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June 6, 2011

Via Hand Delivery and Electronic Mail
NH Site Evaluation Committee
c/o Jane Murray, Secretary
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Re: Docket 2010-01, Application of Groton Wind, LLC for a Certificate of Site and Facility for a Renewable Energy Facility

Dear Ms. Murray:

Enclosed for filing with the Site Evaluation Committee in the above-captioned docket, please find an original and nine copies of a document entitled "Feasibility Study Report for the Proposed Wind Project Queue #345 Interconnecting in New Hampshire." Also enclosed for filing in the above-captioned docket please find an original and nine copies of an electronic correspondence from ISO-New England indicating that the above-referenced Feasibility Study is "complete" for all intents and purposes, and has been labeled "draft" just to indicate a procedural status within the ISO-New England process. These documents update information contained in the Groton Wind Application at Volume III, Appendix 13.

Please contact me if there are any questions about this filing. Thank you for your assistance and cooperation.

Very truly yours,

S A Geiger

Susan S. Geiger

cc: Service List (electronic mail only)
Enclosures
768430_1.DOC

R105-10 - Draft

Feasibility Study Report for the Proposed Wind Project Queue #345 Interconnecting in New Hampshire

Prepared for

ISO-New England, Inc.

Submitted by:
David Lovelady, Consultant
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Baldwin P. Lam, Senior Manager

January 20, 2011
March 10, 2011, Revision 1
April 20, 2011, Revision 2

Siemens PTI Project Number: P/21-113536

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Contents

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Executive Summary

Siemens Energy, Inc., Siemens Power Technologies International (Siemens PTI), has conducted a Feasibility Study ("Study") under the ISO New England (ISO-NE) Open Access Transmission Tariff ("Tariff") Schedule 22-Standard Large Generator Interconnection Procedures ("LGIP") on behalf of ISO-NE for the interconnection of the Q345 Wind project ("the Project") to the New England transmission system.

The Project consists of 24 Gamesa 2.0 MW wind turbine generators (WTG's) and the associated collector system. The maximum aggregated output of the WTG's will be 48 MW. The Project net output at the point of interconnection (POI) is, approximately, 46 MW. The Project service load is negligible.

The proposed commercial operation date for this Project is December of 2012.

The Feasibility Study was performed to assess the Projects impact on the transmission system for the following two Points of Interconnection ("POI's") in New Hampshire:

- Option 1 ("POI -1") – The Project interconnects to Beebe River 115 kV Substation via a single circuit breaker.

- Option 2 ("POI-2") – The Project interconnects to the E115 line at 3.5 miles south of Beebe River 115 kV Substation through a new three-breaker ring Switching Station.

The Study was performed for 2013 peak, shoulder and light load conditions. The short circuit analysis was conducted by Public Service of New Hampshire (PSNH). This report presents the results of the steady state and short circuit studies.

At the time this study was conducted information on the capacitor banks required by the higher queued project Q305 was not available; therefore; the analysis was performed without considering those capacitors. Once information on the capacitors was available, a sensitivity study with those capacitors was performed; the results of the sensitivity study are documented in this report.

Results for Base Case Conditions (N-0 Analysis)

No thermal or voltage violations caused by the Project were found during base case conditions.

Thermal Results for All Lines in Service (N-1 Analysis)

The study thermal results show that the Project does not have an adverse impact for any of the two interconnection options studied.

Voltage Results (N-1 Analysis)

POI – 1 (Interconnection at Beebe River Substation)

1) Post-contingency low voltages were found at the following 115 kV buses during peak load conditions,

- Interval, Saco Valley, Saco PAR and Saco PAR2 during the loss of the 214 line (Lovell-Saco Valley 115 kV). Low voltages do not occur without the Project.
- Pemigewasset, Ashland and Ashland tap during the Webster 115 kV stuck breaker #2 contingency. Low voltages do not occur without the Project.

2) Post-contingency high voltages were found at the following 115 kV buses for several contingencies during shoulder and light load conditions,

- Beebe River, Tamworth, White Lake and the Project 115 kV collector bus. Some of these high voltages also occur without the Project. All high voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River and White Lake post-contingency.

POI – 2 (Interconnection at New 3-Breaker Substation on E115 Line)

1) Post-contingency low voltages were found at the following 115 kV buses during peak load conditions,

- Interval, Saco Valley, Saco PAR and Saco PAR2 during the loss of the 214 line (Lovell-Saco Valley 115 kV). Low voltages do not occur without the Project.
- Pemigewasset during the Webster 115 kV stuck breaker #2 contingency. Low voltages do not occur without the Project.

2) Post-contingency high voltages were found at the following 115 kV buses for several contingencies during peak, shoulder and light load conditions,

- Beebe River, Tamworth, White Lake, the Project POI-2 and Project 115 kV collector buses. Some of these high voltages also occur without the Project. All high voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River and White Lake post-contingency.

Sensitivity Voltage Analysis with Q305 Capacitors

Voltage testing was performed with 3 x 7.2 Mvar capacitors required by project Q305 which interconnects at Pemigewasset Substation.

The sensitivity testing still show low voltage violations for both interconnection options, although those voltages are higher than those identified in the main study without capacitors at project Q305. High voltage violations were also identified; the high voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River Substation.

It was verified that 2 x 7.2 Mvar capacitor banks installed at the Project 115 kV collector bus will eliminate all low voltage violations for both interconnection options. Should project Q305 drop out of the queue, additional capacitors may be required for the interconnection of Q345.

Short Circuit Analysis

The addition of the 48MW wind powered facility for either proposed connection will not cause any PSNH Transmission breakers to become overdutied or exceed 80% of their current rating. For all breaker rating studies, a pre-fault voltage of 1.05pu is used.

Cost Estimates

The cost estimates (-50% / +200%) for the two interconnection options are provided below. The estimates do not include any work for the possible 115 kV capacitor banks.

- New position at Beebe River Substation: $1,678k - $6,714k. ROW easements and construction of new transmission line are not included.

- New three-breaker 115 kV Substation: $5,787k - $23,150k. Substation land, ROW easements and construction of new transmission line are not included.

Section

1

Introduction

Siemens Energy, Inc., Siemens Power Technologies International (Siemens PTI), conducted a Feasibility Study ("Study") of Project Q345 ("the Project") under the ISO New England (ISO-NE) Open Access Transmission Tariff ("Tariff") Schedule 22-Standard Large Generator Interconnection Procedures ("LGIP") and Network Capability Interconnection Standard ("NCIS"), PP5-6 on behalf of ISO-NE. This document presents the Feasibility Study Report.

The Project consists of 24 Gamesa 2.0 MW wind turbine generators (WTG's) and the associated collector system. The maximum aggregated output of the WTG's will be 48 MW. The Project net output at the point of interconnection (POI) is, approximately, 46 MW. The Project service load is negligible.

The proposed commercial operation date for this Project is December of 2012.

The Project will interconnect to the Public Service of New Hampshire (PSNH) system in New Hampshire. The Study was performed to assess the Project impact on the transmission system for the following two Points of Interconnection ("POI's"):

- Option 1 ("POI -1") – The Project interconnects to Beebe River 115 kV Substation via a single circuit breaker.

- Option 2 ("POI-2") – The Project interconnects to the E115 line at 3.5 miles south of Beebe River 115 kV Substation through a new three-breaker ring Switching Station.

Siemens PTI performed N-1 contingency analysis as part of the study. The short circuit study was performed by PSNH and the corresponding results are included in this report.

Section

2

Project Description

2.1 Project Description and Interconnection Plan

The Project consists of 24 Gamesa 2.0 MW wind turbine generators (WTG's) with a maximum aggregated output of 48 MW. The service load is negligible. Each WTG will be connected to the 34.5 kV collector system via its own 0.6/34.5 kV generator step-up transformer (GSU). Two 34.5 kV overhead lines will carry the power from four (4) wind turbine strings to the Project's 34.5 kV Switching Yard; the lines will have an approximate length of 7,000 feet and 10,000 feet, respectively.

Two POI's were considered:

For POI-1, two (2) 34.5 kV overhead lines with a length of 73,000 feet and 76,000 feet, respectively, will connect the Project's Switching Yard to the Project's Collector Substation located adjacent to the Beebe River Substation. A 50 MVA 34.5/115 kV transformer at the Collector Substation and a 500 feet cable will connect the Project to the Beebe River 115 kV bus via a single breaker.

For POI-2, two (2) 34.5 kV overhead lines with a length of 52,000 feet and 55,000 feet, respectively will connect the Project's Switching Yard to the Project's Collector Substation located adjacent to a new 115 kV three-breaker ring Switching Station on the E115 line. A 50 MVA 34.5/115 kV transformer at the Collector Substation and a 500 feet cable will connect the Project to the new three-breaker Switching Station.

The developer provided a detailed layout showing the individual wind turbine generators and feeders. As such, the entire wind farm was explicitly modeled for this Study, including each WTG, GSU, underground feeder cable and all overhead lines.

Figures 2-1 and 2-2 show one-line diagrams for the power system in the vicinity of the Project for POI-1 and POI-2, respectively. A simplified version of the Project is shown in the diagrams for illustration purposes. However, in the study the Project was represented by a detailed power flow model. The IDEV's to incorporate the Project to the PSS®E database are included in Appendix E.

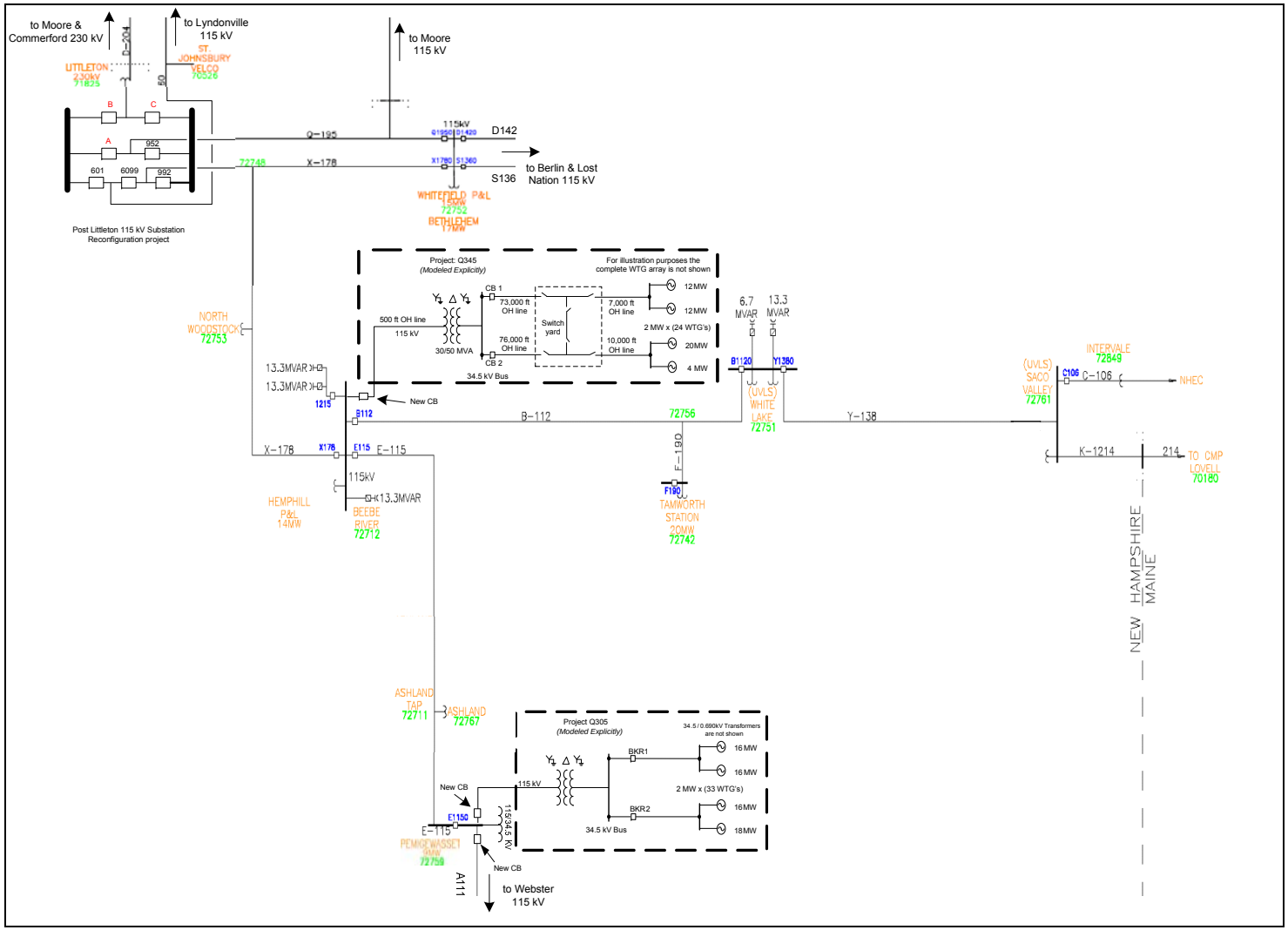

Figure 2-1 Project Interconnection and Buses Nearby for POI-1

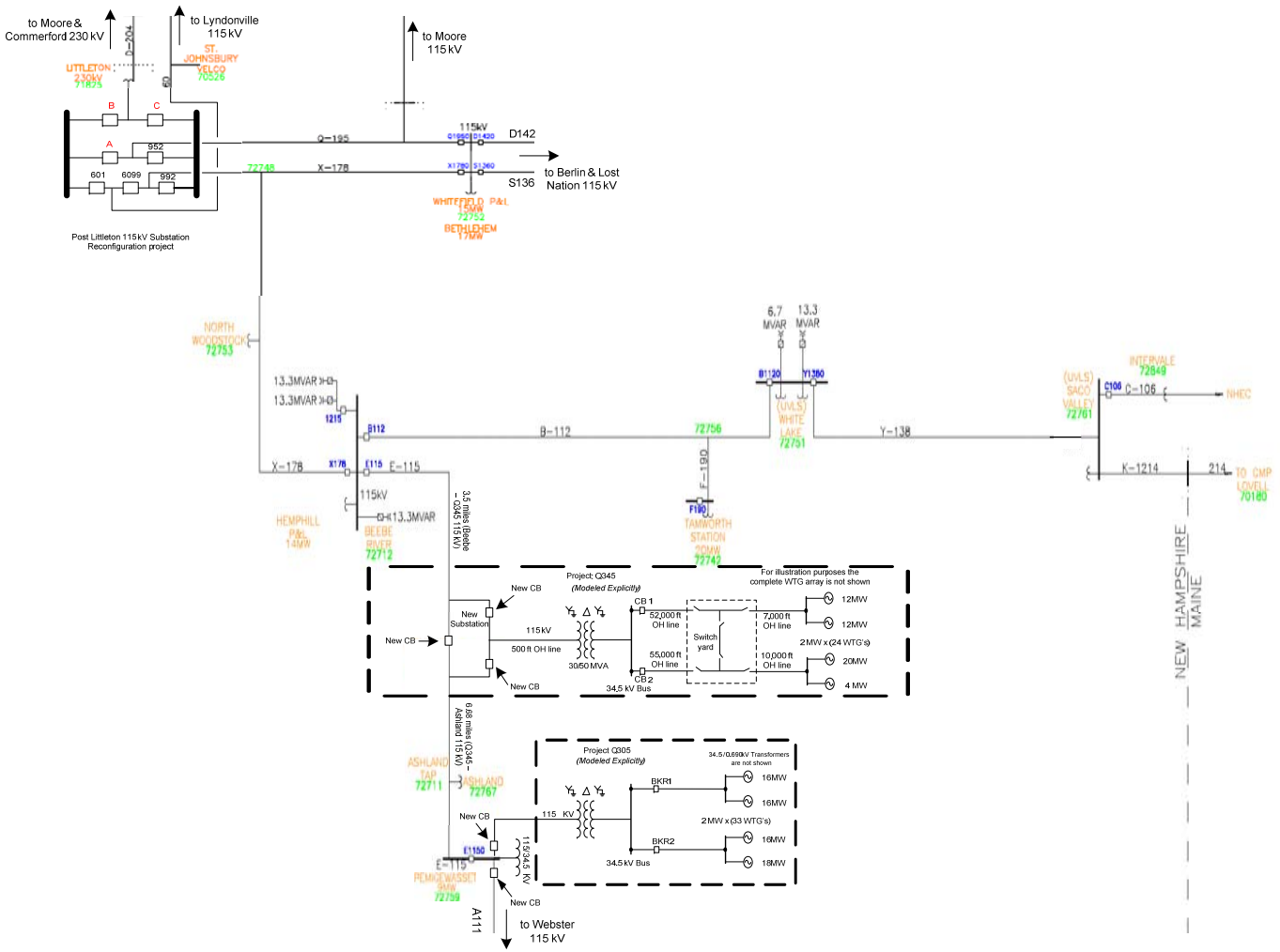

Figure 2-2 Project Interconnection and Buses Nearby for POI-2

Figure 2-3 below illustrates the approximate geographical location of the Project and the transmission lines in the area of interest.

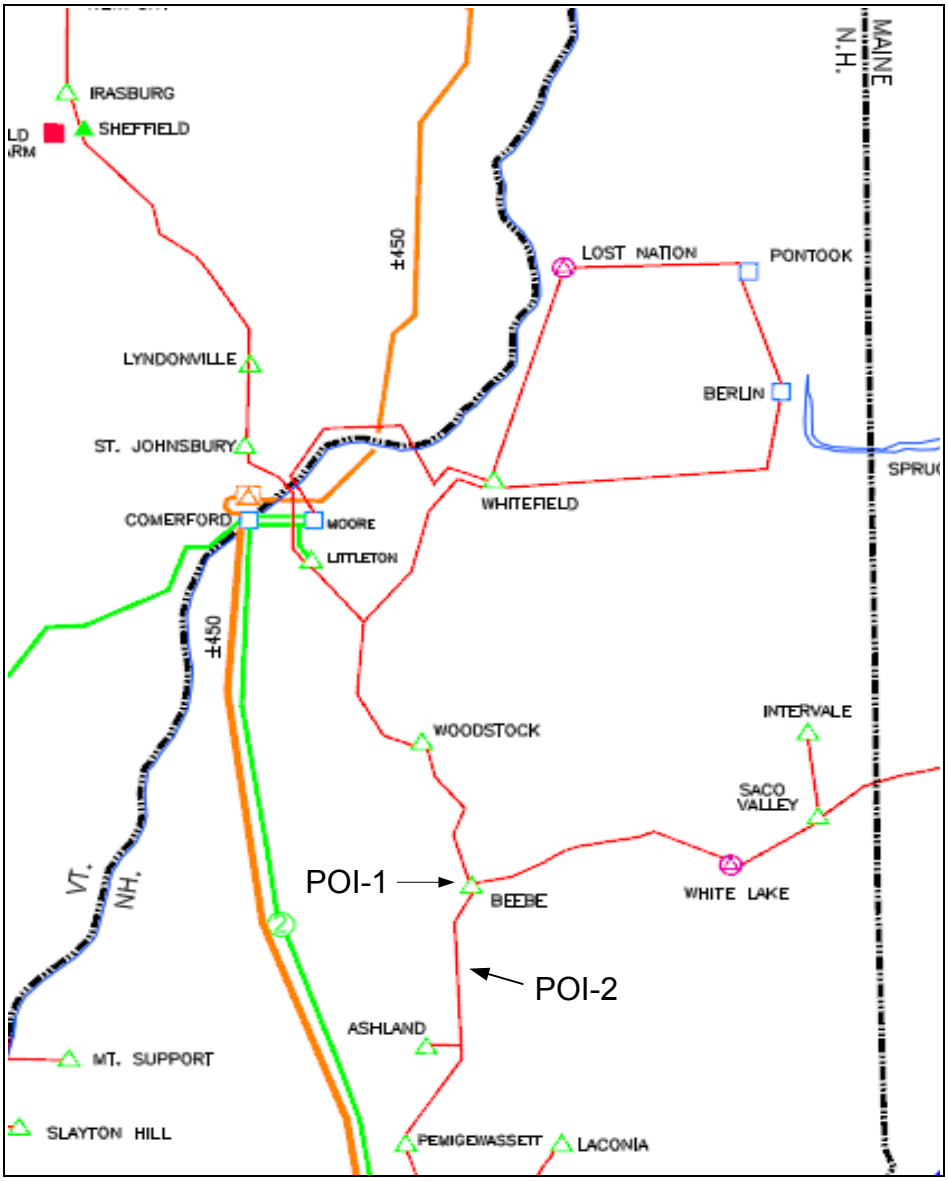

Figure 2-3 Project Geographical Location in New Hampshire

2.2 Project Data

The Project data for each wind turbine generator and the corresponding generator step-up (GSU) transformer are shown in Tables 2-1 to 2-2, respectively.

