-P2-3-PN-115-19H	CONTINGENCY 'PN-P2-3-PN-115-19H' /* EAST TOWANDA STUCK 115KV BKR (BUS 2/EAST SAYRE) OPEN BRANCH FROM BUS 200674 TO BUS 200676 CKT 1 /* EAST TOWANDA - EAST SAYRE 115KV LINE OPEN BRANCH FROM BUS 200674 TO BUS 200689 CKT 5 /* EAST TOWANDA #5 115/34.5KV XFMR REDUCE BUS 200674 SHUNT BY 100 PERCENT /* EAST TOWANDA 115KV CAP END
PN-P2-2-PN-115-068T	CONTINGENCY 'PN-P2-2-PN-115-068T' /* EAST SAYRE #1 115KV BUS FAULT DISCONNECT BRANCH FROM BUS 200676 TO BUS 130836 CKT 1 /* 26E.SAYRE 115 N.WAV115 115 DISCONNECT BRANCH FROM BUS 200676 TO BUS 200688 CKT 3 /* 26E.SAYRE 115 26E SAYRE1 35 END
PN-P2-3-PN-115-46G	CONTINGENCY 'PN-P2-3-PN-115-46G' /* 672 DISCONNECT BRANCH FROM BUS 200677 TO BUS 200698 CKT 2 /* 26NO MESHO 115 26MEHOOPNY 115 DISCONNECT BRANCH FROM BUS 200674 TO BUS 200677 CKT 1 /* 26TOWANDA 115 26NO MESHO 115 DISCONNECT BRANCH FROM BUS 200677 TO BUS 200687 CKT 2 /* 26NO MESHO 115 26N MESH2 35 DISCONNECT BRANCH FROM BUS 200675 TO BUS 200924 CKT 1 /* 26E.TWANDA 230 26CANYON 230 DISCONNECT BRANCH FROM BUS 200706 TO BUS 200924 CKT 1 /* 26N.MESHPN 230 26CANYON 230 DISCONNECT BRANCH FROM BUS 200677 TO BUS 200706 CKT 4 /* 26NO MESHO 115 26N.MESHPN 230 END
PN-P2-2-PN-115-070	CONTINGENCY 'PN-P2-2-PN-115-070' /* NORTH MESHOPPEN #1 115KV BUS FAULT DISCONNECT BRANCH FROM BUS 200677 TO BUS 200678 CKT 1 /* 26NO MESHO 115 26LENOX 115 DISCONNECT BRANCH FROM BUS 200677 TO BUS 200699 CKT 1 /* 26NO MESHO 115 26MEHOP 3 115 DISCONNECT BRANCH FROM BUS 200677 TO BUS 200706 CKT 3 /* 26NO MESHO 115 26N.MESHPN 230 DISCONNECT BRANCH FROM BUS 200677 TO BUS 200684 CKT 1 /* 26NO MESHO 115 26N MESH 35 REDUCE BUS 200677 SHUNT BY 100 PERCENT /* 26NO MESHO 115 END
PN-P2-2-PN-115-069	CONTINGENCY 'PN-P2-2-PN-115-069' /* EAST SAYRE #2 115KV BUS FAULT DISCONNECT BRANCH FROM BUS 200676 TO BUS 200674 CKT 1 /* 26E.SAYRE 115 26TOWANDA 115 DISCONNECT BRANCH FROM BUS 200676 TO BUS 200882 CKT 1 /* 26E.SAYRE 115 26E SAYRE2 35 END