Table 2-1 Wind Turbine Generator (WTG) Data

Ratings of each Wind Turbine Generator	2.197 MVA, 690 V
Gross Output of each wind generator	2.0 MW
Exporting Reactive Power Limit at 2.0 MW output (each wind turbine)	0.655 Mvar (0.95 power factor)
Importing Reactive Power Limit at 2.0 MW output (each wind turbine)	-0.655 Mvar (0.95 power factor)
Station Service Load	When the WTG's are online, the service load is negligible. Service load is 1MW and 0.5MVAr for the entire wind farm when all WTG's are offline.
X"dv (per unit based on rated MVA)	0.131
X'_{dV} (per unit based on rated MVA)	0.170
X_{dV} (per unit based on rated MVA)	4.458
X_{2dV} (per unit based on rated MVA)	0.144
X_{0V} (per unit based on rated MVA)	0.390
X_{lm}	0.23

Table 2-2 Wind Unit GSU Transformer Data

Nameplate ratings (self cooled/maximum)	2.35/2.35 MVA
Voltage ratio, generator side/system side	0.69/34.5 kV
Winding connections, low voltage/high voltage	Delta/Wye grounded
Available Tap positions (set to center tap for study)	+/- 5 % of nominal
Impedance, Z_1 (on self cooled MVA rating)	11.6%, X/R = 11.3
Impedance, Z_0 (on self cooled MVA rating)	9.3%, X/R = 9.1

The parameters of the main transformer are shown in Table 2-3 below.

Table 2-3 Main Transformer at Collector Station

Nameplate ratings (self cooled/maximum)	30/50 MVA
Voltages, High/Low voltage/Tertiary	115/34.5/13.2 kV
Winding connections, High/Low/Tertiary	Wye grounded/Wye grounded/Delta
Available Tap positions (set to center tap for study)	95%, 97.5%, 100.0%, 102.5%. 105.0%
Impedance Z_1 (% on self cooled MVA rating)	9.0 %, X/R = 30
Impedance Z_0 (% on self cooled MVA rating) High - Wye	0.617 + j6.91
Impedance Z_0 (% on self cooled MVA rating) Low - Wye	0.018 + j0.052
Impedance Z_0 (% on self cooled MVA rating) Tertiary - Wye	0.366 + j3.30

Table 2-4 below shows the parameters of the two 34.5 kV overhead lines that will connect the WTG strings to the 34.5 kV Switching Yard for both POI options.

Table 2-4 34.5 kV Overhead Line Feeder Data – 100 MVA, 34.5 kV bases

Circuit No	Length (feet)	Positive Sequence – Per Unit			Zero Sequence –Per Unit	
		R	X	B	R	X
1	7,000	0.016055	0.041756	0.00	0.121327	0.255829
2	10,000	0.022936	0.059651	0.00	0.173325	0.365469

Table 2-5 and Table 2-6 below show the parameters of the two 34.5 kV overhead lines that will connect the Project's 34.5 kV switching yard to the 34.5 main collector bus for POI-1 and POI-2, respectively.

Table 2-5 34.5 kV Overhead Line from Switching Yard to Collector bus for POI-1

Circuit No	Length (feet)	Positive Sequence – Per Unit			Zero Sequence –Per Unit	
		R	X	B	R	X
1	73,000	0.179945	0.442546	0.00	1.314657	2.687704
2	76,000	0.187440	0.466843	0.00	1.381836	2.799790

Table 2-6 34.5 kV Overhead Line from Switching Yard to Collector bus for POI-2

Circuit No	Length (feet)	Positive Sequence – Per Unit			Zero Sequence –Per Unit	
		R	X	B	R	X
1	52,000	0.131779	0.317278	0.00	0.950674	1.920218
2	55,000	0.139273	0.341575	0.00	1.017853	2.032304

Table 2-7 below shows the parameters of the 115-kV transmission lead that will connect the 115 kV side of the main transformer to either POI-1 or POI-2.

Table 2-7 115 kV Overhead Transmission Line to POI-1 or POI-2

Length (feet)	Positive Sequence – Per Unit			Zero Sequence –Per Unit	
	R	X	B	R	X
500	0.000080	0.004950	0.000072	0.000280	0.001860

For the electrical data of the complete WTG array underground cables between each WTG, see Appendix E for the project IDV file used to the model the project in PSS®E.

2.3 Project Power Flow Model

The voltage at the WTG terminal buses was set to 1.05 per unit to maximize the reactive power output of the WTG's while keeping the reactive power output of the individual wind generators within their reactive power limits. It was verified that voltages inside the wind farm were within the 0.95-1.05 per unit range. The power flow one-line diagrams for the Project interconnection options POI-1 and POI-2 are shown in Figure 2-4 and 2-5, respectively, for peak load conditions.

Figures 2-4 and 2-5 show the Project and nearby buses for the peak load base cases and both POI-1 and POI-2

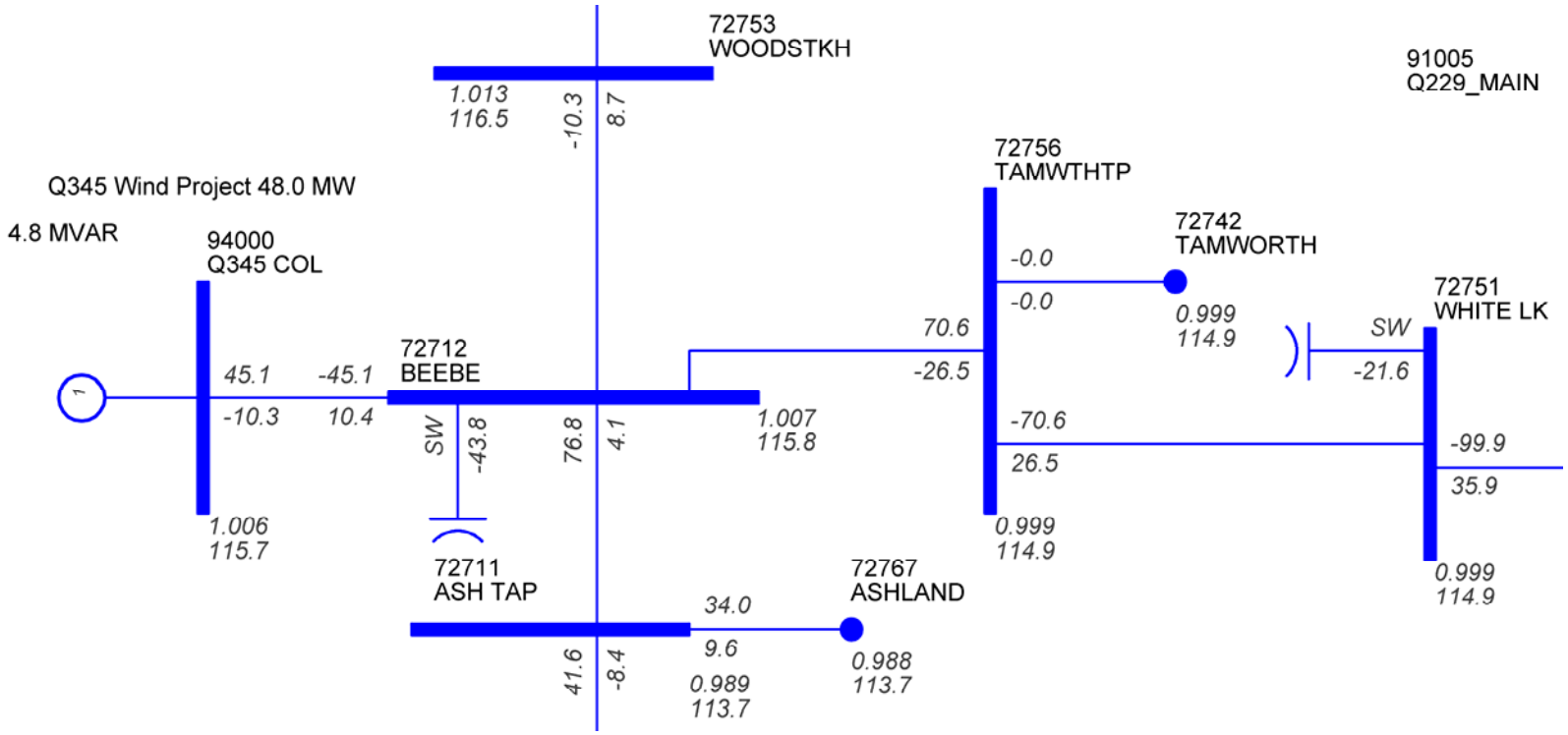

Figure 2-4 Peak load Project Power Flow One-Line Diagram for POI-1

(Aggregated Project Gross Output shown)

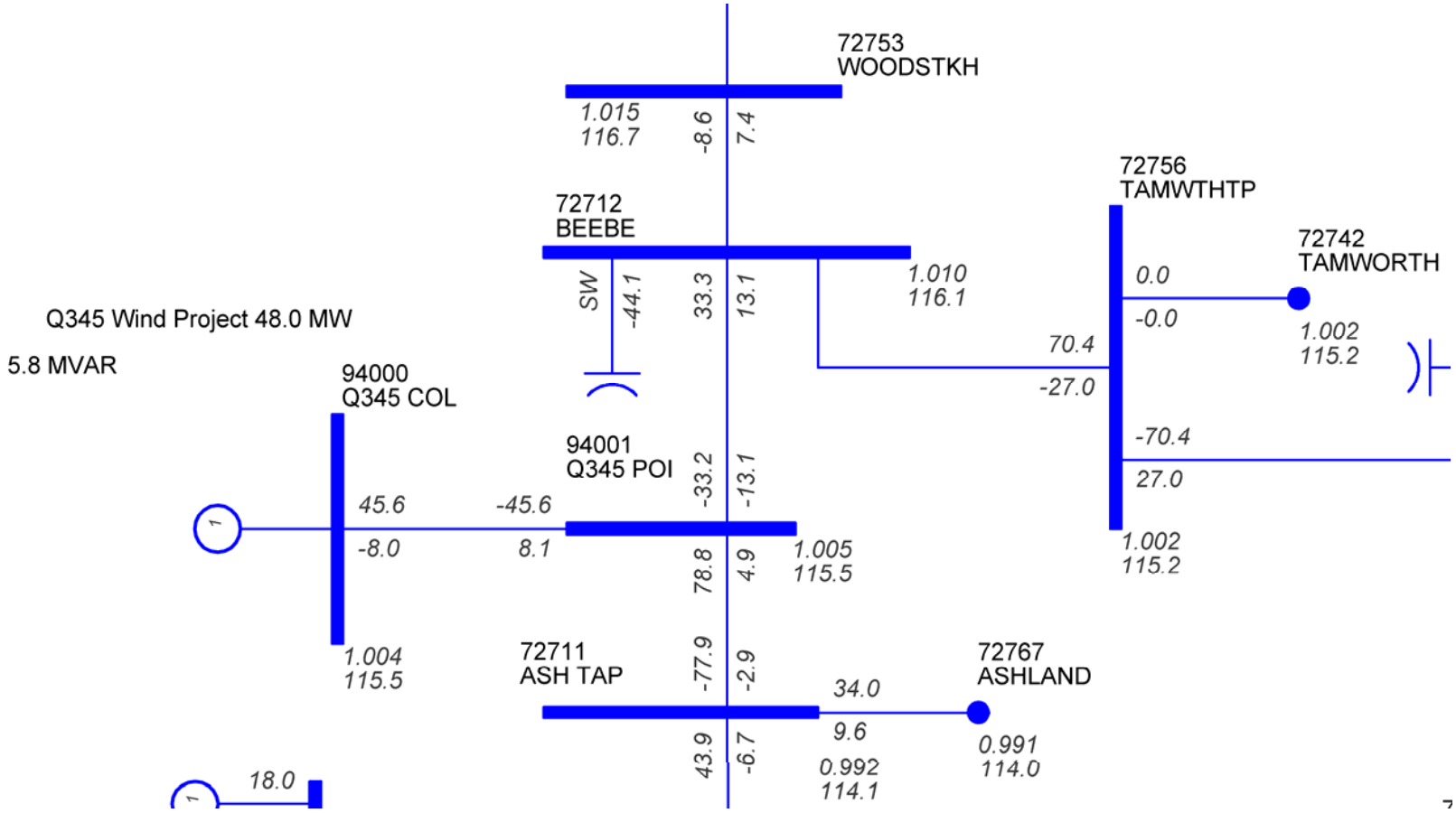

Figure 2-5 Peak load Project Power Flow On-Line Diagram for POI-2

(Aggregated Project Gross Output shown)

Section

3

Study Methodology

3.1 Introduction

The Study was performed under the ISO New England (ISO-NE) Open Access Transmission Tariff ("Tariff") Schedule 22-Standard Large Generator Interconnection Procedures ("LGIP"), and in accordance with:

- Northeast Power Coordinating Council (NPCC) Document A-2 "Basic Criteria for Design and Operation of Interconnected Power Systems".
- Interconnection Procedures contained in Schedule 22 of the Tariff.
- ISO-NE Planning Procedure No. 3, "Reliability Standards for the New England Area Bulk Power System" (June 2009).
- ISO-NE Planning Procedure No. 5-3, "Guidelines for Conducting and Evaluating Proposed Plan Application Analyses".
- ISO-NE Planning Procedure 5-6 (PP5-6), "Network Capability Interconnection Standard ("NCIS")".
- ISO-NE Operating Documents.
- Transmission Reliability Standards for Northeast Utilities (May 2008).

Pursuant to Schedule 22, the Study was performed as a Steady State Feasibility Study. The Study includes the identification of:

- Any thermal overload of any transmission facility or system voltage limit violations resulting from the Project.
- Any circuit breaker or other facility short circuit capability limit that are exceeded as a result of the Project, as determined from a short circuit study conducted by Northeast Utilities.

3.2 Criteria

The analysis reported in this document was performed for normal conditions with all lines in service, for both pre-Project and post-Project cases, to identify thermal and voltage problems that may be attributed to the Project.

3.2.1 Voltage Criteria

Table 3-1 shows the voltage criteria that were applied in the study.

Table 3-1 Normal and Emergency Voltage Criteria

VOLTAGE LEVEL	BUS VOLTAGE LIMITS -% of Nominal	
	Pre-contingency	Post-contingency
Seabrook 345 kV Station	100 to 105%	100 to 105%
Vermont Yankee 345 kV Station	98.5 to 105%	98.5 to 105%
Vermont Yankee 115 kV Station	100 to 105%	100 to 105%
230 kV and above	98 to 105%	95 to 105%
69 kV and 115 kV	95 to 105%	95 to 105%

3.2.2 Thermal Criteria

Table 3-2 Thermal Criteria

SYSTEM CONDITION	MAXIMUM ALLOWABLE FACILITY LOADING
Pre-contingency	Normal rating
Post-contingency	Long Time Emergency Rating (LTE)

3.3 Thermal and Voltage Analysis

Power flow cases were tested for both thermal and voltage violations. The AC contingency analysis function of Siemens PTI's PSS®E Version 30 was used to compare the steady state performance of the New England interconnected system, with and without the proposed Project.

If the system steady state performance did not meet the study criteria, transmission reinforcement options (e.g. line upgrades, shunt compensation, etc) were recommended.

3.3.1 Thermal Analysis

The pre-Project power flow base cases were adjusted to ensure there is no pre-Project N-1 or N-0 overloads. During the contingency analysis, the loading of any monitored element found to be higher than 95% of LTE rating was reported.

3.3.2 Voltage Analysis

The pre-Project load flow base cases were adjusted to ensure there is no relevant pre-project voltage criteria violations. During the contingency analysis, the voltage of any monitored bus found to be outside the range of the post-contingency criteria was reported.

3.3.3 Contingencies

The list of contingencies that were considered in the study is presented in Appendix C. The list includes new contingencies due to network changes associated with the Project and prior queued projects. Contingencies associated with the new proposed configuration at Littleton were considered. Contingencies associated with the Lyndonville reliability project were considered.

3.3.4 Monitored Elements

The Project will be located in Zone 560 (NH-CNTRL). Facilities rated at 69 kV and above in the zones listed in Table 3-3 were monitored for possible thermal and voltage criteria violations.

Table 3-3 Monitored Zones

Zone No.	Zone Name
8	CMP
21	NEP-NH
28	(Beebe, White Lake, Saco PAR)
41	VELCO-VT
80	NEP-MV
100	NEP-CENT
545-549	NH-SEACO
550-553	NH-MANCH
555-558	NH-KEENE
560-563	NH-CNTRL
565-568	NH-NORTH

3.3.5 Power Flow Solution Options

The ACCC activity of Siemens PTI PSS®E software was used. The pre-contingency and post-contingency solution options that were used in the Study are summarized in Table 3-4 below.

Table 3-4 Power Flow Solution Options

Case	Transformer Taps	Phase Shifters	DC Taps	Switchable Shunts	Area Interchange Control
Pre-Contingency	Stepping	Regulating	Regulating	Regulating	Enabled
Post-Contingency	Stepping	Locked at pre-contingency setting	Locked at pre-contingency setting	Locked at pre-contingency setting	Disabled

Also, for pre-contingency and post-contingency conditions, the Var limits of generators were observed and applied immediately at the start of the power flow solution.

Section

4

Base Cases and Generation Dispatch

4.1 Development of Base Cases

Power flow cases representing 2013 peak, shoulder and light load conditions were used in the Study. The peak and shoulder cases were developed from a 2007 series, NERC/MMWG base case library power flow case modeled with 2008 peak loads provided by ISO-NE. The light load cases were developed from a 2012 spring light load case provided by ISO-NE based on a 2006 NPCC library case.

During the preparation of the power flow cases, the New England peak load was scaled to the 90/10 summer peak level of the 2010 CELT forecast for year 2013. The New England 2013 shoulder loads were obtained by scaling the summer 90/10 peak load down to 75% of the 50/50 summer peak of the 2010 CELT forecast for year 2013. The New England light load was modeled at 45% of the 50/50 summer peak.

Table 4-1 below, shows the New England (NE) loads and the transmission losses in the peak, shoulder and light load post-Project base cases that were considered in the study.

Table 4-1 NE Load and Losses for 2013 (MW)

	Load	Losses	Total
Peak	29,972	875	30,847
Shoulder	20,778	650	21,428
Light	12,396	479	12,875

The following approved projects and their associated upgrades were assumed in service and modeled in the base cases:

- Closing of the Y138 line from White Lake 115 kV Substation to Saco Valley 115 kV Substation.
- 115 kV capacitors at Beebe and White Lake substations.
- Monadnock project.
- Q166 Granite Wind project (99 MW) interconnecting on the W179 line.

- Q172 wind project (40 MW) interconnecting in Vermont on the St. Johnsbury-Irasburg line.
- Q197 wind project (50 MW), named “RHWCOLL” in the power flow cases, interconnecting in Maine to the Rumford 115 kV Substation.
- Q215 wind project (50 MW), named “LFCOLL” in the power flow cases, interconnecting in Maine on the Rumford-Roxbury 115 kV line. Roxbury 115 kV Substation is added for project Q197.
- Southern Loop transmission project.
- Q229 CPD Berlin Biomass project (29 MW).
- Q251 Laidlaw Berlin Biomass project (65.9 MW) plus associated line rating upgrades of the following 115 kV lines caused by the project: -

- O154 line (Paris-Lost Nation 115 kV) upgraded to 129/140/177 (Normal/LTE/STE) MVA.
- D142 line (Lost Nation to Whitefield 115 kV) upgraded to 118/140/148 MVA.
- S136 line (Whitefield to Berlin 115 kV) upgraded to 159 MVA for all ratings.

- Q287 wind project (33 MW), named “S0X_GEN” in the power flow cases, interconnecting to a new 115 kV Substation tapping the Rumford IP to Riley 115 kV line in Maine.
- Q290 wind project (18 MW), named “SPRUCEG1” in the power flow cases, interconnecting in Maine to the Woodstock 115 kV Substation.
- Q291 Merrimack G2 up-rate to the following ratings: gross output 356 MW, gross over-excited 120 MVAr, gross under-excited 43 MVAr with a service station load of 16 MW and 9 MVAr.
- Q300 wind project (20 MW), named “T0X_GEN” in the power flow cases, interconnecting to the new 115 kV Substation that taps the Rumford IP to Riley 115 kV line in Maine.
- Q305 wind project (66 MW), interconnecting to Pemigewasset 115 kV Substation.
- Q307 Biomass (12.5 MW) interconnecting to the 34.5 kV system adjacent to Moore 34.5 kV Substation.
- Q312 Biomass (20 MW) interconnecting to Winchester 34.5 kV Substation in New Hampshire.
- Q323 wind project up-rate of former project Q290 to 20 MW (increase of 2 MW) in Maine.

- Lyndonville reliability project, that adds a four breaker Substation, a 115/34.5 kV transformer and two 12.5 MVAr capacitors. The project taps the St Johnsbury to Sheffield 115 kV line in Vermont.

The following additions/changes were made to the cases: -

- The Granite phase shifters were set to zero degrees with the controlled tie left floating.
- The switch connecting the Q195 to Littleton 115 kV Substation was modeled closed in the Study as part of the Q166 project proposed upgrades.
- The Bliss PAR and the PV20 PAR were modeled to regulate flows of 0 and100 MW into New England, respectively.
- Wind project (Q172) reactive output was set to 0 Mvar.
- The Merrimack to Gregg 115 kV (CKT #2) line ratings were updated to summer ratings of 191/236/275 MVA for normal, LTE and STE respectively.
- Capacitors at Merrimack and Comerford turned on to reduce local generation reactive output.
- Contingencies associated with the new proposed Littleton configuration will be considered.
- The following changes where made following the issuance of (Reference Document for Base Modeling of Transmission System Elements in New England 1/29/10) and the OP guide: -

- Saco Valley PST active power control set to regulate power flow between 95 -105 MW (set to automatic control for pre-contingency conditions and fixed for post-contingency conditions).
- Saco Valley voltage-load tap control set to 117 kV nominal tap with plus or minus 2 kV for automatic control (set to automatic control for all system conditions).
- White Lake and Beebe 115 kV capacitor banks set to hold voltage at 117 kV +2kV (set to automatic control for all system conditions).

- Merrimack 230/115 kV auto transformer updated to match the latest NX9 database.
- The following several generating units on the 34.5 kV distribution network near to the Webster Substation were changed from bus type 1 (offline) to type 2 (online): North 34 (14 MW), Laconia (3 MW), Webster (6 MW), Oakhill (26 MW) and Garvins (10 MW).

4.2 Project Dispatch

The Project dispatch is shown in Table 4-2.

Table 4-2 Project Dispatch (MW)

Unit	Pre-Project Case	Post-Project Case
Project Queue #345 (net)	0	46
Alexandria	17	4
Bridgewater	15	0
Tamworth	20	0

4.3 Generation Dispatch

The generation dispatch in New Hampshire, Maine and Vermont is shown in Table 4-3, along with relevant interface flows. Power flow summaries and power flow one-line diagrams are shown in Appendix A and Appendix B, respectively.

Table 4-3 Generation Dispatch – Post Project (Gross MW)

	Peak	Shoulder	Light
New Hampshire Generation			
COMERFORD G1	24	24	24
COMERFORD G2	48	48	48
COMERFORD G3	48	48	48
COMERFORD G4	48	48	48
MOORE G1	48	0	48
MOORE G2	48	48	48
MOORE G3	48	48	48
MOORE G4	48	48	48
GRANITE RIDGE G1	280	0	0
GRANITE RIDGE G2	280	0	0
AES STG	264	264	0
CONED NEWINGTON 1	169	169	169
CONED NEWINGTON 2	169	169	169
CONED NEWINGTON 3	195	0	0
TAMWORTH	0	0	0
SMITH HY	0	0	0

	Peak	Shoulder	Light
PONTOOK HYDRO	0	0	0
JACKMAN (total of two units)	13	12	12
NORTH 34	14	14	14
BRIDGEWATER	0	0	0
LACONIA	3	3	3
WEBSTER	6	0	6
AYERS	9	9	9
WHITEFIELD	0	0	0
BERLIN	14	14	14
MERRIMACK G1	113	113	0
MERRIMACK G2	356	356	0
NEWINGTON G1	0	0	0
SEABROOK G1	1318	1318	1318
SCHILLER 4	48	0	0
SCHILLER 5	50	0	0
SCHILLER 6	48	0	0
WL JET	18	18	0
LOST NATION	0	0	0
OAK HILL	26	13	26
ALEXANDRIA	4	4	4
WIND PROJECT QUEUE #166	18	9	12
BIOMASS PROJECT QUEUE #229	0	0	0
BIOMASS PROJECT QUEUE #251	0	0	0
WIND PROJECT QUEUE #305	66	66	0
BIOMASS PROJECT QUEUE #307	12.5	12.5	12.5
BIOMASS PROJECT QUEUE #312	18	18	18
WIND PROJECT QUEUE #345 (“WTG-NX”)	48	48	48
MAINE GENERATION			
MIS GT1	179	159	157
MIS GT2	179	160	158
MIS ST	191	176	0
YARMOUTH 1	50	0	0
YARMOUTH 2	50	0	0
YARMOUTH 3	95	0	0

	Peak	Shoulder	Light
YARMOUTH 4	636	636	0
WESTBROOK G1	185	174	184
WESTBROOK G2	185	174	184
WESTBROOK G3	196	189	187
BUCKSPORT G4	0	0	0
CHAMP G3	0	0	0
Q197 Wind	0	0	0
Q215 Wind	50	50	0
Q287 WIND PROJECT (“S0X_GEN”)	33	30.25	8.25
Q290	18	18	18
Q300 WIND PROJECT (“T0X_GEN“)	19.25	19.25	19.25
Q323 WIND UP-RATE OF Q290	2 (total of 20)	20 (total of 20)	20 (total of 20)
VERMONT GENERATION			
VERMONT YANKEE	667	667	667
Q172 WIND	40	0	40
VPPSA	48	48	48
ESSEX 19	8	8	8
Phase II	2000	1000	0
Highgate	211	211	194
INTERFACES			
NB-NE	1000	999	1001
MAINE-NH	1692	1797	1560
CMFD/MOORE-SO	287	268	380
ORRINGTON SOUTH	1227	1178	1151
SUROWIEC SOUTH	909 (1)	1058 (1)	1038(1)
NNE-SCOBIE+394	2740	2774	2611
NORTH-SOUTH	2736 (1)	3015	3228

Note: (1) Unable to obtain higher interface flows in the study case whilst maintaining the other interfaces.

Section

5

Thermal and Voltage Analysis

Thermal and voltage analyses with all lines in service (N-1 analysis) were carried out to determine the thermal and voltage impacts of the Project on the performance of the power system within the study area. The peak, shoulder and light load scenarios described in Section 4 were evaluated pre and post Project.

Two Points of Interconnection ("POI's") were analyzed:

- Option 1 ("POI -1") – The Project interconnects to the Beebe River 115 kV Substation via a single circuit breaker.
- Option 2 ("POI-2") – The Project interconnects to the E115 line at 3.5 miles south of Beebe River 115 kV Substation through a new three circuit breaker ring 115 kV Switching Station.

The reliability project "Lyndonville" that taps the St Johnsbury to Sheffield 115 kV line in Vermont was included in the analysis. Also contingencies associated with this project were included.

Contingencies associated with the new proposed configuration ('Littleton 115-kV Reconfiguration project') were considered. This project has ISO-NE PPA approval.

At the time this study was conducted information on the capacitor banks required by the higher queued project Q305 was not available; therefore; the analysis was performed without considering those capacitors.

5.1 Results for Normal Conditions (N-0)

No adverse thermal or voltage impacts were found with all lines in service. Post-Project voltages at Beebe 115 kV Substation are shown in Table 5-1 below.

Table 5-1 N-0 Voltages at Beebe 115 kV Substation

	Light Load	Shoulder Load	Peak Load
pre-Project	117.1 kV (1.0183 pu)	118.0 kV (1.0262 pu)	116.6 kV (1.0141 pu)
post-Project POI-1	118.3 kV (1.0285 pu)	118.9 kV (1.0337 pu)	115.8 kV (1.0069 pu)
post-Project POI-2	118.2 kV (1.0279 pu)	117.2 kV (1.0194 pu)	115.5 kV (1.0046 pu)

5.2 N-1 Thermal Results

Tables 5-2 to 5-6 below summarize the N-1 thermal results. No thermal violations were found for any of the POI's studied. Appendix D includes the N-1 thermal results with a complete description of the associated contingencies.

Table 5-2 N-1 thermal results for peak load conditions for POI-1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)						
Thermal Impact - POI-1 (Beebe 115 kV)						
1	2	3	4	5	6	7
Monitored Element	Rating	Loading(%) of LTE rating	Loading(%) of LTE rating	(4)-(3)		
** From bus ** ** To bus ** CKT	MVA	Without Project	With Project	Impact (%)	Prior Outage	Contingency
70117 LIVERMOR 115.00 70152 RILEY 115.00 1	226.1	99	99	0.04	Intact	L210211
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	99.5	99.8	0.29	Intact	N-214
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	96.4	96.8	0.38	Intact	F-206
72722 GREGGS 115.00 72755 RIMMON 115.00 1	175	96.1	96.1	0.01	Intact	MRMK_SB_12

Table 5-3 N-1 thermal results for peak load conditions for POI-2

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)						
Thermal Impact - POI-2 (Tapped E115 line)						
1	2	3	4	5	6	7
Monitored Element	Rating	Loading(%) of LTE rating	Loading(%) of LTE rating	(4)-(3)		
** From bus ** ** To bus ** CKT	MVA	Without Project	With Project	Impact (%)	Prior Outage	Contingency
70117 LIVERMOR 115.00 70152 RILEY 115.00 1	226.1	99	99	0.03	Intact	L210211
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	99.5	99.7	0.18	Intact	N-214
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	96.4	96.7	0.24	Intact	F-206
72722 GREGGS 115.00 72755 RIMMON 115.00 1	175	96.1	96.1	0.01	Intact	MRMK_SB_12

Table 5-4 N-1 thermal results for shoulder load conditions for POI-2

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)						
Thermal Impact - POI-2 (Tapped E115 line)						
1	2	3	4	5	6	7
Monitored Element	Rating	Loading(%) of LTE rating	Loading(%) of LTE rating	(4)-(3)		
** From bus ** ** To bus ** CKT	MVA	Without Project	With Project	Impact (%)	Prior Outage	Contingency
72749 WEBSTER 115.00 72759 PEMI 115.00 1	140	99	99.1	0.1	Intact	X178-U199
72749 WEBSTER 115.00 72759 PEMI 115.00 1	140	99	99.1	0.1	Intact	LIT_SB_6099A
72749 WEBSTER 115.00 72759 PEMI 115.00 1	140	98.8	98.9	0.1	Intact	WHTFLD_178SB

Table 5-5 N-1 thermal results for light load conditions for POI-1

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)						
Thermal Impact - POI-1 (Beebe 115 kV)						
1	2	3	4	5	6	7
Monitored Element	Rating	Loading(%) of LTE rating	Loading(%) of LTE rating	(4)-(3)		
** From bus ** ** To bus ** CKT	MVA	Without Project	With Project	Impact (%)	Prior Outage	Contingency
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	92.1	98.3	6.2	Intact	PEMI_SB
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	91.9	98.2	6.34	Intact	E115
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	93.6	96.3	2.64	Intact	PEMI_SB_1110

Table 5-6 N-1 thermal results for light load conditions for POI-2

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)						
Thermal Impact - POI-2 (Tapped E115 line)						
1	2	3	4	5	6	7
Monitored Element	Rating	Loading(%) of LTE rating	Loading(%) of LTE rating	(4)-(3)		
** From bus ** ** To bus ** CKT	MVA	Without Project	With Project	Impact (%)	Prior Outage	Contingency
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	92.1	98.3	6.21	Intact	E1150-SB-2
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1			98.2		Intact	E115-S
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	93.6	96.3	2.66	Intact	PEMI_SB_1110

5.3 N-1 Voltage Results

For the N-1 voltage analysis the higher queued project Q305 Wind interconnecting at Pemigewasset was modeled without any capacitor banks that may be required by project Q305. Possible capacitor banks that could be required by Q305 had not been determined at the time the analysis documented in this section was performed.

A number of low voltage and high voltage violations were identified in the cases with the Project in service for both interconnection options; all high voltage violations can be eliminated by re-dispatching existing capacitors at Beebe River and White Lake substations. Tables 5-7 to 5-11 below summarize the N-1 voltage results and show the worst voltage violations at each bus. Appendix D includes the complete voltage results with detailed descriptions of the associated contingencies.

For peak and shoulder load conditions, the capacitor banks at Beebe River and White Lake were dispatched pre-contingency at full output, 43.4 Mvar and 21.6 Mvar, respectively. For light load conditions the capacitor banks at the same locations were dispatched at reduced output, 28.8 Mvar and 7.2 Mvar respectively. The pre-contingency capacitor dispatch was determined automatically by the power flow solution to maintain the respective voltage schedules of those capacitor banks. During contingency conditions the capacitor banks were locked at their pre-contingency dispatch.

The N-1 voltage results are summarized as follows,

5.3.1 Interconnection at Beebe River Substation (POI -1)

Tables 5-7 to 5-9 show the voltage results for POI-1 for the three loading conditions analyzed. The results are discussed below.

During peak load conditions, post-Project low voltages were found at the following 115 kV buses during the contingencies indicated:

- Interval, Saco Valley, Saco PAR and Saco PAR2 during the loss of the 214 line (Lovell-Saco Valley 115 kV). Low voltages do not occur in the pre-Project case.
- Ashland, Ashland Tap and Pemigewasset during the Webster 115 kV stuck breaker contingency “WEBS_SB_2” that results in the loss of the second Webster bus and all adjacent lines. Low voltages do not occur in the pre-Project case.
- Webster, Laconia 1 and Laconia 2 during the Webster 115 kV stuck breaker contingency “WEBS_SB_2” described above. Similar low voltages also occur in the pre-Project case and therefore these violations are considered pre-existing.

During shoulder load conditions, post-Project high voltages were found at the following 115 kV buses during the contingencies indicated:

- Beebe River, during the loss of the B112 line (Beebe River-Tamworth tap-White Lake 115 kV). The high voltage can be eliminated by reducing capacitors at Beebe from 43.2 Mvar to 28.8 Mvar post-contingency.

- Q345 115 kV collector bus, during the Saco Valley stuck breaker contingency. For the same contingency, high voltages appear at Beebe River, Woodstock, Tamworth and White Lake; these high voltages are not shown in the results because they also appear pre-Project and the violations are less severe with the Project in service. All high voltages can be eliminated by reducing capacitors at Beebe from 43.2 Mvar to 0 Mvar post-contingency.

During light load conditions, post Project high voltages were found at Woodstock during the 214 contingencies; the high voltage does not occur pre-Project. For the same contingency high voltages occur at Beebe River, Tamworth and White Like that exist without the Project; these high voltages do not appear in the tables because they are less severe with the Project in service. All high voltage violations can be addressed by reducing the capacitor dispatch at Beebe River post-contingency from 28.8 Mvar to 14.4 Mvar.

Table 5-7 N-1 voltage violations for peak load conditions for POI-1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)								
Voltage Impact - POI-1 (Beebe 115 kV)								
1		2	3	4	5	6	7	8
Monitored Element		Without	Project	With	Project	(4)-(2)		
Bus		Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72706 SACO_PAR	115.00	0.9718	0.9841	0.9376	0.9757	-0.034	Intact	214
72707 SAC_PAR2	115.00	0.9764	0.9964	0.9426	0.9871	-0.034	Intact	214
72708 LACONIA2	115.00	0.8804	0.9712	0.8711	0.9676	-0.009	Intact	WEBS_SB_2
72711 ASH TAP	115.00	0.962	0.9992	0.9493	0.989	-0.013	Intact	WEBS_SB_2
72728 LACONIA1	115.00	0.7839	0.971	0.7709	0.9675	-0.013	Intact	WEBS_SB_2
72749 WEBSTER	115.00	0.9206	0.9794	0.9127	0.976	-0.008	Intact	WEBS_SB_2
72759 PEMI	115.00	0.951	0.9941	0.9395	0.9865	-0.011	Intact	WEBS_SB_2
72761 SACO VLY	115.00	0.9692	0.9784	0.9348	0.9707	-0.034	Intact	214
72767 ASHLAND	115.00	0.9615	0.9988	0.9486	0.9883	-0.013	Intact	WEBS_SB_2
72849 INTERVAL	115.00	0.9684	0.9775	0.9339	0.9698	-0.034	Intact	214

Table 5-8 N-1 voltage violations for shoulder load conditions for POI-1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)								
Voltage Impact - POI-1 (Beebe 115 kV)								
1		2	3	4	5	6	7	8
Monitored Element		Without	Project	With	Project	(4)-(2)		
Bus		Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72712 BEEBE	115.00	1.0453	1.0262	1.0528	1.0337	0.007	Intact	B-112
94000 Q345 COL	115.00			1.0699	1.0331		Intact	SACOVAL_SB

Table 5-9 N-1 voltage violations for light load conditions for POI-1

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)							
Voltage Impact - POI-1 (Beebe 115 kV)							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72753 WOODSTKH 115.00	1.0436	1.0241	1.0505	1.0314	0.007	Intact	214
94000 Q345 COL 115.00			1.061	1.0279		Intact	SACOVAL_SB

5.3.2 Interconnection at new Substation on E115 Line (POI -2)

Tables 5-10 and 5-11 show the voltage results for POI-2 and for peak and light loading conditions. No voltage impact was observed for shoulder load conditions. The results are discussed below.

POI – 2

During peak load conditions post-Project low voltages were found at the following 115 kV buses during the contingencies indicated:

- Interval, Saco Valley, Saco PAR and Saco PAR2 during the loss of the 214 line (Lovell-Saco Valley 115 kV). The low voltages are similar to the voltages found for POI-1. Low voltages do not occur in the pre-Project case.

- Pemigewasset, during the Webster 115 kV stuck breaker contingency “WEBS_SB_2” described above. Low voltages do not occur in the pre-Project case. No violations were found at Ashland and Ashland tap.