System Reinforcements

ID	Appendix	Facility	Upgrade Description	Cost
546602,546603, 546606	8	26E.SAYRE 115.0 kV - N.WAV115 115.0 kV Ckt 1	<u>PENELEC</u> Description : No Violation. This line can be opened pre-contingency as per the operating procedure in PJM manual 03. Alternatively, the line overcurrent relaying will trip this line is the flow exceeds 128 MVA. <u>NYISO</u> Description : The external (i.e. Non-PJM) Transmission Owner, NYISO, will not evaluate this violation until the impact study phase.	\$0
422683	9	26WILLMS 115.0 kV - 26TIFFANY 115.0 kV Ckt 1	Description : Supplemental upgrade s1729: Expand the existing North Meshoppen 115 kV yard to a breaker-and-a-half configuration. The supplemental project has an projected in-service date of 12/31/2020.	\$0
422625,667484	2	26LENOX 115.0 kV - 26WILLPOTTER 115.0 kV Ckt 1	Description : Reconductor the Lenox to Williams Potter 115 kV line. Time Estimate : 24.0 Months Cost : \$10,287,900	\$10,287,900
422657,547005	3	26NO MESHO 115.0 kV - 26LENOX 115.0 kV Ckt 1	Description : Upgrade terminal equipment at Lenox and North Meshoppen substations. Time Estimate : 18.0 Months Cost : \$579,900	\$579,900
422647	5	26WILLPOTTER 115.0 kV - 26WILLMS 115.0 kV Ckt 1	Description : Reconductor the Williams to Williams Potter 115 kV line. Time Estimate : 24.0 Months Cost : \$3,031,700	\$3,031,700
422714	7	26E.TWANDA 230.0 kV - 26TOWANDA 230.0 kV Ckt 4	Description : Replace transformer with a larger unit and upgrade associated terminal equipment. Time Estimate : 12.0 Months Cost : \$4,975,700	\$4,975,700
546664,546657,5466 60,422573,667222	6	26E.TWANDA 230.0 kV - HILSD230 230.0 kV Ckt 1	<u>PENELEC</u> Description : Reconductor line and upgrade terminal equipment at East Towanda. Time Estimate : 24.0 Months Cost : \$62,917,900 <u>NYISO</u> Description : The external (i.e. Non-PJM) Transmission Owner, NYISO, will not evaluate this violation until the impact study phase.	\$62,917,900
		TOTAL COST		\$81,793,100

Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gauge 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.

Appendix 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
422625	200678	26LENOX	PENELEC	203342	26WILLPOTTER	PENELEC	1	PN-P2-3-PN-115-46G	breaker	162.0	116.06	131.28	AC	24.84

Bus #	Bus	MW Impact
200823	26MHP_X3-003	9.86
200851	26MEHOOP3	1.5
200917	26MTNTP_P28	0.76
294573	P-028 E	19.94
916051	Z1-038	2.4
916351	Z1-091	3.2
AA2-200	AA2-200	24.32
AE1-097	AE1-097	24.84
BAYOU	BAYOU	0.43
BIG_CAJUN1	BIG_CAJUN1	0.66
BIG_CAJUN2	BIG_CAJUN2	1.32
BLUEG	BLUEG	2.28
CALDERWOOD	CALDERWOOD	0.21
CANNELTON	CANNELTON	0.14
CARR	CARR	0.81
CATAWBA	CATAWBA	0.12

Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.19
CHILHOWEE	CHILHOWEE	0.07
CHOCTAW	CHOCTAW	0.43
COFFEEN	COFFEEN	0.24
COTTONWOOD	COTTONWOOD	1.71
DEARBORN	DEARBORN	0.49
DUCKCREEK	DUCKCREEK	0.53
EDWARDS	EDWARDS	0.25
ELMERSMITH	ELMERSMITH	0.23
FARMERCITY	FARMERCITY	0.16
G-007A	G-007A	2.7
GIBSON	GIBSON	0.09
HAMLET	HAMLET	0.35
NEWTON	NEWTON	0.63
O-066A	O-066A	1.36
PRAIRIE	PRAIRIE	1.15
RENSSELAER	RENSSELAER	0.67
SANTEETLA	SANTEETLA	0.06
SMITHLAND	SMITHLAND	0.09
TATANKA	TATANKA	0.29
TILTON	TILTON	0.29
TRIMBLE	TRIMBLE	0.25
TVA	TVA	0.71

Bus #	Bus	MW Impact
UNIONPOWER	UNIONPOWER	0.31
VFT	VFT	7.65

Appendix 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
422657	200677	26NO MESHO	PENELEC	200678	26LENOX	PENELEC	1	PN-P2-3-PN-115-46G	breaker	189.0	107.55	121.27	AC	26.13

Bus #	Bus	MW Impact
200823	26MHP_X3-003	10.37
200851	26MEHOOP3	1.58
200917	26MTNTP_P28	0.8
294573	P-028 E	20.98
916051	Z1-038	2.52
AA2-200	AA2-200	25.58
AE1-097	AE1-097	26.13
BAYOU	BAYOU	0.45
BIG_CAJUN1	BIG_CAJUN1	0.69
BIG_CAJUN2	BIG_CAJUN2	1.39
BLUEG	BLUEG	2.39
CALDERWOOD	CALDERWOOD	0.22
CANNELTON	CANNELTON	0.14
CARR	CARR	0.85
CATAWBA	CATAWBA	0.12

Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.2
CHILHOWEE	CHILHOWEE	0.07
CHOCTAW	CHOCTAW	0.46
COFFEEN	COFFEEN	0.25
COTTONWOOD	COTTONWOOD	1.8
DEARBORN	DEARBORN	0.52
DUCKCREEK	DUCKCREEK	0.56
EDWARDS	EDWARDS	0.26
ELMERSMITH	ELMERSMITH	0.25
FARMERCITY	FARMERCITY	0.16
G-007A	G-007A	2.84
GIBSON	GIBSON	0.1
HAMLET	HAMLET	0.37
NEWTON	NEWTON	0.66
O-066A	O-066A	1.43
PRAIRIE	PRAIRIE	1.2
RENSSELAER	RENSSELAER	0.71
SANTEETLA	SANTEETLA	0.06
SMITHLAND	SMITHLAND	0.09
TATANKA	TATANKA	0.3
TILTON	TILTON	0.31
TRIMBLE	TRIMBLE	0.27
TVA	TVA	0.74

Bus #	Bus	MW Impact
UNIONPOWER	UNIONPOWER	0.33
VFT	VFT	8.06

Appendix 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
422647	203342	26WILLPOTTER	PENELEC	200936	26WILLMS	PENELEC	1	PN-P2-3-PN-115-46G	breaker	162.0	108.91	124.12	AC	24.84

Bus #	Bus	MW Impact
200823	26MHP_X3-003	9.86
200851	26MEHOOP3	1.5
200917	26MTNTP_P28	0.76
294573	P-028 E	19.94
916051	Z1-038	2.4
916351	Z1-091	3.2
AA2-200	AA2-200	24.32
AE1-097	AE1-097	24.84
BAYOU	BAYOU	0.43
BIG_CAJUN1	BIG_CAJUN1	0.66
BIG_CAJUN2	BIG_CAJUN2	1.32
BLUEG	BLUEG	2.28
CALDERWOOD	CALDERWOOD	0.21
CANNELTON	CANNELTON	0.14
CARR	CARR	0.81
CATAWBA	CATAWBA	0.12

Bus #	Bus	MW Impact
CHEOAH	CHEOAH	0.19
CHILHOWEE	CHILHOWEE	0.07
CHOCTAW	CHOCTAW	0.43
COFFEEN	COFFEEN	0.24
COTTONWOOD	COTTONWOOD	1.71
DEARBORN	DEARBORN	0.49
DUCKCREEK	DUCKCREEK	0.53
EDWARDS	EDWARDS	0.25
ELMERSMITH	ELMERSMITH	0.23
FARMERCITY	FARMERCITY	0.16
G-007A	G-007A	2.7
GIBSON	GIBSON	0.09
HAMLET	HAMLET	0.35
NEWTON	NEWTON	0.63
O-066A	O-066A	1.36
PRAIRIE	PRAIRIE	1.15
RENSSELAER	RENSSELAER	0.67
SANTEETLA	SANTEETLA	0.06
SMITHLAND	SMITHLAND	0.09
TATANKA	TATANKA	0.29
TILTON	TILTON	0.29
TRIMBLE	TRIMBLE	0.25
TVA	TVA	0.71

Bus #	Bus	MW Impact
UNIONPOWER	UNIONPOWER	0.31
VFT	VFT	7.65

Appendix 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
667222	200675	26E.TWANDA	PENELEC	130763	HILSD230	NYISO	1	PL:03:P71:001017	tower	531.0	152.38	162.26	AC	53.15

Bus #	Bus	MW Impact
200823	26MHP_X3-003	7.64
200894	26K02	9.26
200949	26X1-109	29.14
203283	26MANOR_T86	0.03
210706	HOLD	1.27
294573	P-028 E	15.47
916051	Z1-038	2.62
916541	Z1-110	0.4
917072	Z2-011	0.4
917661	WAYM E	3.56
918602	AA1-077 E	5.06
918682	AA1-082 E	14.28
918871	AA1-106	2.6
919201	AA1-144 O1	39.48
919491	AA2-000	40.08
920351	AA2-133	0.44