- Laconia 1, during the Webster 115 kV stuck breaker contingency “WEBS_SB_2” described above. As for POI-1, similar low voltages also occur at Laconia 2 and Webster for the same contingency but are not shown in the results. Similar low voltages also occur in the pre-Project case and therefore these violations are considered pre-existing.

Also during peak load conditions, post-Project high voltages were found at the following 115 kV buses during the contingencies indicated:

- Beebe River, during the loss of the E115-North (Q345 POI – Beebe River 115 kV)

- Q345 POI and Q345 collector bus, during the loss of E115-South (Q345 POI – Ashland Tap – Pemigewasset 115 kV)

The violations above do not exist pre-Project because the contingencies involved do not exist pre-Project. The high voltages can be eliminated by reducing the capacitor dispatch post-contingency at Beebe from 43.2 Mvar to 28.8 Mvar.

During light load conditions, post-Project high voltages were found at the following 115 kV buses during the contingencies indicated:

- Beebe River, during the loss of the B112 line (Beebe River-Tamworth tap-White Lake 115 kV). The high voltage can be eliminated by reducing capacitors at Beebe from 28.8 Mvar to 14.4 Mvar post-contingency.

- Q345 POI and the Q345 collector bus during the Saco Valley stuck breaker contingency. During the same contingency, high voltages also occur at Beebe River, Tamworth and White Lakes which are not shown in the tables because these high voltages also occur without the Project and are less severe with the Project in service. All voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River from 28.8 Mvar to 14.4 Mvar and at White Lake from 7.2 Mvar to 0 Mvar. The capacitor re-dispatch should be performed post-contingency by automatic control.

Table 5-10 N-1 voltage violations for peak load conditions for POI-2

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)								
Voltage Impact - POI-2 (Tapped E115 line)								
1		2	3	4	5	6	7	8
Monitored Element		Without	Project	With	Project	(4)-(2)		
Bus		Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72706 SACO_PAR	115.00	0.9718	0.9841	0.9389	0.9775	-0.033	Intact	214
72707 SAC_PAR2	115.00	0.9764	0.9964	0.9439	0.989	-0.033	Intact	214
72712 BEEBE	115.00			1.0559	1.0098		Intact	E115-N
72728 LACONIA1	115.00	0.7839	0.971	0.776	0.9683	-0.008	Intact	WEBS_SB_2
72759 PEMI	115.00	0.951	0.9941	0.944	0.9884	-0.007	Intact	WEBS_SB_2
72761 SACO VLY	115.00	0.9692	0.9784	0.9361	0.9723	-0.033	Intact	214
72849 INTERVAL	115.00	0.9684	0.9775	0.9352	0.9714	-0.033	Intact	214
94000 Q345 COL	115.00			1.0514	1.0042		Intact	E115-S
94001 Q345 POI	115.00			1.052	1.0046		Intact	E115-S

Table 5-11 N-1 voltage violations for light load conditions for POI-2

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)								
Voltage Impact - POI-2 (Tapped E115 line)								
1		2	3	4	5	6	7	8
Monitored Element		Without	Project	With	Project	(4)-(2)		
Bus		Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72712 BEEBE	115.00	1.0485	1.0183	1.0565	1.0313	0.008	Intact	B-112
94000 Q345 COL	115.00			1.0594	1.0274		Intact	SACOVAL_SB
94001 Q345 POI	115.00			1.0601	1.0279		Intact	SACOVAL_SB

5.4 Conclusion of N-1 Analysis

The results of the thermal and voltage analyses performed show that:

- The Project does not cause a thermal adverse impact on the system for either POI.
- High voltage violations were observed with the Project in service. High voltage violations can be eliminated by re-dispatching existing capacitor banks at Beebe River and White Lake substations.
- Low voltage violations with the Project in service were observed. The low voltages need to be addressed with capacitor banks.

Section

6

Sensitivity Voltage Study

As documented in the previous section, the higher queued project Q305 interconnecting at Pemigewasset Substation was modeled without any capacitors required by that project; information on those capacitors was unavailable at the time the initial part of the study was performed. Current results from the Q305 steady state study shows that 21.6 Mvar capacitor banks are required. Therefore, a sensitivity study was performed to find the impact, if any, of the Q305 capacitor banks on the Q345 Project voltage results. For the sensitivity study the most updated power flow model was used to represent project Q305.

6.1 N-1 Voltage Sensitivity Results

Table 6-1 below shows the pre-contingency capacitor dispatch at Beebe River, White Lake and project Q305 substations with and without the Q345 Project. The capacitor dispatch was determined by the power flow solution to maintain the respective voltage schedules. During contingency conditions the capacitor banks were locked at their pre-contingency dispatches.

Table 6-1 Pre-contingency Capacitor Dispatch (Mvar)

Location	Peak Load	Shoulder Load	Light Load
Beebe River (existing)	3 x 14.4	2 x 14.4	Offline
White Lake (existing)	1 x 14.4 1 x 7.2	1 x 14.4 1 x 7.2	Offline
Q305	3 x 7.2	3 x 7.2	Offline

.

The sensitivity testing shows that with the capacitor banks at Q305, the post-contingency voltages in the system are higher that those reported in the previous section where the capacitors at Q305 were not considered. Besides, low voltage violations that in the previous analysis also occurred without the Project were considered pre-existing; those low voltage violations without the Project were eliminated by adding the capacitors at Q305 but still exist with the Project and are reported in this section.

With the capacitor banks at Q305, low voltage violations were still found in the sensitivity testing. The N-1 voltage sensitivity results are summarized below.

6.1.1 Interconnection at Beebe River Substation (POI -1)

Tables 6-1 to 6-3 show the voltage results for POI-1 for the three loading conditions analyzed. Complete results are documented in Appendix D. The results are discussed below.

During peak load conditions, post-Project low voltages were found at the following 115 kV buses during the contingencies indicated:

- Interval, Saco Valley, Saco PAR and Saco PAR2 115 kV during the loss of the 214 line (Lovell-Saco Valley 115 kV).
- Ashland, Ashland tap and Pemigewasset 115 kV for a stuck breaker contingency at Merrimack Substation

During shoulder load conditions, post-Project low voltage was found at Laconia 2 115 kV for a stuck breaker contingency at Webster Substation.

During light load conditions, no voltage violations were found.

Table 6-1 N-1 voltage violations for peak load conditions for POI-1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)								
Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps								
1		2	3	4	5	6	7	8
Monitored Element		Without	Project	With	Project	(4)-(2)		
Bus		Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72706 SACO_PAR	115.00	0.975	0.9846	0.9366	0.977	-0.039	Intact	214
72707 SAC_PAR2	115.00	0.98	0.997	0.9416	0.988	-0.038	Intact	214
72711 ASH TAP	115.00	0.961	1	0.9473	0.9886	-0.014	Intact	MRMK_SB_23
72759 PEMI	115.00	0.951	0.995	0.9378	0.9856	-0.013	Intact	MRMK_SB_23
72761 SACO VLY	115.00	0.973	0.9789	0.9338	0.9719	-0.039	Intact	214
72767 ASHLAND	115.00	0.961	0.9996	0.9465	0.9879	-0.014	Intact	MRMK_SB_23
72849 INTERVAL	115.00	0.972	0.978	0.9329	0.9711	-0.039	Intact	214

Table 6-2 N-1 voltage violations for shoulder load conditions for POI-1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72708 LACONIA2 115.00	0.958	1.0008	0.947	0.9938	-0.011	Intact	WEBS_SB_2

Table 6-3 N-1 voltage violations for light load conditions for POI-1

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)							
Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
No significant Voltage Impact							

6.1.2 Interconnection at new Substation on E115 Line (POI -2)

Tables 6-4 to 6-6 show the voltage results for POI-2 and for peak, shoulder and light load conditions, respectively. Complete results are documented in Appendix D. The results are discussed below.

POI – 2

During peak load conditions post-Project low voltages were found at the following 115 kV buses during the contingencies indicated:

- Interval, Saco Valley and Saco PAR 115 kV during the loss of the 214 line (Lovell-Saco Valley 115 kV).
- Pemigewasset 115 kV for a stuck breaker contingency at Merrimack Substation

Also during peak load conditions, post-Project high voltages were found at the following 115 kV buses during the contingencies indicated:

- Beebe River, during the loss of the E115-North (Q345 POI – Beebe River 115 kV)

- Q345 POI and Q345 collector buses, during a stuck breaker contingency at Pemigewasset.

The high voltage violations cited above do not exist pre-Project because either the contingency or the bus involved does not exist pre-Project. The high voltages can be eliminated by reducing the dispatch of the switchable capacitors at Beebe River Substation from 43.2 Mvar to 28.8 Mvar after the contingency.

During shoulder load conditions, a post-Project low voltage violation was found at the Laconia 2 115 kV bus during a stuck breaker contingency at Webster Substation.

During light load conditions, no voltage violations were found.

Table 6-4 N-1 voltage violations for peak load conditions for POI-2

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)							
Voltage Impact - POI-2 (Tapped E115 line) - with Q305 Caps							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72706 SACO_PAR 115.00	0.975	0.9846	0.9388	0.9787	-0.036	Intact	214
72707 SAC_PAR2 115.00	0.98	0.997	0.9437	0.9899	-0.036	Intact	214
72712 BEEBE 115.00			1.0571	1.0101		Intact	E115-N
72759 PEMI 115.00	0.951	0.995	0.9429	0.988	-0.008	Intact	MRMK_SB_23
72761 SACO VLY 115.00	0.973	0.9789	0.936	0.9735	-0.037	Intact	214
72849 INTERVAL 115.00	0.972	0.978	0.9351	0.9726	-0.037	Intact	214
94000 Q345 COL 115.00			1.0524	1.0044		Intact	E1150-SB-2
94001 Q345 POI 115.00			1.0531	1.0047		Intact	E1150-SB-2

Table 6-5 N-1 voltage violations for shoulder load conditions for POI-2

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Voltage Impact - POI-2 (Tapped E115 line) - with Q305 Caps							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
72708 LACONIA2 115.00	0.958	1.0008	0.9483	0.9942	-0.009	Intact	WEBS_SB_2

Table 6-6 N-1 voltage violations for light load conditions for POI-2

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)							
Voltage Impact - POI-2 (Tapped E115 line) with Q305 caps							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
No significant Voltage Impact							

6.2 Conclusion of Sensitivity Voltage Study

The results of the sensitivity analyses show that,

- Post-contingency violations still occur for both interconnection options with the Project in service considering the Q305 capacitor banks in service. Those violations do not occur without the Project.
- High voltage violations were observed with the Project in service for POI-2 which can be eliminated by re-dispatching existing switchable capacitor banks at Beebe River Substation.

6.3 Project Q345 Capacitor Banks

The post-contingency low voltages identified with the Project in service can be eliminated with 2 x 7.2 Mvar switchable capacitor banks connected to the Project 115 kV collector bus. The capacitor banks should be controlled by SCADA.

Should project Q305 drop out of the queue, additional capacitors may be required for the interconnection of Q345.

Section

7

Short Circuit Study

The short circuit study was performed by Public Service of New Hampshire (PSNH). The report is included in Appendix F.

Section

8

Cost Estimates

The cost estimate was provided by Public Service of New Hampshire (PSNH), the Transmission Owner. This is a high level good faith estimates based on the information presented to date. Detailed engineering will change the final estimates.

The cost estimates (-50% / +200%) for the two interconnection options are provided below. The estimates do not include any work for the possible 115 kV capacitor banks.

- New position at Beebe River Substation: $1,678k - $6,714k. ROW easements and construction of new transmission line are not included.

- New three-breaker 115 kV Substation: $5,787k - $23,150k. Substation land, ROW easements and construction of new transmission line are not included.

Beebe River Interconnection:

Remove existing:

- J34 Manual operated disconnect

- J70 Motor operated disconnect switch along with associated steel, foundations & wiring

Add new coombs steel bay with the following:

Two (2) - 115kV Tandem Mounted Under hung Manual Disconnect Switches (2-115kV switches on a common base, 4 switches total)

One (1) - 115kV Manual Operated Disconnect Switch

One (1) - 115kV Breaker

Three (3) - 115kV CCVT's

Three (3) - 115kV LA's

One (1) - 115kV Wave trap

One (1) - Steel riser structure

All associated steel, foundations & wiring required.
Approximately 500lf of underground conductor.

Relocate approximately 100lf of fence.

Proposed New 115 kV substation

Three (3) - 115kV Breakers
Three (3) - Takeoff Structures
Eight (8) - 115kV Manual Operated DIsconnect Switches
Three (3) - 115kV Motor Operated Disconnect Switches
Nine (9) - 115kV CCVT's
Nine (9) - 115kV LA's
Three (3) - 115kV Wave trap

All associated foundations, steel & wiring as required
Site clearing and ground work/prep for substation yard.
New control house approximately 800sf
Line & breaker fail relays & SCADA system as needed.
Protection modifications at remote substations

Project includes a line split off of the E115 line which includes:

Two (2) - Dead End wood structures.
Four (4) - Tangent wood structures.
Approximately 0.5miles of 115kV conductor with OPGW.
Associated insulators and hardware as required.

Section

9

Conclusions

The analysis was initially performed without considering the capacitor banks that may be require by the higher queued project Q305. The feasibility study results for the interconnection of the Project are summarized below:

9.1 Results for Base Case Conditions (N-0 Analysis)

No thermal or voltage violations caused by the Project were found during base case conditions.

9.2 Thermal Results for All Lines in Service (N-1 Analysis)

The study thermal results show that the Project does not have an adverse impact for any of the two interconnection options studied.

9.3 Voltage Results (N-1 Analysis)

9.3.1 POI – 1 (Interconnection at Beebe River Substation)

1) Post-contingency low voltages were found at the following 115 kV buses during peak load conditions,

- Interval, Saco Valley, Saco PAR and Saco PAR2 during the loss of the 214 line (Lovell-Saco Valley 115 kV). Low voltages do not occur without the Project.
- Pemigewasset, Ashland and Ashland tap during the Webster 115 kV stuck breaker #2 contingency. Low voltages do not occur without the Project.

2) Post-contingency high voltages were found at the following 115 kV buses for several contingencies during shoulder and light load conditions,

- Beebe River, Tamworth, White Lake and the Project 115 kV collector bus. Some of these high voltages also occur without the Project. All high voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River and White Lake post-contingency.

9.3.2 POI – 2 (Interconnection at New 3-Breaker Substation on E115 Line)

1) Post-contingency low voltages were found at the following 115 kV buses during peak load conditions,

- Interval, Saco Valley, Saco PAR and Saco PAR2 during the loss of the 214 line (Lovell-Saco Valley 115 kV). Low voltages do not occur without the Project.
- Pemigewasset during the Webster 115 kV stuck breaker #2 contingency. Low voltages do not occur without the Project.

2) Post-contingency high voltages were found at the following 115 kV buses for several contingencies during peak, shoulder and light load conditions,

- Beebe River, Tamworth, White Lake, the Project POI-2 and Project 115 kV collector buses. Some of these high voltages also occur without the Project. All high voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River and White Lake post-contingency.

9.4 Sensitivity Voltage Analysis with Q305 Capacitors

Voltage testing was performed with 3 x 7.2 Mvar capacitors required by project Q305 which interconnects at Pemigewasset Substation.

The sensitivity testing still show low voltage violations for both interconnection options, although those voltages are higher than those identified in the main study without capacitors at project Q305. High voltage violations were also identified; the high voltage violations can be eliminated by reducing the capacitor dispatch at Beebe River Substation.

It was verified that 2 x 7.2 Mvar capacitor banks installed at the Project 115 kV collector bus will eliminate all low voltage violations for both interconnection options. Should project Q305 drop out of the queue, additional capacitors may be required for the interconnection of Q345.

9.5 Short Circuit Analysis

The addition of the 48MW wind powered facility for either proposed connection will not cause any PSNH Transmission breakers to become overdutied or exceed 80% of their current rating. For all breaker rating studies, a pre-fault voltage of 1.05pu is used.

9.6 Cost Estimates

The cost estimates (-50% / +200%) for the two interconnection options are provided below. The estimates do not include any work for the possible 115 kV capacitor banks.

- New position at Beebe River Substation: $1,678k - $6,714k. ROW easements and construction of new transmission line are not included.
- New three-breaker 115 kV Substation: $5,787k - $23,150k. Substation land, ROW easements and construction of new transmission line are not included.

Appendix

A

Power Flow Summaries

2007 SERIES, NERC/MMWG BASE CASE LIBRARY
2013 SUMMER PEAK - Q345 - PRE-PROJECT

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.974	667	150*	73072	ALT12 PF	1.024	65	14*	73073	ALT34 PF	1.022	81	14
72986	BERKPWR	1.035	305	53	73069	MAPR1 PF	1.014	96	23	73070	MAPR2 PF	1.015	96	23
73071	MAPR3 PF	1.011	90	23	73085	MT.TOM	1.007	146	20	72512	BRSWP G1	1.019	294	78
72513	BRSWP G2	1.021	231	78	73083	NRTHFD3	1.012	270	80*	73033	NRTHFLD1	1.012	270	80*
73034	NRTHFLD2	1.016	270	80*	73084	NRTHFD4	1.012	270	80*	72930	STNYBK1A	1.041	65	26
72931	STNYBK1B	1.041	65	26	72932	STNYBK1C	1.041	65	26	72933	STNYBK 1	1.041	87	29
72934	STNYBK2A	1.041	65	26	72935	STNYBK2B	1.041	65	26	73080	WSPFLD 3	0.996	107	6
72244	MILLENST	1.012	117	28	72243	MILLENCT	1.015	273	63	70479	SHFLDWND	0.996	30	0*
70480	SHFDWND2	0.993	10	0*	70644	VPPSA	1.030	48	2	70712	ESSEX 19	1.023	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	1.013	940	372*	73563	MILL#3	1.015	1260	497*	73558	MONTV#5	0.995	81	15
73559	MONTV#6	1.002	402	77	73555	MIDDTN#2	1.001	117	23	73556	MIDDTN#3	0.982	233	23
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	1.032	280	116	73566	LAKERD#2	1.031	305	116
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	1.046	93	4*	73550	SMD1314J	1.046	93	4*
73594	WALL LV1	1.017	102	10	73595	WALL LV2	1.017	102	10	73596	WALL LV3	1.017	51	7
73538	AESTH PF	1.006	180	34	73652	BE 11	1.023	104	54	73653	BE 12	1.017	170	54
73654	BE 10 ST	1.019	180	54	73647	BPTHBR#2	0.000	0	0	73648	BPTHBR#3	0.976	375	54
73570	DEVGAS11	1.071	42	30*	73571	DEVGAS12	1.090	42	30*	73572	DEVGAS13	1.091	42	30*
73573	DEVGAS14	1.072	42	30*	73553	DEVON#7	1.026	107	47*	73554	DEVON#8	0.000	0	0
73574	MILFD#1	1.017	280	47	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.993	447	175*
73551	NORHAR#1	1.001	162	35	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.008	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.107	179	79	70061	MIS GT2	1.107	179	79	70062	MIS ST	1.106	191	78
70377	AEC G1	1.102	55	31	70378	AEC G2	1.103	55	31	70379	AEC G3	1.102	55	31
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.963	15	6*	70424	CHAMP G3	0.000	0	0
70425	NEWPCOGN	1.021	110	33*	70381	RPA CG1	1.063	179	77	70382	RPA SG2	1.068	93	42
70422	WARRN G1	1.065	51	15*	70423	WARRN G2	1.085	45	11*	70386	WBK G1	1.036	185	71
70387	WBK G2	1.036	185	71	70388	WBK G3	1.037	196	73	70365	WF WY #1	1.008	50	8
70366	WF WY #2	1.008	50	8	70367	WF WY #3	1.008	95	15	70368	WF WY #4	1.032	636	188
71857	COMRF G1	1.021	24	4	71858	COMRF G2	1.018	48	4	71859	COMRF G3	1.018	48	4
71860	COMRF G4	1.018	48	4	71861	MOORE G1	1.009	48	3	71862	MOORE G2	1.019	48	3
71863	MOORE G3	1.004	48	3	71864	MOORE G4	1.015	48	3	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.029	169	105*	72703	CONEDG2	1.029	169	105*	72704	CONEDG3	1.029	195	119
71950	GRANRDG1	1.059	280	66	71951	GRANRDG2	1.050	280	97	72701	AESSTG	1.035	264	40
72760	POTOK PH	0.000	0	0	72866	MERMK G1	1.000	113	0	72867	MERMK G2	0.998	356	-1
72869	SBRK G1	1.006	1318	375*	72870	SCHILLER	0.976	48	11	72872	SCHILLER	0.976	48	11
72871	SCHILLER	0.976	50	11	72918	L NATION	0.000	0	0	90020	Q166-DIX	0.000	0	0
90030	Q166-OWL	1.050	18	3	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	1.030	15	0*	72742	TAMWORTH	1.010	20	0*	72758	SMITH HY	0.000	0	0*
72812	JACKMAN	1.019	13	0*	72820	NORTH 34	1.029	14	0*	72835	LACONIA	1.004	3	0*
72837	WEBSTER	1.014	6	0*	72840	AYERS	1.035	9	0*	72845	BERLIN	1.011	14	0*
72873	WL JET	1.007	18	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	17	-1
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	0.000	0	0	70233	SPRUCEG1	1.012	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	1.043	30	0*
70084	LFCOLL2	1.037	20	0*	88001	Q305-01-	1.050	18	3	88010	Q305-10-	1.050	16	3
88018	Q305-18-	1.050	16	3	88026	Q305-26-	1.050	16	3	70449	OAK HILL	1.024	26	0*
91870	AMPRSND	1.013	13	-4	9568	S01_GEN	1.034	3	0*	9569	S02_GEN	1.034	3	0*
9570	S03_GEN	1.033	3	0*	9571	S04_GEN	1.033	3	0*	9572	S05_GEN	1.033	3	0*
9573	S06_GEN	1.034	3	0*	9574	S07_GEN	1.035	3	0*	9575	S08_GEN	1.034	3	0*
9576	S09_GEN	1.034	3	0*	9577	S10_GEN	1.034	3	0*	9578	S11_GEN	1.034	3	0*
9579	S12_GEN	1.034	3	0*	9921	T01_GEN	1.042	3	0*	9922	T02_GEN	1.043	3	0*
9923	T03_GEN	1.045	3	0*	9924	T04_GEN	1.045	3	0*	9925	T05_GEN	1.045	3	0*
9926	T06_GEN	1.046	3	0*	9927	T07_GEN	1.046	3	0*	155	CPD WINC	1.027	18	-3*
94030		0.000	0	0*	94040		0.000	0	0*	94050		0.000	0	0*
94060		0.000	0	0*	94070		0.000	0	0*	94080		0.000	0	0*
94090		0.000	0	0*	94100		0.000	0	0*	94110		0.000	0	0*
94120		0.000	0	0*	94130		0.000	0	0*	94140		0.000	0	0*
94155		0.000	0	0*	94165		0.000	0	0*	94165		0.000	0	0*
94175		0.000	0	0*	94190		0.000	0	0*	94200		0.000	0	0*
94210		0.000	0	0*	94220		0.000	0	0*	94230		0.000	0	0*
94240		0.000	0	0*	94250		0.000	0	0*	94265		0.000	0	0*
94275		0.000	0	0*										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0*	71067	MYS8 GTS	1.038	495	128	71068	MYS8 ST	1.062	290	128
71069	MYS9 GTS	1.039	460	169	71070	MYS9 ST	1.076	290	183	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	1.024	565	128
71947 SALEM G2	1.025	78	12	71948 SALEM G3	1.021	143	24	71949 SALEM G4	1.022	360	72
72059 LENERG1	1.040	65	17	72060 LENERG2	1.033	20	7	71946 SALEM G1	1.025	81	12
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71095 ANPBLCK1	1.080	335	117	71096 ANPBLCK2	1.080	335	117	72377 BELL #1	0.000	0	0
72378 BELL #2	0.000	0	0	72372 BP #1 GN	0.000	0	0	72375 BP #2 GN	0.000	0	0
72370 BP #3 GN	1.026	430	112	72371 BP #4 GN	1.031	425	84	71531 OSP1 PF	1.032	77	18
71532 OSP2 PF	1.032	77	18	71533 OSP3 PF	1.032	108	24	71534 OSP4 PF	1.032	77	18
71535 OSP5 PF	1.032	77	18	71536 OSP6 PF	1.032	108	24	71084 NEA GTPF	1.049	110	40*
71085 NEA GTPF	1.049	110	40*	71086 NEA STPF	1.066	80	55*	72666 FRSQ SC1	0.991	46	3
72667 FRSQ SC2	0.991	46	-2	72668 FRSQ SC3	0.991	46	-4	72661 MANCH09A	1.014	115	35*
72662 MANCH10A	1.014	115	35*	72663 MANCH11A	1.014	115	35*	72671 RISEG1CT	1.047	176	74
72672 RISEG3ST	1.045	196	74	72673 RISEG2CT	1.047	176	74	72373 MPLP 1PF	0.000	0	0
72374 MPLP 2PF	0.000	0	0	71251 CANAL G1	1.043	566	239	71252 CANAL G2	1.017	576	100*
71094 PLGRM G1	1.029	670	80	71092 EDG ST	1.008	311	-2	71093 EDG GTS	1.009	507	-2
71522 SOM G6	0.944	105	3	72669 TIVER G1	0.985	189	-8	72670 TIVER G2	0.990	92	-4
71524 DGHTNPWR	0.996	185	30*								

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	869	BRPT-ENERGY	454	163	MIDDLETOWN	350	46
MONTVILLE	483	92	NORWALK	162	35	BPTHBR	397	56
NHHARBOUR	447	175	DEVON	107	47	MERIDEN	0	0
WALLINGFORD	255	28	BERKSHIRE	305	53	LAKEROAD	585	232
STONYBROOK	412	159	MILLENNIUM	390	91	BRAYTONPT	855	197
HOPE	548	221	FRSQ	484	101	SOMERSET	105	3
OSP	524	120	NEA	299	135	CANAL	1142	339
PILGRIM	670	80	MASSPWRR	282	68	ANP-BELLINGHAM	0	0
ANP-BLACKSTONE	669	234	EMI-TIVERTON	281	-12	EMI-DIGHTON	185	30
SITHE-EDGAR	818	-4	MYSTIC	565	128	NEWBOSTON	0	0
SALEMHBR	662	120	SITHE-MYSTIC	1535	609	SEABROOK	1318	375
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	146	33
MERRIMACK	469	-1	WYMAN	831	219	VTYANKEE	667	150
BEARSWAMP	525	157	NORTHFIELD	1080	320	ALTRESCO	146	27
MIS	549	235	AEC	164	93	RPA	272	119
WESTBROOK	565	214	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0	NY	333	288			

INTERFACE FLOWS

NB-NE	1000	-180	ORRING-SOUTH	1227	176	SUROWIEC-SOUTH	910	-39
MEYANKEE-SOUTH	875	-141	MAINE-NH	1692	-17	NNE-SCOBIE+394	2743	288
SEABROOK-SOUTH	1492	243	NORTH-SOUTH	2737	-65	CMFD/MOORE-SO	287	56
SNDYPOND-SOUTH	2445	-299	CONN-IMPORT	1975	199	SWCT	2025	157
NE-NRWLK-STFD	1460	66	BOSTON IMPORT	2948	-620	SEMA/RI EXPORT	1882	-24
SEMA EXPORT	519	-394	EAST-WEST	2135	117	NY-NE 2200(170	-1223	179
NW VT	294	-24	PV20 PAR	99	-7<-2	BLISS PAR	-1	-1
CROSS-SOUND	-346	130	LILCO	4	-49	214	143	1
F206	188	47						

HVDC TRANSFERS FROM H-Q

PHII-P1 = 1000

HIGHGATE = 211
PHII-P2 = 1000

BUS VOLTAGES

	V	LMT			V	LMT			V	LMT	
70001 CHESTER	357.			72692 NWGTN345	357.			72694 SEBRK345	355.		
71789 TEWKS	355.			70759 MYSTIC	360.			71797 MILLBURY	352.		
72925 LUDLOW	347.			72926 NRTHFLD	352.			73106 SOUTHGTN	337.		
73108 CARD	352.			73109 MONTVILE	351.			73110 MILLSTNE	355.		
73116 MIDDLTWN	345.			71801 BRAYTN P	358.			71811 KENT CO.	352.		
71326 BRIDGWTR	355.			71336 SHERMAN	357.			71338 OS POWER	357.		
71337 WFARNUM	355.			70772 W MEDWAY	355.			70780 WWALP345	356.		
70783 PILGRIM	358.			70773 NEA 336	358.			71193 CANAL	359.		
71133 CARVER	357.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	237.		
70793 MDFRM230	240.			70794 MDWLT230	240.			70818 MYSTC MA	119.		
71891 SALEM HR	119.			72096 MILLBURY	114.		0.0	71377 SOMERSET	116.		
72277 MIDWEYMT	117.			72259 MINK 183	118.			72574 WARRN 84	115.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	114.			71379 SWANSEA	116.			72269 WITNPD43	114.		
72278 FIELD 1	117.			72266 READ ST	115.			72267 S WREN29	110.		
72254 DEPOT129	112.			72255 DEPOT130	112.			72582 WOONSCKT	117.		
71403 WFARNUM	117.			72579 WOLF 171	118.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	116.		12.6
72565 KENT CO	116.		75.6 *	72570 SOCK187	115.			72571 SOCK188	115.		
72557 DAVIST85	116.			72559 DAVIS 90	115.			72572 W.KINGST	116.		37.8 *
72538 KENYON	116.			72581 WOOD RIV	116.			70512 ESX B-2	116.		
70487 COOL 345	354.			70520 W RUTLND	117.			73281 EXETR PF	116.		
90000 Q166-POI	117.			72760 POTOK PH	117.			72731 LOST NAT	117.		
72752 WHITEFLD	117.			71838 MOORE	119.			72713 BERLIN	116.		
72729 LITTLTN	119.			72753 WOODSTKH	117.			70496 GRAN 230	232.		
91000 Q229_LINK	116.			72759 PEMI	114.			72712 BEEBE	117.		
94001 Q345 115 2	0.	*E									

AREA/ZONE TOTALS

ISO-NE_GEN	28844	ISO-NE_LOAD	29972	ISO-NE_LOSS	875	
ISO-NE_INT	-2010					
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2007 SERIES, NERC/MMWG BASE CASE LIBRARY
2013 SUMMER PEAK - Q345 - POST-PROJECT POI-1

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.974	667	150*	73072	ALT12 PF	1.024	65	14*	73073	ALT34 PF	1.023	81	14
72986	BERKPWR	1.035	305	53	73069	MAPR1 PF	1.014	96	23	73070	MAPR2 PF	1.015	96	23
73071	MAPR3 PF	1.011	90	23	73085	MT.TOM	1.007	146	20	72512	BRSWP G1	1.019	294	78
72513	BRSWP G2	1.021	231	78	73083	NRTHFD3	1.012	270	80*	73033	NRTHFLD1	1.012	270	80*
73034	NRTHFLD2	1.016	270	80*	73084	NRTHFD4	1.012	270	80*	72930	STNYBK1A	1.041	65	26
72931	STNYBK1B	1.041	65	26	72932	STNYBK1C	1.041	65	26	72933	STNYBK 1	1.041	87	29
72934	STNYBK2A	1.041	65	26	72935	STNYBK2B	1.041	65	26	73080	WSPFLD 3	0.996	107	6
72244	MILLENST	1.012	117	28	72243	MILLENCT	1.015	273	63	70479	SHFLDWND	0.995	30	0*
70480	SHFDWND2	0.992	10	0*	70644	VPPSA	1.030	48	2	70712	ESSEX 19	1.023	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	1.013	940	372*	73563	MILL#3	1.015	1260	497*	73558	MONTV#5	0.995	81	15
73559	MONTV#6	1.002	402	77	73555	MIDDTN#2	1.001	117	23	73556	MIDDTN#3	0.982	233	23
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	1.032	280	116	73566	LAKERD#2	1.031	305	116
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	1.046	93	4*	73550	SMD1314J	1.046	93	4*
73594	WALL LV1	1.017	102	10	73595	WALL LV2	1.017	102	10	73596	WALL LV3	1.017	51	7
73538	AESTH PF	1.006	180	34	73652	BE 11	1.023	104	54	73653	BE 12	1.017	170	54
73654	BE 10 ST	1.019	180	54	73647	BPTHBR#2	0.000	0	0	73648	BPTHBR#3	0.976	375	54
73570	DEVGAS11	1.071	42	30*	73571	DEVGAS12	1.090	42	30*	73572	DEVGAS13	1.091	42	30*
73573	DEVGAS14	1.072	42	30*	73553	DEVON#7	1.026	107	47*	73554	DEVON#8	0.000	0	0
73574	MILFD#1	1.017	280	47	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.993	447	175*
73551	NORHAR#1	1.001	162	35	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.008	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.107	179	79	70061	MIS GT2	1.107	179	79	70062	MIS ST	1.106	191	78
70377	AEC G1	1.102	55	31	70378	AEC G2	1.103	55	31	70379	AEC G3	1.102	55	31
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.963	15	6*	70424	CHAMP G3	0.000	0	0
70425	NEWPCOGN	1.021	110	33*	70381	RPA CG1	1.064	179	79	70382	RPA SG2	1.069	93	42
70422	WARRN G1	1.065	51	15*	70423	WARRN G2	1.085	45	11*	70386	WBK G1	1.037	185	71
70387	WBK G2	1.037	185	71	70388	WBK G3	1.037	196	73	70365	WF WY #1	1.008	50	8
70366	WF WY #2	1.008	50	8	70367	WF WY #3	1.008	95	15	70368	WF WY #4	1.032	636	188
71857	COMRF G1	1.022	24	4	71858	COMRF G2	1.019	48	4	71859	COMRF G3	1.019	48	4
71860	COMRF G4	1.019	48	4	71861	MOORE G1	1.009	48	4	71862	MOORE G2	1.019	48	4
71863	MOORE G3	1.004	48	4	71864	MOORE G4	1.015	48	4	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.029	169	105*	72703	CONEDG2	1.029	169	105*	72704	CONEDG3	1.029	195	119
71950	GRANRDG1	1.059	280	66	71951	GRANRDG2	1.050	280	97	72701	AESSTG	1.035	264	40
72760	POTOK PH	0.000	0	0	72866	MERMK G1	1.001	113	1	72867	MERMK G2	0.999	356	3
72869	SBRK G1	1.006	1318	375*	72870	SCHILLER	0.976	48	11	72872	SCHILLER	0.976	48	11
72871	SCHILLER	0.976	50	11	72918	L NATION	0.000	0	0	90020	Q166-DIX	0.000	0	0
90030	Q166-OWL	1.050	18	3	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	0.000	0	0	72742	TAMWORTH	0.000	0	0	72758	SMITH HY	0.000	0	0
72812	JACKMAN	1.019	13	0*	72820	NORTH 34	1.027	14	0*	72835	LACONIA	1.005	3	0*
72837	WEBSTER	1.011	6	0*	72840	AYERS	1.032	9	0*	72845	BERLIN	1.009	14	0*
72873	WL JET	1.000	18	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	4	0
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	0.000	0	0	70233	SPRUCEG1	1.011	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	1.043	30	0*
70084	LFCOLL2	1.037	20	0*	88001	Q305-01-	1.050	18	4	88010	Q305-10-	1.050	16	3
88018	Q305-18-	1.050	16	4	88026	Q305-26-	1.050	16	4	70449	OAK HILL	1.022	26	0*
91870	AMPRSND	1.013	13	-4	9568	S01_GEN	1.034	3	0*	9569	S02_GEN	1.034	3	0*
9570	S03_GEN	1.033	3	0*	9571	S04_GEN	1.033	3	0*	9572	S05_GEN	1.033	3	0*
9573	S06_GEN	1.034	3	0*	9574	S07_GEN	1.035	3	0*	9575	S08_GEN	1.034	3	0*
9576	S09_GEN	1.034	3	0*	9577	S10_GEN	1.034	3	0*	9578	S11_GEN	1.034	3	0*
9579	S12_GEN	1.034	3	0*	9921	T01_GEN	1.042	3	0*	9922	T02_GEN	1.043	3	0*
9923	T03_GEN	1.045	3	0*	9924	T04_GEN	1.045	3	0*	9925	T05_GEN	1.045	3	0*
9926	T06_GEN	1.046	3	0*	9927	T07_GEN	1.046	3	0*	155	CPD WINC	1.027	18	-3*
94030	WTG-N6	1.050	2	0	94040	WTG-N1	1.050	2	0	94050	WTG-N2	1.050	2	0
94060	WTG-N3	1.050	2	0	94070	WTG-N4	1.050	2	0	94080	WTG-N5	1.050	2	0
94090	WTG-W1	1.050	2	0	94100	WTG-W2	1.050	2	0	94110	WTG-W3	1.050	2	0
94120	WTG-W4	1.050	2	0	94130	WTG-W5	1.050	2	0	94140	WTG-W6	1.050	2	0
94155	WTG-E2	1.050	2	0	94165	WTG-E3	1.050	2	0	94165	WTG-E3	1.050	2	0
94175	WTG-E6	1.050	2	0	94190	WTG-E5	1.050	2	0	94200	WTG-E4	1.050	2	0
94210	WTG-E7	1.050	2	0	94220	WTG-E8	1.050	2	0	94230	WTG-E9	1.050	2	0
94240	WTG-E10	1.050	2	0	94250	WTG-E11	1.050	2	0	94265	WTG-E12	1.050	2	0
94275	WTG-E13	1.050	2	0										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0	71067	MYS8 GTS	1.038	495	128	71068	MYS8 ST	1.062	290	128
71069	MYS9 GTS	1.039	460	169	71070	MYS9 ST	1.076	290	183	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	1.024	565	128
71947 SALEM G2	1.025	78	12	71948 SALEM G3	1.021	143	24	71949 SALEM G4	1.022	360	72
72059 LENERG1	1.040	65	17	72060 LENERG2	1.033	20	7	71946 SALEM G1	1.025	81	12
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71095	ANPBLCK1	1.080	335	117	71096	ANPBLCK2	1.080	335	117	72377	BELL #1	0.000	0	0
72378	BELL #2	0.000	0	0	72372	BP #1 GN	0.000	0	0	72375	BP #2 GN	0.000	0	0
72370	BP #3 GN	1.026	434	113	72371	BP #4 GN	1.031	425	84	71531	OSP1 PF	1.032	77	18
71532	OSP2 PF	1.032	77	18	71533	OSP3 PF	1.032	108	24	71534	OSP4 PF	1.032	77	18
71535	OSP5 PF	1.032	77	18	71536	OSP6 PF	1.032	108	24	71084	NEA GTPF	1.049	110	40*
71085	NEA GTPF	1.049	110	40*	71086	NEA STPF	1.066	80	55*	72666	FRSQ SC1	0.991	46	3
72667	FRSQ SC2	0.991	46	-2	72668	FRSQ SC3	0.991	46	-4	72661	MANCH09A	1.014	115	35*
72662	MANCH10A	1.014	115	35*	72663	MANCH11A	1.014	115	35*	72671	RISEG1CT	1.047	176	74
72672	RISEG3ST	1.045	196	74	72673	RISEG2CT	1.047	176	74	72373	MPLP 1PF	0.000	0	0
72374	MPLP 2PF	0.000	0	0	71251	CANAL G1	1.043	566	239	71252	CANAL G2	1.017	576	100*
71094	PLGRM G1	1.029	670	80	71092	EDG ST	1.008	311	-2	71093	EDG GTS	1.009	507	-2
71522	SOM G6	0.944	105	3	72669	TIVER G1	0.985	189	-8	72670	TIVER G2	0.990	92	-4
71524	DGHTNPWR	0.996	185	30*										