Bus #	Bus	MW Impact
925951	AC1-071 C	0.55
925952	AC1-071 E	3.71
930511	AB1-092	1.47
930641	AB1-108	25.37
934801	AD1-108	0.03
934811	AD1-109	0.02
936421	AD2-055	3.03
938331	AE1-051	0.64
938401	AE1-059 C O1	14.2
938402	AE1-059 E O1	14.2
AA2-200	AA2-200	47.57
AA2-300	AA2-300	7.92
AA2-400	AA2-400	11.33
AE1-097	AE1-097	53.15
BAYOU	BAYOU	0.84
BIG_CAJUN1	BIG_CAJUN1	1.28
BIG_CAJUN2	BIG_CAJUN2	2.58
BLUEG	BLUEG	4.38
CALDERWOOD	CALDERWOOD	0.41
CANNELTON	CANNELTON	0.26
CARR	CARR	2.27
CATAWBA	CATAWBA	0.23
CHEOAH	CHEOAH	0.38

Bus #	Bus	MW Impact
CHILHOWEE	CHILHOWEE	0.14
CHOCTAW	CHOCTAW	0.85
COFFEEN	COFFEEN	0.46
COTTONWOOD	COTTONWOOD	3.34
DEARBORN	DEARBORN	0.93
DUCKCREEK	DUCKCREEK	1.02
EDWARDS	EDWARDS	0.47
ELMERSMITH	ELMERSMITH	0.45
FARMERCITY	FARMERCITY	0.3
G-007A	G-007A	2.43
GIBSON	GIBSON	0.18
HAMLET	HAMLET	0.72
NEWTON	NEWTON	1.21
O-066A	O-066A	1.11
PRAIRIE	PRAIRIE	2.21
RENSSELAER	RENSSELAER	1.82
SANTEETLA	SANTEETLA	0.11
SMITHLAND	SMITHLAND	0.17
TATANKA	TATANKA	0.55
TILTON	TILTON	0.56
TRIMBLE	TRIMBLE	0.49
TVA	TVA	1.38
UNIONPOWER	UNIONPOWER	0.61

Bus #	Bus	MW Impact
VFT	VFT	6.42

Appendix 7

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
422714	200675	26E.TWANDA	PENELEC	200674	26TOWANDA	PENELEC	4	PN-P2-3-PN-115-19E	breaker	226.0	105.87	112.06	AC	15.08

Bus #	Bus	MW Impact
200894	26K02	3.72
200949	26X1-109	12.78
918682	AA1-082 E	6.26
919201	AA1-144 O1	17.2
AE1-097	AE1-097	15.08
BAYOU	BAYOU	0.34
BIG_CAJUN1	BIG_CAJUN1	0.51
BIG_CAJUN2	BIG_CAJUN2	1.04
BLUEG	BLUEG	1.76
CALDERWOOD	CALDERWOOD	0.17
CANNELTON	CANNELTON	0.11
CARR	CARR	0.51
CATAWBA	CATAWBA	0.09
CHEOAH	CHEOAH	0.15
CHILHOWEE	CHILHOWEE	0.05

Bus #	Bus	MW Impact
CHOCTAW	CHOCTAW	0.34
COFFEEN	COFFEEN	0.19
COTTONWOOD	COTTONWOOD	1.34
DEARBORN	DEARBORN	0.37
DUCKCREEK	DUCKCREEK	0.41
EDWARDS	EDWARDS	0.19
ELMERSMITH	ELMERSMITH	0.18
FARMERCITY	FARMERCITY	0.12
G-007A	G-007A	1.64
GIBSON	GIBSON	0.07
HAMLET	HAMLET	0.29
NEWTON	NEWTON	0.49
O-066A	O-066A	0.83
PRAIRIE	PRAIRIE	0.89
RENSSELAER	RENSSELAER	0.41
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.07
TATANKA	TATANKA	0.22
TILTON	TILTON	0.22
TRIMBLE	TRIMBLE	0.2
TVA	TVA	0.55
UNIONPOWER	UNIONPOWER	0.24
VFT	VFT	4.64

Appendix 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
546602	200676	26E.SAYRE	PENELEC	130836	N.WAV115	NYISO	1	PN-P2-2-PN-115-070	single	128.0	153.57	169.17	AC	20.84