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	869	BRPT-ENERGY	454	162	MIDDLETOWN	350	46
MONTVILLE	483	92	NORWALK	162	35	BPTHBR	397	56
NHHARBOUR	447	175	DEVON	107	47	MERIDEN	0	0
WALLINGFORD	255	28	BERKSHIRE	305	53	LAKEROAD	585	232
STONYBROOK	412	159	MILLENNIUM	390	91	BRAYTONPT	859	197
HOPE	548	221	FRSQ	484	101	SOMERSET	105	3
OSP	524	120	NEA	299	135	CANAL	1142	339
PILGRIM	670	80	MASSPWRR	282	68	ANP-BELLINGHAM	0	0
ANP-BLACKSTONE	669	234	EMI-TIVERTON	281	-12	EMI-DIGHTON	185	30
SITHE-EDGAR	818	-4	MYSTIC	565	128	NEWBOSTON	0	0
SALEMHBR	662	120	SITHE-MYSTIC	1535	609	SEABROOK	1318	375
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	146	33
MERRIMACK	469	4	WYMAN	831	219	VTYANKEE	667	150
BEARSWAMP	525	157	NORTHFIELD	1080	320	ALTRESCO	146	27
MIS	549	235	AEC	164	93	RPA	272	121
WESTBROOK	565	214	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0	NY	332	288			

INTERFACE FLOWS

NB-NE	1000	-180	ORRING-SOUTH	1227	177	SUROWIEC-SOUTH	909	-40
MEYANKEE-SOUTH	875	-140	MAINE-NH	1692	-14	NNE-SCOBIE+394	2740	287
SEABROOK-SOUTH	1491	243	NORTH-SOUTH	2736	-66	CMFD/MOORE-SO	287	59
SNDYPOND-SOUTH	2443	-299	CONN-IMPORT	1971	199	SWCT	2022	156
NE-NRWLK-STFD	1456	65	BOSTON IMPORT	2948	-620	SEMA/RI EXPORT	1885	-24
SEMA EXPORT	519	-394	EAST-WEST	2136	116	NY-NE 2200(170	-1225	179
NW VT	294	-24	PV20 PAR	100	-7<-2	BLISS PAR	0	-2
CROSS-SOUND	-346	130	LILCO	1	-48	214	144	4
F206	189	47						

HVDC TRANSFERS FROM H-Q

PHII-P1 = 1000

HIGHGATE = 211
PHII-P2 = 1000

BUS VOLTAGES

	V	LMT			V	LMT			V	LMT	
70001 CHESTER	357.			72692 NWGTN345	357.			72694 SEBRK345	355.		
71789 TEWKS	355.			70759 MYSTIC	360.			71797 MILLBURY	352.		
72925 LUDLOW	347.			72926 NRTHFLD	352.			73106 SOUTHGTN	337.		
73108 CARD	352.			73109 MONTVILE	351.			73110 MILLSTNE	355.		
73116 MIDDLTWN	345.			71801 BRAYTN P	358.			71811 KENT CO.	352.		
71326 BRIDGWTR	355.			71336 SHERMAN	357.			71338 OS POWER	357.		
71337 WFARNUM	355.			70772 W MEDWAY	355.			70780 WWALP345	356.		
70783 PILGRIM	358.			70773 NEA 336	358.			71193 CANAL	359.		
71133 CARVER	357.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	237.		
70793 MDFRM230	240.			70794 MDWLT230	240.			70818 MYSTC MA	119.		
71891 SALEM HR	119.			72096 MILLBURY	114.		0.0	71377 SOMERSET	116.		
72277 MIDWEYMT	117.			72259 MINK 183	118.			72574 WARRN 84	115.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	114.			71379 SWANSEA	116.			72269 WITNPD43	114.		
72278 FIELD 1	117.			72266 READ ST	115.			72267 S WREN29	110.		
72254 DEPOT129	112.			72255 DEPOT130	112.			72582 WOONSCKT	117.		
71403 WFARNUM	117.			72579 WOLF 171	118.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	116.		12.6
72565 KENT CO	116.		75.6 *	72570 SOCK187	115.			72571 SOCK188	115.		
72557 DAVIST85	116.			72559 DAVIS 90	115.			72572 W.KINGST	116.		37.8 *
72538 KENYON	116.			72581 WOOD RIV	116.			70512 ESX B-2	116.		
70487 COOL 345	354.			70520 W RUTLND	117.			73281 EXETR PF	116.		
90000 Q166-POI	117.			72760 POTOK PH	117.			72731 LOST NAT	116.		
72752 WHITEFLD	117.			71838 MOORE	119.			72713 BERLIN	116.		
72729 LITTLTN	119.			72753 WOODSTKH	116.			70496 GRAN 230	232.		
91000 Q229_LINK	116.			72759 PEMI	113.			72712 BEEBE	116.		
94001 Q345 115 2	0.	*E									

AREA/ZONE TOTALS

ISO-NE_GEN	28848	ISO-NE_LOAD	29972	ISO-NE_LOSS	878	
ISO-NE_INT	-2009					
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2007 SERIES, NERC/MMWG BASE CASE LIBRARY
2013 SUMMER PEAK - Q345 - POST-PROJECT POI-2

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.974	667	150*	73072	ALT12 PF	1.024	65	14*	73073	ALT34 PF	1.023	81	14
72986	BERKPWR	1.035	305	53	73069	MAPR1 PF	1.014	96	23	73070	MAPR2 PF	1.015	96	23
73071	MAPR3 PF	1.011	90	23	73085	MT.TOM	1.007	146	20	72512	BRSWP G1	1.019	294	78
72513	BRSWP G2	1.021	231	78	73083	NRTHFD3	1.012	270	80*	73033	NRTHFLD1	1.012	270	80*
73034	NRTHFLD2	1.016	270	80*	73084	NRTHFD4	1.012	270	80*	72930	STNYBK1A	1.041	65	26
72931	STNYBK1B	1.041	65	26	72932	STNYBK1C	1.041	65	26	72933	STNYBK 1	1.041	87	29
72934	STNYBK2A	1.041	65	26	72935	STNYBK2B	1.041	65	26	73080	WSPFLD 3	0.996	107	6
72244	MILLENST	1.012	117	28	72243	MILLENCT	1.015	273	63	70479	SHFLDWND	0.996	30	0*
70480	SHFDWND2	0.992	10	0*	70644	VPPSA	1.030	48	2	70712	ESSEX 19	1.023	8	0

~~~CT~~~

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73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	1.032	280	116	73566	LAKERD#2	1.031	305	116
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	1.046	93	4*	73550	SMD1314J	1.046	93	4*
73594	WALL LV1	1.017	102	10	73595	WALL LV2	1.017	102	10	73596	WALL LV3	1.017	51	7
73538	AESTH PF	1.006	180	34	73652	BE 11	1.023	104	54	73653	BE 12	1.017	170	54
73654	BE 10 ST	1.019	180	54	73647	BPTHBR#2	0.000	0	0	73648	BPTHBR#3	0.976	375	54
73570	DEVGAS11	1.071	42	30*	73571	DEVGAS12	1.090	42	30*	73572	DEVGAS13	1.091	42	30*
73573	DEVGAS14	1.072	42	30*	73553	DEVON#7	1.026	107	47*	73554	DEVON#8	0.000	0	0
73574	MILFD#1	1.017	280	47	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.993	447	175*
73551	NORHAR#1	1.001	162	35	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.008	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.107	179	79	70061	MIS GT2	1.107	179	79	70062	MIS ST	1.106	191	78
70377	AEC G1	1.102	55	31	70378	AEC G2	1.103	55	31	70379	AEC G3	1.102	55	31
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.963	15	6*	70424	CHAMP G3	0.000	0	0
70425	NEWPCOGN	1.021	110	33*	70381	RPA CG1	1.063	179	78	70382	RPA SG2	1.069	93	42
70422	WARRN G1	1.065	51	15*	70423	WARRN G2	1.085	45	11*	70386	WBK G1	1.037	185	71
70387	WBK G2	1.037	185	71	70388	WBK G3	1.037	196	73	70365	WF WY #1	1.008	50	8
70366	WF WY #2	1.008	50	8	70367	WF WY #3	1.008	95	15	70368	WF WY #4	1.032	636	188
71857	COMRF G1	1.022	24	4	71858	COMRF G2	1.019	48	4	71859	COMRF G3	1.019	48	4
71860	COMRF G4	1.019	48	4	71861	MOORE G1	1.009	48	4	71862	MOORE G2	1.019	48	4
71863	MOORE G3	1.004	48	4	71864	MOORE G4	1.015	48	4	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.029	169	105*	72703	CONEDG2	1.029	169	105*	72704	CONEDG3	1.029	195	119
71950	GRANRDG1	1.059	280	66	71951	GRANRDG2	1.050	280	97	72701	AESSTG	1.035	264	40
72760	POTOK PH	0.000	0	0	72866	MERMK G1	1.001	113	1	72867	MERMK G2	0.999	356	2
72869	SBRK G1	1.006	1318	375*	72870	SCHILLER	0.976	48	11	72872	SCHILLER	0.976	48	11
72871	SCHILLER	0.976	50	11	72918	L NATION	0.000	0	0	90020	Q166-DIX	0.000	0	0
90030	Q166-OWL	1.050	18	3	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	0.000	0	0	72742	TAMWORTH	0.000	0	0	72758	SMITH HY	0.000	0	0
72812	JACKMAN	1.019	13	0*	72820	NORTH 34	1.028	14	0*	72835	LACONIA	1.006	3	0*
72837	WEBSTER	1.012	6	0*	72840	AYERS	1.032	9	0*	72845	BERLIN	1.010	14	0*
72873	WL JET	0.998	18	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	4	-1
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	0.000	0	0	70233	SPRUCEG1	1.011	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	1.043	30	0*
70084	LFCOLL2	1.037	20	0*	88001	Q305-01-	1.050	18	4	88010	Q305-10-	1.050	16	3
88018	Q305-18-	1.050	16	3	88026	Q305-26-	1.050	16	3	70449	OAK HILL	1.023	26	0*
91870	AMPRSND	1.013	13	-4	9568	S01_GEN	1.034	3	0*	9569	S02_GEN	1.034	3	0*
9570	S03_GEN	1.033	3	0*	9571	S04_GEN	1.033	3	0*	9572	S05_GEN	1.033	3	0*
9573	S06_GEN	1.034	3	0*	9574	S07_GEN	1.035	3	0*	9575	S08_GEN	1.034	3	0*
9576	S09_GEN	1.034	3	0*	9577	S10_GEN	1.034	3	0*	9578	S11_GEN	1.034	3	0*
9579	S12_GEN	1.034	3	0*	9921	T01_GEN	1.042	3	0*	9922	T02_GEN	1.043	3	0*
9923	T03_GEN	1.045	3	0*	9924	T04_GEN	1.045	3	0*	9925	T05_GEN	1.045	3	0*
9926	T06_GEN	1.046	3	0*	9927	T07_GEN	1.046	3	0*	155	CPD WINC	1.027	18	-3*
94030	WTG-N6	1.050	2	0	94040	WTG-N1	1.050	2	0	94050	WTG-N2	1.050	2	0
94060	WTG-N3	1.050	2	0	94070	WTG-N4	1.050	2	0	94080	WTG-N5	1.050	2	0
94090	WTG-W1	1.050	2	0	94100	WTG-W2	1.050	2	0	94110	WTG-W3	1.050	2	0
94120	WTG-W4	1.050	2	0	94130	WTG-W5	1.050	2	0	94140	WTG-W6	1.050	2	0
94155	WTG-E2	1.050	2	0	94165	WTG-E3	1.050	2	0	94165	WTG-E3	1.050	2	0
94175	WTG-E6	1.050	2	0	94190	WTG-E5	1.050	2	0	94200	WTG-E4	1.050	2	0
94210	WTG-E7	1.050	2	0	94220	WTG-E8	1.050	2	0	94230	WTG-E9	1.050	2	0
94240	WTG-E10	1.050	2	0	94250	WTG-E11	1.050	2	0	94265	WTG-E12	1.050	2	0
94275	WTG-E13	1.050	2	0										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0	71067	MYS8 GTS	1.038	495	128	71068	MYS8 ST	1.062	290	128
71069	MYS9 GTS	1.039	460	169	71070	MYS9 ST	1.076	290	183	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	1.024	565	128
71947 SALEM G2	1.025	78	12	71948 SALEM G3	1.021	143	24	71949 SALEM G4	1.022	360	72
72059 LENERG1	1.040	65	17	72060 LENERG2	1.033	20	7	71946 SALEM G1	1.025	81	12
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71095 ANPBLCK1	1.080	335	117	71096 ANPBLCK2	1.080	335	117	72377 BELL #1	0.000	0	0
72378 BELL #2	0.000	0	0	72372 BP #1 GN	0.000	0	0	72375 BP #2 GN	0.000	0	0
72370 BP #3 GN	1.026	433	113	72371 BP #4 GN	1.031	425	84	71531 OSP1 PF	1.032	77	18
71532 OSP2 PF	1.032	77	18	71533 OSP3 PF	1.032	108	24	71534 OSP4 PF	1.032	77	18
71535 OSP5 PF	1.032	77	18	71536 OSP6 PF	1.032	108	24	71084 NEA GTPF	1.049	110	40*
71085 NEA GTPF	1.049	110	40*	71086 NEA STPF	1.066	80	55*	72666 FRSQ SC1	0.991	46	3
72667 FRSQ SC2	0.991	46	-2	72668 FRSQ SC3	0.991	46	-4	72661 MANCH09A	1.014	115	35*
72662 MANCH10A	1.014	115	35*	72663 MANCH11A	1.014	115	35*	72671 RISEG1CT	1.047	176	74
72672 RISEG3ST	1.045	196	74	72673 RISEG2CT	1.047	176	74	72373 MPLP 1PF	0.000	0	0
72374 MPLP 2PF	0.000	0	0	71251 CANAL G1	1.043	566	239	71252 CANAL G2	1.017	576	100*
71094 PLGRM G1	1.029	670	80	71092 EDG ST	1.008	311	-2	71093 EDG GTS	1.009	507	-2
71522 SOM G6	0.944	105	3	72669 TIVER G1	0.985	189	-8	72670 TIVER G2	0.990	92	-4
71524 DGHTNPWR	0.996	185	30*								

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	869	BRPT-ENERGY	454	162	MIDDLETOWN	350	46
MONTVILLE	483	92	NORWALK	162	35	BPTHBR	397	56
NHHARBOUR	447	175	DEVON	107	47	MERIDEN	0	0
WALLINGFORD	255	28	BERKSHIRE	305	53	LAKEROAD	585	232
STONYBROOK	412	159	MILLENNIUM	390	91	BRAYTONPT	858	197
HOPE	548	221	FRSQ	484	101	SOMERSET	105	3
OSP	524	120	NEA	299	135	CANAL	1142	339
PILGRIM	670	80	MASSPWRR	282	68	ANP-BELLINGHAM	0	0
ANP-BLACKSTONE	669	234	EMI-TIVERTON	281	-12	EMI-DIGHTON	185	30
SITHE-EDGAR	818	-4	MYSTIC	565	128	NEWBOSTON	0	0
SALEMHBR	662	120	SITHE-MYSTIC	1535	609	SEABROOK	1318	375
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	146	33
MERRIMACK	469	2	WYMAN	831	219	VTYANKEE	667	150
BEARSWAMP	525	157	NORTHFIELD	1080	320	ALTRESCO	146	27
MIS	549	235	AEC	164	93	RPA	272	121
WESTBROOK	565	214	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0	NY	332	288			

INTERFACE FLOWS

NB-NE	1000	-180	ORRING-SOUTH	1227	177	SUROWIEC-SOUTH	909	-40
MEYANKEE-SOUTH	875	-140	MAINE-NH	1692	-15	NNE-SCOBIE+394	2741	287
SEABROOK-SOUTH	1491	243	NORTH-SOUTH	2737	-66	CMFD/MOORE-SO	287	58
SNDYPOND-SOUTH	2444	-299	CONN-IMPORT	1971	199	SWCT	2022	156
NE-NRWLK-STFD	1456	65	BOSTON IMPORT	2948	-620	SEMA/RI EXPORT	1884	-24
SEMA EXPORT	519	-394	EAST-WEST	2136	117	NY-NE 2200(170	-1224	179
NW VT	294	-24	PV20 PAR	100	-7<-2	BLISS PAR	0	-2
CROSS-SOUND	-346	130	LILCO	1	-48	214	144	3
F206	189	47						

HVDC TRANSFERS FROM H-Q

PHII-P1 = 1000

HIGHGATE = 211
PHII-P2 = 1000

BUS VOLTAGES

	V	LMT			V	LMT			V	LMT	
70001 CHESTER	357.			72692 NWGTN345	357.			72694 SEBRK345	355.		
71789 TEWKS	355.			70759 MYSTIC	360.			71797 MILLBURY	352.		
72925 LUDLOW	347.			72926 NRTHFLD	352.			73106 SOUTHGTN	337.		
73108 CARD	352.			73109 MONTVILE	351.			73110 MILLSTNE	355.		
73116 MIDDLTWN	345.			71801 BRAYTN P	358.			71811 KENT CO.	352.		
71326 BRIDGWTR	355.			71336 SHERMAN	357.			71338 OS POWER	357.		
71337 WFARNUM	355.			70772 W MEDWAY	355.			70780 WWALP345	356.		
70783 PILGRIM	358.			70773 NEA 336	358.			71193 CANAL	359.		
71133 CARVER	357.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	237.		
70793 MDFRM230	240.			70794 MDWLT230	240.			70818 MYSTC MA	119.		
71891 SALEM HR	119.			72096 MILLBURY	114.		0.0	71377 SOMERSET	116.		
72277 MIDWEYMT	117.			72259 MINK 183	118.			72574 WARRN 84	115.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	114.			71379 SWANSEA	116.			72269 WITNPD43	114.		
72278 FIELD 1	117.			72266 READ ST	115.			72267 S WREN29	110.		
72254 DEPOT129	112.			72255 DEPOT130	112.			72582 WOONSCKT	117.		
71403 WFARNUM	117.			72579 WOLF 171	118.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	116.		12.6
72565 KENT CO	116.		75.6 *	72570 SOCK187	115.			72571 SOCK188	115.		
72557 DAVIST85	116.			72559 DAVIS 90	115.			72572 W.KINGST	116.		37.8 *
72538 KENYON	116.			72581 WOOD RIV	116.			70512 ESX B-2	116.		
70487 COOL 345	354.			70520 W RUTLND	117.			73281 EXETR PF	116.		
90000 Q166-POI	117.			72760 POTOK PH	117.			72731 LOST NAT	116.		
72752 WHITEFLD	117.			71838 MOORE	119.			72713 BERLIN	116.		
72729 LITTLTN	119.			72753 WOODSTKH	117.			70496 GRAN 230	232.		
91000 Q229_LINK	116.			72759 PEMI	114.			72712 BEEBE	116.		
94001 Q345 TAP	116.										

AREA/ZONE TOTALS

ISO-NE_GEN	28847	ISO-NE_LOAD	29972	ISO-NE_LOSS	877
ISO-NE_INT	-2009				
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2007 SERIES, NERC/MMWG BASE CASE LIBRARY
2013 SUMMER SHOULDER - Q345 - PRE-PROJECT

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.983	667	150*	73072	ALT12 PF	1.020	65	10	73073	ALT34 PF	1.019	81	10
72986	BERKPWR	0.000	0	0	73069	MAPR1 PF	1.015	84	22	73070	MAPR2 PF	1.015	84	22
73071	MAPR3 PF	1.011	79	22	73085	MT.TOM	0.000	0	0	72512	BRSWP G1	0.000	0	0
72513	BRSWP G2	1.024	202	85	73083	NRTHFD3	1.013	270	80*	73033	NRTHFLD1	1.013	270	80*
73034	NRTHFLD2	0.000	0	0	73084	NRTHFD4	0.000	0	0	72930	STNYBK1A	1.041	65	21
72931	STNYBK1B	1.041	65	21	72932	STNYBK1C	1.041	65	21	72933	STNYBK 1	1.041	86	23
72934	STNYBK2A	1.041	65	21	72935	STNYBK2B	1.041	65	21	73080	WSPFLD 3	0.000	0	0
72244	MILLENST	0.000	0	0	72243	MILLENCT	0.985	273	7	70479	SHFLDWND	0.000	0	0
70480	SHFDWND2	0.000	0	0	70644	VPPSA	1.030	48	1	70712	ESSEX 19	1.032	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	1.016	940	355	73563	MILL#3	1.018	1260	470	73558	MONTV#5	0.968	81	0
73559	MONTV#6	0.000	0	0	73555	MIDDTN#2	1.001	117	24	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	0.000	0	0	73566	LAKERD#2	0.000	0	0
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	1.051	93	4*	73550	SMD1314J	1.051	93	4*
73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0	73596	WALL LV3	0.000	0	0
73538	AESTH PF	0.984	180	0	73652	BE 11	1.016	91	45	73653	BE 12	1.009	170	45
73654	BE 10 ST	0.000	0	0	73647	BPTHBR#2	0.996	170	45	73648	BPTHBR#3	0.000	0	0
73570	DEVGAS11	0.000	0	0	73571	DEVGAS12	0.000	0	0	73572	DEVGAS13	0.000	0	0
73573	DEVGAS14	0.000	0	0	73553	DEVON#7	0.000	0	0	73554	DEVON#8	0.000	0	0
73574	MILFD#1	1.042	280	105	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.000	0	0
73551	NORHAR#1	0.000	0	0	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.009	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.107	159	64	70061	MIS GT2	1.107	160	64	70062	MIS ST	1.106	176	63
70377	AEC G1	1.094	50	27	70378	AEC G2	1.095	50	27	70379	AEC G3	1.094	50	27
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.000	0	0	70424	CHAMP G3	0.000	0	0
70425	NEWPCOGN	1.021	110	33*	70381	RPA CG1	1.056	179	67	70382	RPA SG2	1.063	93	36
70422	WARRN G1	1.075	51	15*	70423	WARRN G2	1.095	45	11*	70386	WBK G1	1.031	174	62
70387	WBK G2	1.031	174	62	70388	WBK G3	1.031	189	64	70365	WF WY #1	0.000	0	0
70366	WF WY #2	0.000	0	0	70367	WF WY #3	0.000	0	0	70368	WF WY #4	1.021	636	134
71857	COMRF G1	1.015	24	0	71858	COMRF G2	1.012	48	0	71859	COMRF G3	1.012	48	0
71860	COMRF G4	1.012	48	0	71861	MOORE G1	0.000	0	0	71862	MOORE G2	1.015	48	1
71863	MOORE G3	1.003	48	1	71864	MOORE G4	1.013	48	1	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.015	169	72	72703	CONEDG2	1.015	169	72	72704	CONEDG3	0.000	0	0
71950	GRANRDG1	0.000	0	0	71951	GRANRDG2	0.000	0	0	72701	AESSTG	1.035	264	26
72760	POTOK PH	0.000	0	0	72866	MERMK G1	1.026	113	14	72867	MERMK G2	1.024	356	40
72869	SBRK G1	1.008	1318	316	72870	SCHILLER	0.000	0	0	72872	SCHILLER	0.000	0	0
72871	SCHILLER	0.000	0	0	72918	L NATION	0.000	0	0	90020	Q166-DIX	1.050	9	1
90030	Q166-OWL	0.000	0	0	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	1.029	15	0*	72742	TAMWORTH	1.036	20	0*	72758	SMITH HY	0.000	0	0*
72812	JACKMAN	1.031	12	0*	72820	NORTH 34	1.034	14	0*	72835	LACONIA	1.012	3	0*
72837	WEBSTER	0.000	0	0*	72840	AYERS	1.032	9	0*	72845	BERLIN	1.015	14	0*
72873	WL JET	1.006	18	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	17	0
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	0.000	0	0	70233	SPRUCEG1	1.018	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	1.043	30	0*
70084	LFCOLL2	1.038	20	0*	88001	Q305-01-	1.050	18	2	88010	Q305-10-	1.050	16	2
88018	Q305-18-	1.050	16	2	88026	Q305-26-	1.050	16	2	70449	OAK HILL	1.034	13	0*
91870	AMPRSND	1.019	13	-4	9568	S01_GEN	1.038	3	0*	9569	S02_GEN	1.037	3	0*
9570	S03_GEN	1.037	3	0*	9571	S04_GEN	0.000	0	0*	9572	S05_GEN	1.037	3	0*
9573	S06_GEN	1.038	3	0*	9574	S07_GEN	1.038	3	0*	9575	S08_GEN	1.037	3	0*
9576	S09_GEN	1.037	3	0*	9577	S10_GEN	1.037	3	0*	9578	S11_GEN	1.037	3	0*
9579	S12_GEN	1.038	3	0*	9921	T01_GEN	1.043	3	0*	9922	T02_GEN	1.044	3	0*
9923	T03_GEN	1.045	3	0*	9924	T04_GEN	1.045	3	0*	9925	T05_GEN	1.046	3	0*
9926	T06_GEN	1.046	3	0*	9927	T07_GEN	1.047	3	0*	155	CPD WINC	1.024	18	-3*
94030		0.000	0	0*	94040		0.000	0	0*	94050		0.000	0	0*
94060		0.000	0	0*	94070		0.000	0	0*	94080		0.000	0	0*
94090		0.000	0	0*	94100		0.000	0	0*	94110		0.000	0	0*
94120		0.000	0	0*	94130		0.000	0	0*	94140		0.000	0	0*
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94155	0.000	0	0*	94165	0.000	0	0*	94165	0.000	0	0*
94175	0.000	0	0*	94190	0.000	0	0*	94200	0.000	0	0*
94210	0.000	0	0*	94220	0.000	0	0*	94230	0.000	0	0*
94240	0.000	0	0*	94250	0.000	0	0*	94265	0.000	0	0*
94275	0.000	0	0*								

~~~NEMA~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71126 KEND CT	0.000	0	0*	71067 MYS8 GTS	1.005	463	-35	71068 MYS8 ST	0.995	290	-35
71069 MYS9 GTS	0.987	432	-81	71070 MYS9 ST	1.021	290	43	71060 MYST G4	0.000	0	0
71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	1.005	565	-35
71947 SALEM G2	1.018	78	4	71948 SALEM G3	1.013	143	7	71949 SALEM G4	0.000	0	0
72059 LENERG1	1.003	65	-20	72060 LENERG2	1.005	20	-15	71946 SALEM G1	1.018	80	4
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71095 ANPBLCK1	1.074	293	96	71096 ANPBLCK2	0.000	0	0	72377 BELL #1	0.973	273	-100
72378 BELL #2	0.000	0	0	72372 BP #1 GN	0.000	0	0	72375 BP #2 GN	0.000	0	0
72370 BP #3 GN	1.018	435	42	72371 BP #4 GN	0.000	0	0	71531 OSP1 PF	1.032	77	18
71532 OSP2 PF	1.032	77	18	71533 OSP3 PF	1.032	100	23	71534 OSP4 PF	1.032	77	18
71535 OSP5 PF	1.032	77	18	71536 OSP6 PF	1.032	100	23	71084 NEA GTPF	1.040	96	29
71085 NEA GTPF	1.040	96	29	71086 NEA STPF	1.041	80	29	72666 FRSQ SC1	0.991	43	0
72667 FRSQ SC2	0.991	43	-2	72668 FRSQ SC3	0.991	41	-5	72661 MANCH09A	1.013	101	35*
72662 MANCH10A	0.000	0	0	72663 MANCH11A	0.000	0	0	72671 RISEG1CT	1.030	176	43
72672 RISEG3ST	1.028	196	43	72673 RISEG2CT	0.000	0	0	72373 MPLP 1PF	0.000	0	0
72374 MPLP 2PF	1.024	45	12	71251 CANAL G1	1.026	566	172	71252 CANAL G2	0.000	0	0
71094 PLGRM G1	1.019	670	11	71092 EDG ST	0.000	0	0	71093 EDG GTS	0.987	479	-110
71522 SOM G6	0.956	105	0	72669 TIVER G1	0.000	0	0	72670 TIVER G2	0.961	92	-40
71524 DGHTNPWR	1.010	185	30*								

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	825	BRPT-ENERGY	261	90	MIDDLETOWN	117	24
MONTVILLE	81	0	NORWALK	0	0	BPTHBR	192	47
NHHARBOUR	0	0	DEVON	0	0	MERIDEN	0	0
WALLINGFORD	0	0	BERKSHIRE	0	0	LAKEROAD	0	0
STONYBROOK	411	127	MILLENNIUM	273	7	BRAYTONPT	435	42
HOPE	372	87	FRSQ	228	29	SOMERSET	105	0
OSP	510	120	NEA	272	88	CANAL	566	172
PILGRIM	670	11	MASSPWRR	247	65	ANP-BELLINGHAM	273	-100
ANP-BLACKSTONE	293	96	EMI-TIVERTON	92	-40	EMI-DIGHTON	185	30
SITHE-EDGAR	479	-110	MYSTIC	565	-35	NEWBOSTON	0	0
SALEMHBR	301	14	SITHE-MYSTIC	1475	-107	SEABROOK	1318	316
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	0	0
MERRIMACK	469	55	WYMAN	636	134	VTYANKEE	667	150
BEARSWAMP	202	85	NORTHFIELD	540	160	ALTRESCO	146	21
MIS	495	191	AEC	151	80	RPA	272	103
WESTBROOK	537	187	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0	NY	295	288			

INTERFACE FLOWS

NB-NE	999	-182	ORRING-SOUTH	1178	181	SUROWIEC-SOUTH	1059	-69
MEYANKEE-SOUTH	900	-145	MAINE-NH	1797	-58	NNE-SCOBIE+394	2775	86
SEABROOK-SOUTH	1429	128	NORTH-SOUTH	3016	-132	CMFD/MOORE-SO	268	15
SNDYPOND-SOUTH	1701	-139	CONN-IMPORT	1701	-11	SWCT	1825	-115
NE-NRWLK-STFD	1067	12	BOSTON IMPORT	1478	-545	SEMA/RI EXPORT	1085	-363
SEMA EXPORT	405	-424	EAST-WEST	2337	11	NY-NE 2200(170	-1224	61
NW VT	128	-24	PV20 PAR	100	-7<-10	BLISS PAR	0	-3
CROSS-SOUND	-346	128	LILCO	1	-49	214	129	-6
F206	123	49						

HVDC TRANSFERS FROM H-Q

PHII-P1 = 500

HIGHGATE = 211
PHII-P2 = 500

BUS VOLTAGES

	V	LMT		V	LMT		V	LMT	
70001 CHESTER	357.		72692 NWGTN345	357.		72694 SEBRK345	357.		
71789 TEWKS	358.		70759 MYSTIC	360.		71797 MILLBURY	355.		
72925 LUDLOW	351.		72926 NRTHFLD	354.		73106 SOUTHGTN	339.		
73108 CARD	355.		73109 MONTVILE	352.		73110 MILLSTNE	357.		
73116 MIDDLTWN	347.		71801 BRAYTN P	358.		71811 KENT CO.	356.		
71326 BRIDGWTR	357.		71336 SHERMAN	357.		71338 OS POWER	357.		
71337 WFARNUM	357.		70772 W MEDWAY	357.		70780 WWALP345	358.		
70783 PILGRIM	358.		70773 NEA 336	358.		71193 CANAL	359.		
71133 CARVER	359.		70655 SHELBRNE	116.	L	70795 FRMNGHAM	243.	H	
70793 MDFRM230	244.	H	70794 MDWLT230	243.	H	70818 MYSTC MA	119.		
71891 SALEM HR	119.		72096 MILLBURY	118.	0.0	71377 SOMERSET	118.		
72277 MIDWEYMT	117.		72259 MINK 183	118.		72574 WARRN 84	117.		
72569 FRSQ	119.	0.0	72566 PHILP183	119.		72553 ADMIRAL3	119.		
71405 PAWTUCKT	117.		71379 SWANSEA	118.		72269 WITNPD43	118.		
72278 FIELD 1	117.		72266 READ ST	117.		72267 S WREN29	116.		
72254 DEPOT129	117.		72255 DEPOT130	117.		72582 WOONSCKT	118.		
71403 WFARNUM	118.		72579 WOLF 171	119.		72584 HARTAVE	119.		
72544 JOHNSTN1	119.	0.0	72545 JOHNSTN2	119.	0.0	72560 DRUMROCK	118.	12.6	
72565 KENT CO	118.	75.6 *	72570 SOCK187	117.		72571 SOCK188	117.		
72557 DAVIST85	118.		72559 DAVIS 90	118.		72572 W.KINGST	117.	18.9 *	

72538	KENYON	117.	72581	WOOD RIV	117.	70512	ESX B-2	116.
70487	COOL 345	360.	70520	W RUTLND	117.	73281	EXETR PF	116.
90000	Q166-POI	117.	72760	POTOK PH	117.	72731	LOST NAT	117.
72752	WHITEFLD	118.	71838	MOORE	119.	72713	BERLIN	117.
72729	LITTLTN	119.	72753	WOODSTKH	118.	70496	GRAN 230	233.
91000	Q229_LINK	117.	72759	PEMI	117.	72712	BEEBE	118.
94001	Q345 115 2	0. *E						

AREA/ZONE TOTALS

ISO-NE_GEN	20436	ISO-NE_LOAD	20778	ISO-NE_LOSS	650
ISO-NE_INT	-999				

2007 SERIES, NERC/MMWG BASE CASE LIBRARY
2013 SUMMER SHOULDER - Q345 - POST-PROJECT POI-1

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.983	667	150*	73072	ALT12 PF	1.020	65	10	73073	ALT34 PF	1.019	81	10
72986	BERKPWR	0.000	0	0	73069	MAPR1 PF	1.015	84	22	73070	MAPR2 PF	1.015	84	22
73071	MAPR3 PF	1.011	79	22	73085	MT.TOM	0.000	0	0	72512	BRSWP G1	0.000	0	0
72513	BRSWP G2	1.024	202	85	73083	NRTHFD3	1.013	270	80*	73033	NRTHFLD1	1.013	270	80*
73034	NRTHFLD2	0.000	0	0	73084	NRTHFD4	0.000	0	0	72930	STNYBK1A	1.041	65	21
72931	STNYBK1B	1.041	65	21	72932	STNYBK1C	1.041	65	21	72933	STNYBK 1	1.041	86	23
72934	STNYBK2A	1.041	65	21	72935	STNYBK2B	1.041	65	21	73080	WSPFLD 3	0.000	0	0
72244	MILLENST	0.000	0	0	72243	MILLENCT	0.985	273	7	70479	SHFLDWND	0.000	0	0
70480	SHFDWND2	0.000	0	0	70644	VPPSA	1.030	48	1	70712	ESSEX 19	1.032	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	1.016	940	355	73563	MILL#3	1.018	1260	471	73558	MONTV#5	0.968	81	0
73559	MONTV#6	0.000	0	0	73555	MIDDTN#2	1.001	117	24	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	0.000	0	0	73566	LAKERD#2	0.000	0	0
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	1.051	93	4*	73550	SMD1314J	1.051	93	4*
73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0	73596	WALL LV3	0.000	0	0
73538	AESTH PF	0.984	180	0	73652	BE 11	1.016	91	45	73653	BE 12	1.009	170	45
73654	BE 10 ST	0.000	0	0	73647	BPTHBR#2	0.996	170	45	73648	BPTHBR#3	0.000	0	0
73570	DEVGAS11	0.000	0	0	73571	DEVGAS12	0.000	0	0	73572	DEVGAS13	0.000	0	0
73573	DEVGAS14	0.000	0	0	73553	DEVON#7	0.000	0	0	73554	DEVON#8	0.000	0	0
73574	MILFD#1	1.042	280	105	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.000	0	0
73551	NORHAR#1	0.000	0	0	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.009	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.107	159	64	70061	MIS GT2	1.107	160	64	70062	MIS ST	1.106	176	63
70377	AEC G1	1.094	50	27	70378	AEC G2	1.095	50	27	70379	AEC G3	1.094	50	27
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.000	0	0	70424	CHAMP G3	0.000	0	0
70425	NEWPCOGN	1.021	110	33*	70381	RPA CG1	1.056	179	67	70382	RPA SG2	1.063	93	36
70422	WARRN G1	1.075	51	15*	70423	WARRN G2	1.095	45	11*	70386	WBK G1	1.031	174	62
70387	WBK G2	1.031	174	62	70388	WBK G3	1.031	189	64	70365	WF WY #1	0.000	0	0
70366	WF WY #2	0.000	0	0	70367	WF WY #3	0.000	0	0	70368	WF WY #4	1.021	636	134
71857	COMRF G1	1.014	24	0	71858	COMRF G2	1.011	48	0	71859	COMRF G3	1.011	48	0
71860	COMRF G4	1.011	48	0	71861	MOORE G1	0.000	0	0	71862	MOORE G2	1.014	48	1
71863	MOORE G3	1.002	48	1	71864	MOORE G4	1.012	48	1	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.015	169	72	72703	CONEDG2	1.015	169	72	72704	CONEDG3	0.000	0	0
71950	GRANRDG1	0.000	0	0	71951	GRANRDG2	0.000	0	0	72701	AESSTG	1.035	264	25
72760	POTOK PH	0.000	0	0	72866	MERMK G1	1.026	113	14	72867	MERMK G2	1.024	356	40
72869	SBRK G1	1.008	1318	316	72870	SCHILLER	0.000	0	0	72872	SCHILLER	0.000	0	0
72871	SCHILLER	0.000	0	0	72918	L NATION	0.000	0	0	90020	Q166-DIX	1.050	9	1
90030	Q166-OWL	0.000	0	0	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	0.000	0	0	72742	TAMWORTH	0.000	0	0	72758	SMITH HY	0.000	0	0
72812	JACKMAN	1.031	12	0*	72820	NORTH 34	1.034	14	0*	72835	LACONIA	1.012	3	0*
72837	WEBSTER	0.000	0	0*	72840	AYERS	1.033	9	0*	72845	BERLIN	1.017	14	0*
72873	WL JET	1.007	18	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	4	-1
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	0.000	0	0	70233	SPRUCEG1	1.018	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	1.043	30	0*
70084	LFCOLL2	1.038	20	0*	88001	Q305-01-	1.050	18	2	88010	Q305-10-	1.050	16	2
88018	Q305-18-	1.050	16	2	88026	Q305-26-	1.050	16	2	70449	OAK HILL	1.034	13	0*
91870	AMPRSND	1.019	13	-4	9568	S01_GEN	1.038	3	0*	9569	S02_GEN	1.037	3	0*
9570	S03_GEN	1.037	3	0*	9571	S04_GEN	0.000	0	0*	9572	S05_GEN	1.037	3	0*
9573	S06_GEN	1.038	3	0*	9574	S07_GEN	1.038	3	0*	9575	S08_GEN	1.037	3	0*
9576	S09_GEN	1.037	3	0*	9577	S10_GEN	1.037	3	0*	9578	S11_GEN	1.037	3	0*
9579	S12_GEN	1.038	3	0*	9921	T01_GEN	1.043	3	0*	9922	T02_GEN	1.044	3	0*
9923	T03_GEN	1.045	3	0*	9924	T04_GEN	1.045	3	0*	9925	T05_GEN	1.046	3	0*
9926	T06_GEN	1.046	3	0*	9927	T07_GEN	1.047	3	0*	155	CPD WINC	1.024	18	-3*
94030	WTG-N6	1.050	2	0	94040	WTG-N1	1.050	2	0	94050	WTG-N2	1.050	2	0
94060	WTG-N3	1.050	2	0	94070	WTG-N4	1.050	2	0	94080	WTG-N5	1.050	2	0
94090	WTG-W1	1.050	2	0	94100	WTG-W2	1.050	2	0	94110	WTG-W3	1.050	2	0
94120	WTG-W4	1.050	2	0	94130	WTG-W5	1.050	2	0	94140	WTG-W6	1.050	2	0
94155	WTG-E2	1.050	2	0	94165	WTG-E3	1.050	2	0	94165	WTG-E3	1.050	2	0
94175	WTG-E6	1.050	2	0	94190	WTG-E5	1.050	2	0	94200	WTG-E4	1.050	2	0
94210	WTG-E7	1.050	2	0	94220	WTG-E8	1.050	2	0	94230	WTG-E9	1.050	2	0
94240	WTG-E10	1.050	2	0	94250	WTG-E11	1.050	2	0	94265	WTG-E12	1.050	2	0
94275	WTG-E13	1.050	2	0										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0	71067	MYS8 GTS	1.005	463	-35	71068	MYS8 ST	0.995	290	-35
71069	MYS9 GTS	0.987	432	-81	71070	MYS9 ST	1.021	290	43	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	1.005	565	-35
71947 SALEM G2	1.018	78	4	71948 SALEM G3	1.013	143	7	71949 SALEM G4	0.000	0	0
72059 LENERG1	1.003	65	-20	72060 LENERG2	1.005	20	-15	71946 SALEM G1	1.018	80	4
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71095 ANPBLCK1	1.074	293	96	71096 ANPBLCK2	0.000	0	0	72377 BELL #1	0.973	273	-100
72378 BELL #2	0.000	0	0	72372 BP #1 GN	0.000	0	0	72375 BP #2 GN	0.000	0	0
72370 BP #3 GN	1.018	438	42	72371 BP #4 GN	0.000	0	0	71531 OSP1 PF	1.032	77	18
71532 OSP2 PF	1.032	77	18	71533 OSP3 PF	1.032	100	23	71534 OSP4 PF	1.032	77	18
71535 OSP5 PF	1.032	77	18	71536 OSP6 PF	1.032	100	23	71084 NEA GTPF	1.040	96	29
71085 NEA GTPF	1.040	96	29	71086 NEA STPF	1.041	80	29	72666 FRSQ SC1	0.991	43	0
72667 FRSQ SC2	0.991	43	-2	72668 FRSQ SC3	0.991	41	-5	72661 MANCH09A	1.013	101	35*
72662 MANCH10A	0.000	0	0	72663 MANCH11A	0.000	0	0	72671 RISEG1CT	1.030	176	43
72672 RISEG3ST	1.028	196	43	72673 RISEG2CT	0.000	0	0	72373 MPLP 1PF	0.000	0	0
72374 MPLP 2PF	1.024	45	12	71251 CANAL G1	1.026	566	172	71252 CANAL G2	0.000	0	0
71094 PLGRM G1	1.019	670	11	71092 EDG ST	0.000	0	0	71093 EDG GTS	0.987	479	-110
71522 SOM G6	0.956	105	0	72669 TIVER G1	0.000	0	0	72670 TIVER G2	0.961	92	-40
71524 DGHTNPWR	1.010	185	30*								