Bus #	Bus	MW Impact
200823	26MHP_X3-003	4.58
200851	26MEHOOP3	0.7
200917	26MTNTP_P28	0.35
200949	26X1-109	6.52
203283	26MANOR_T86	0.02
913191	Y1-047 OP1	0.24
916051	Z1-038	1.59
916361	Z1-092	1.81
919201	AA1-144 O1	8.85
920351	AA2-133	0.31
934821	AD1-110	0.02
935061	AD1-142	0.1
AA2-200	AA2-200	26.08
AE1-097	AE1-097	20.84
BAYOU	BAYOU	0.29

Bus #	Bus	MW Impact
BIG_CAJUN1	BIG_CAJUN1	0.44
BIG_CAJUN2	BIG_CAJUN2	0.89
BLUEG	BLUEG	1.51
CALDERWOOD	CALDERWOOD	0.14
CANNELTON	CANNELTON	0.09
CARR	CARR	0.81
CATAWBA	CATAWBA	0.08
CHEOAH	CHEOAH	0.13
CHILHOWEE	CHILHOWEE	0.05
CHOCTAW	CHOCTAW	0.29
COFFEEN	COFFEEN	0.16
COTTONWOOD	COTTONWOOD	1.15
DEARBORN	DEARBORN	0.32
DUCKCREEK	DUCKCREEK	0.35
EDWARDS	EDWARDS	0.16
ELMERSMITH	ELMERSMITH	0.16
FARMERCITY	FARMERCITY	0.1
G-007A	G-007A	1.29
GIBSON	GIBSON	0.06
HAMLET	HAMLET	0.24
NEWTON	NEWTON	0.42
O-066A	O-066A	0.65
PRAIRIE	PRAIRIE	0.76

Bus #	Bus	MW Impact
RENSSELAER	RENSSELAER	0.66
SANTEETLA	SANTEETLA	0.04
SMITHLAND	SMITHLAND	0.06
TATANKA	TATANKA	0.19
TILTON	TILTON	0.19
TRIMBLE	TRIMBLE	0.17
TVA	TVA	0.48
UNIONPOWER	UNIONPOWER	0.21
VFT	VFT	3.67

Appendix 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
422683	200936	26WILLMS	PENELEC	200679	26TIFFANY	PENELEC	1	PN-P2-3-PN-115-46G	breaker	162.0	101.34	116.55	AC	24.84

Bus #	Bus	MW Impact
200823	26MHP_X3-003	9.86
200851	26MEHOOP3	1.5
200917	26MTNTP_P28	0.76
294573	P-028 E	19.94
916051	Z1-038	2.4
916351	Z1-091	3.2
AA2-200	AA2-200	24.32
AE1-097	AE1-097	24.84
BAYOU	BAYOU	0.43
BIG_CAJUN1	BIG_CAJUN1	0.66
BIG_CAJUN2	BIG_CAJUN2	1.32
BLUEG	BLUEG	2.28
CALDERWOOD	CALDERWOOD	0.21
CANNELTON	CANNELTON	0.14
CARR	CARR	0.81

Bus #	Bus	MW Impact
CATAWBA	CATAWBA	0.12
CHEOAH	CHEOAH	0.19
CHILHOWEE	CHILHOWEE	0.07
CHOCTAW	CHOCTAW	0.43
COFFEEN	COFFEEN	0.24
COTTONWOOD	COTTONWOOD	1.71
DEARBORN	DEARBORN	0.49
DUCKCREEK	DUCKCREEK	0.53
EDWARDS	EDWARDS	0.25
ELMERSMITH	ELMERSMITH	0.23
FARMERCITY	FARMERCITY	0.16
G-007A	G-007A	2.7
GIBSON	GIBSON	0.09
HAMLET	HAMLET	0.35
NEWTON	NEWTON	0.63
O-066A	O-066A	1.36
PRAIRIE	PRAIRIE	1.15
RENSSELAER	RENSSELAER	0.67
SANTEETLA	SANTEETLA	0.06
SMITHLAND	SMITHLAND	0.09
TATANKA	TATANKA	0.29
TILTON	TILTON	0.29
TRIMBLE	TRIMBLE	0.25

Bus #	Bus	MW Impact
TVA	TVA	0.71
UNIONPOWER	UNIONPOWER	0.31
VFT	VFT	7.65