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	826	BRPT-ENERGY	261	90	MIDDLETOWN	117	24
MONTVILLE	81	0	NORWALK	0	0	BPTHBR	192	47
NHHARBOUR	0	0	DEVON	0	0	MERIDEN	0	0
WALLINGFORD	0	0	BERKSHIRE	0	0	LAKEROAD	0	0
STONYBROOK	411	127	MILLENNIUM	273	7	BRAYTONPT	438	42
HOPE	372	87	FRSQ	228	29	SOMERSET	105	0
OSP	510	120	NEA	272	88	CANAL	566	172
PILGRIM	670	11	MASSPWRR	247	65	ANP-BELLINGHAM	273	-100
ANP-BLACKSTONE	293	96	EMI-TIVERTON	92	-40	EMI-DIGHTON	185	30
SITHE-EDGAR	479	-110	MYSTIC	565	-35	NEWBOSTON	0	0
SALEMHBR	301	14	SITHE-MYSTIC	1475	-107	SEABROOK	1318	316
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	0	0
MERRIMACK	469	54	WYMAN	636	134	VTYANKEE	667	150
BEARSWAMP	202	85	NORTHFIELD	540	160	ALTRESCO	146	21
MIS	495	191	AEC	151	80	RPA	272	103
WESTBROOK	537	187	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0	NY	294	288			

INTERFACE FLOWS
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NB-NE	999	-182	ORRING-SOUTH	1178	181	SUROWIEC-SOUTH	1058	-69
MEYANKEE-SOUTH	900	-145	MAINE-NH	1797	-58	NNE-SCOBIE+394	2773	85
SEABROOK-SOUTH	1428	128	NORTH-SOUTH	3014	-132	CMFD/MOORE-SO	268	12
SNDYPOND-SOUTH	1700	-138	CONN-IMPORT	1700	-11	SWCT	1824	-115
NE-NRWLK-STFD	1066	12	BOSTON IMPORT	1478	-545	SEMA/RI EXPORT	1088	-364
SEMA EXPORT	405	-424	EAST-WEST	2338	12	NY-NE 2200(170	-1225	61
NW VT	128	-24	PV20 PAR	100	-7<-11	BLISS PAR	0	-3
CROSS-SOUND	-346	128	LILCO	0	-48	214	131	-7
F206	124	49						

HVDC TRANSFERS FROM H-Q
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PHII-P1 = 500	HIGHGATE = 211
	PHII-P2 = 500

BUS VOLTAGES
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	V	LMT			V	LMT			V	LMT	
70001 CHESTER	357.			72692 NWGTN345	357.			72694 SEBRK345	357.		
71789 TEWKS	358.			70759 MYSTIC	360.			71797 MILLBURY	355.		
72925 LUDLOW	351.			72926 NRTHFLD	354.			73106 SOUTHGTN	339.		
73108 CARD	355.			73109 MONTVILE	352.			73110 MILLSTNE	357.		
73116 MIDDLTWN	347.			71801 BRAYTN P	358.			71811 KENT CO.	356.		
71326 BRIDGWTR	357.			71336 SHERMAN	357.			71338 OS POWER	357.		
71337 WFARNUM	357.			70772 W MEDWAY	357.			70780 WWALP345	358.		
70783 PILGRIM	358.			70773 NEA 336	358.			71193 CANAL	359.		
71133 CARVER	359.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	243.	H	
70793 MDFRM230	244.	H		70794 MDWLT230	243.	H		70818 MYSTC MA	119.		
71891 SALEM HR	119.			72096 MILLBURY	118.		0.0	71377 SOMERSET	118.		
72277 MIDWEYMT	117.			72259 MINK 183	118.			72574 WARRN 84	117.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	117.			71379 SWANSEA	118.			72269 WITNPD43	118.		
72278 FIELD 1	117.			72266 READ ST	117.			72267 S WREN29	116.		
72254 DEPOT129	117.			72255 DEPOT130	117.			72582 WOONSCKT	118.		
71403 WFARNUM	118.			72579 WOLF 171	119.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	118.		12.6
72565 KENT CO	118.		75.6 *	72570 SOCK187	117.			72571 SOCK188	117.		
72557 DAVIST85	118.			72559 DAVIS 90	118.			72572 W.KINGST	117.		18.9 *
72538 KENYON	117.			72581 WOOD RIV	117.			70512 ESX B-2	116.		
70487 COOL 345	360.			70520 W RUTLND	117.			73281 EXETR PF	116.		
90000 Q166-POI	118.			72760 POTOK PH	118.			72731 LOST NAT	117.		
72752 WHITEFLD	118.			71838 MOORE	119.			72713 BERLIN	117.		
72729 LITTLTN	119.			72753 WOODSTKH	119.			70496 GRAN 230	233.		
91000 Q229_LINK	117.			72759 PEMI	117.			72712 BEEBE	119.		
94001 Q345 115 2	0.	*E									

AREA/ZONE TOTALS
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ISO-NE_GEN	20439	ISO-NE_LOAD	20778	ISO-NE_LOSS	652
ISO-NE_INT	-998				
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2007 SERIES, NERC/MMWG BASE CASE LIBRARY
2013 SUMMER SHOULDER - Q345 - POST-PROJECT POI-2

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.983	667	150*	73072	ALT12 PF	1.020	65	10	73073	ALT34 PF	1.019	81	10
72986	BERKPWR	0.000	0	0	73069	MAPR1 PF	1.015	84	22	73070	MAPR2 PF	1.015	84	22
73071	MAPR3 PF	1.011	79	22	73085	MT.TOM	0.000	0	0	72512	BRSWP G1	0.000	0	0
72513	BRSWP G2	1.024	202	85	73083	NRTHFD3	1.013	270	80*	73033	NRTHFLD1	1.013	270	80*
73034	NRTHFLD2	0.000	0	0	73084	NRTHFD4	0.000	0	0	72930	STNYBK1A	1.041	65	21
72931	STNYBK1B	1.041	65	21	72932	STNYBK1C	1.041	65	21	72933	STNYBK 1	1.041	86	23
72934	STNYBK2A	1.041	65	21	72935	STNYBK2B	1.041	65	21	73080	WSPFLD 3	0.000	0	0
72244	MILLENST	0.000	0	0	72243	MILLENCT	0.985	273	7	70479	SHFLDWND	0.000	0	0
70480	SHFDWND2	0.000	0	0	70644	VPPSA	1.030	48	1	70712	ESSEX 19	1.032	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	1.016	940	355	73563	MILL#3	1.018	1260	471	73558	MONTV#5	0.968	81	0
73559	MONTV#6	0.000	0	0	73555	MIDDTN#2	1.001	117	24	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	0.000	0	0	73566	LAKERD#2	0.000	0	0
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	1.051	93	4*	73550	SMD1314J	1.051	93	4*
73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0	73596	WALL LV3	0.000	0	0
73538	AESTH PF	0.984	180	0	73652	BE 11	1.016	91	45	73653	BE 12	1.009	170	45
73654	BE 10 ST	0.000	0	0	73647	BPTHBR#2	0.996	170	45	73648	BPTHBR#3	0.000	0	0
73570	DEVGAS11	0.000	0	0	73571	DEVGAS12	0.000	0	0	73572	DEVGAS13	0.000	0	0
73573	DEVGAS14	0.000	0	0	73553	DEVON#7	0.000	0	0	73554	DEVON#8	0.000	0	0
73574	MILFD#1	1.042	280	105	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.000	0	0
73551	NORHAR#1	0.000	0	0	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.009	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.107	159	64	70061	MIS GT2	1.107	160	64	70062	MIS ST	1.106	176	63
70377	AEC G1	1.094	50	27	70378	AEC G2	1.095	50	27	70379	AEC G3	1.095	50	27
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.000	0	0	70424	CHAMP G3	0.000	0	0
70425	NEWPCOGN	1.021	110	33*	70381	RPA CG1	1.057	179	68	70382	RPA SG2	1.063	93	37
70422	WARRN G1	1.075	51	15*	70423	WARRN G2	1.095	45	11*	70386	WBK G1	1.031	174	62
70387	WBK G2	1.031	174	62	70388	WBK G3	1.032	189	64	70365	WF WY #1	0.000	0	0
70366	WF WY #2	0.000	0	0	70367	WF WY #3	0.000	0	0	70368	WF WY #4	1.021	636	135
71857	COMRF G1	1.015	24	1	71858	COMRF G2	1.013	48	1	71859	COMRF G3	1.013	48	1
71860	COMRF G4	1.013	48	1	71861	MOORE G1	0.000	0	0	71862	MOORE G2	1.015	48	1
71863	MOORE G3	1.003	48	1	71864	MOORE G4	1.013	48	1	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.015	169	72	72703	CONEDG2	1.015	169	72	72704	CONEDG3	0.000	0	0
71950	GRANRDG1	0.000	0	0	71951	GRANRDG2	0.000	0	0	72701	AESSTG	1.035	264	26
72760	POTOK PH	0.000	0	0	72866	MERMK G1	1.027	113	15	72867	MERMK G2	1.024	356	42
72869	SBRK G1	1.008	1318	316	72870	SCHILLER	0.000	0	0	72872	SCHILLER	0.000	0	0
72871	SCHILLER	0.000	0	0	72918	L NATION	0.000	0	0	90020	Q166-DIX	1.050	9	1
90030	Q166-OWL	0.000	0	0	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	0.000	0	0	72742	TAMWORTH	0.000	0	0	72758	SMITH HY	0.000	0	0
72812	JACKMAN	1.031	12	0*	72820	NORTH 34	1.032	14	0*	72835	LACONIA	1.009	3	0*
72837	WEBSTER	0.000	0	0*	72840	AYERS	1.032	9	0*	72845	BERLIN	1.014	14	0*
72873	WL JET	1.003	18	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	4	0
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	0.000	0	0	70233	SPRUCEG1	1.017	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	1.043	30	0*
70084	LFCOLL2	1.038	20	0*	88001	Q305-01-	1.050	18	2	88010	Q305-10-	1.050	16	2
88018	Q305-18-	1.050	16	2	88026	Q305-26-	1.050	16	2	70449	OAK HILL	1.033	13	0*
91870	AMPRSND	1.019	13	-4	9568	S01_GEN	1.038	3	0*	9569	S02_GEN	1.037	3	0*
9570	S03_GEN	1.037	3	0*	9571	S04_GEN	0.000	0	0*	9572	S05_GEN	1.037	3	0*
9573	S06_GEN	1.038	3	0*	9574	S07_GEN	1.038	3	0*	9575	S08_GEN	1.037	3	0*
9576	S09_GEN	1.037	3	0*	9577	S10_GEN	1.037	3	0*	9578	S11_GEN	1.037	3	0*
9579	S12_GEN	1.038	3	0*	9921	T01_GEN	1.043	3	0*	9922	T02_GEN	1.044	3	0*
9923	T03_GEN	1.045	3	0*	9924	T04_GEN	1.045	3	0*	9925	T05_GEN	1.046	3	0*
9926	T06_GEN	1.046	3	0*	9927	T07_GEN	1.047	3	0*	155	CPD WINC	1.023	18	-3*
94030	WTG-N6	1.050	2	0	94040	WTG-N1	1.050	2	0	94050	WTG-N2	1.050	2	0
94060	WTG-N3	1.050	2	0	94070	WTG-N4	1.050	2	0	94080	WTG-N5	1.050	2	0
94090	WTG-W1	1.050	2	0	94100	WTG-W2	1.050	2	0	94110	WTG-W3	1.050	2	0
94120	WTG-W4	1.050	2	0	94130	WTG-W5	1.050	2	0	94140	WTG-W6	1.050	2	0
94155	WTG-E2	1.050	2	0	94165	WTG-E3	1.050	2	0	94165	WTG-E3	1.050	2	0
94175	WTG-E6	1.050	2	0	94190	WTG-E5	1.050	2	0	94200	WTG-E4	1.050	2	0
94210	WTG-E7	1.050	2	0	94220	WTG-E8	1.050	2	0	94230	WTG-E9	1.050	2	0
94240	WTG-E10	1.050	2	0	94250	WTG-E11	1.050	2	0	94265	WTG-E12	1.050	2	0
94275	WTG-E13	1.050	2	0										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0	71067	MYS8 GTS	1.005	463	-35	71068	MYS8 ST	0.995	290	-35
71069	MYS9 GTS	0.987	432	-81	71070	MYS9 ST	1.021	290	43	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	1.005	565	-35
71947 SALEM G2	1.018	78	4	71948 SALEM G3	1.013	143	7	71949 SALEM G4	0.000	0	0
72059 LENERG1	1.003	65	-20	72060 LENERG2	1.005	20	-15	71946 SALEM G1	1.018	80	4
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71095 ANPBLCK1	1.074	293	96	71096 ANPBLCK2	0.000	0	0	72377 BELL #1	0.973	273	-100
72378 BELL #2	0.000	0	0	72372 BP #1 GN	0.000	0	0	72375 BP #2 GN	0.000	0	0
72370 BP #3 GN	1.018	437	42	72371 BP #4 GN	0.000	0	0	71531 OSP1 PF	1.032	77	18
71532 OSP2 PF	1.032	77	18	71533 OSP3 PF	1.032	100	23	71534 OSP4 PF	1.032	77	18
71535 OSP5 PF	1.032	77	18	71536 OSP6 PF	1.032	100	23	71084 NEA GTPF	1.040	96	29
71085 NEA GTPF	1.040	96	29	71086 NEA STPF	1.041	80	29	72666 FRSQ SC1	0.991	43	0
72667 FRSQ SC2	0.991	43	-2	72668 FRSQ SC3	0.991	41	-5	72661 MANCH09A	1.013	101	35*
72662 MANCH10A	0.000	0	0	72663 MANCH11A	0.000	0	0	72671 RISEG1CT	1.030	176	43
72672 RISEG3ST	1.028	196	43	72673 RISEG2CT	0.000	0	0	72373 MPLP 1PF	0.000	0	0
72374 MPLP 2PF	1.024	45	12	71251 CANAL G1	1.026	566	172	71252 CANAL G2	0.000	0	0
71094 PLGRM G1	1.019	670	11	71092 EDG ST	0.000	0	0	71093 EDG GTS	0.987	479	-110
71522 SOM G6	0.956	105	0	72669 TIVER G1	0.000	0	0	72670 TIVER G2	0.961	92	-40
71524 DGHTNPWR	1.010	185	30*								

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	826	BRPT-ENERGY	261	90	MIDDLETOWN	117	24
MONTVILLE	81	0	NORWALK	0	0	BPTHBR	192	47
NHHARBOUR	0	0	DEVON	0	0	MERIDEN	0	0
WALLINGFORD	0	0	BERKSHIRE	0	0	LAKEROAD	0	0
STONYBROOK	411	127	MILLENNIUM	273	7	BRAYTONPT	437	42
HOPE	372	87	FRSQ	228	29	SOMERSET	105	0
OSP	510	120	NEA	272	88	CANAL	566	172
PILGRIM	670	11	MASSPWRR	247	65	ANP-BELLINGHAM	273	-100
ANP-BLACKSTONE	293	96	EMI-TIVERTON	92	-40	EMI-DIGHTON	185	30
SITHE-EDGAR	479	-110	MYSTIC	565	-35	NEWBOSTON	0	0
SALEMHBR	301	14	SITHE-MYSTIC	1475	-107	SEABROOK	1318	316
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	0	0
MERRIMACK	469	57	WYMAN	636	135	VTYANKEE	667	150
BEARSWAMP	202	85	NORTHFIELD	540	160	ALTRESCO	146	21
MIS	495	191	AEC	151	80	RPA	272	104
WESTBROOK	537	188	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0	NY	294	288			

INTERFACE FLOWS
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NB-NE	999	-182	ORRING-SOUTH	1178	182	SUROWIEC-SOUTH	1058	-70
MEYANKEE-SOUTH	900	-145	MAINE-NH	1797	-56	NNE-SCOBIE+394	2774	86
SEABROOK-SOUTH	1428	128	NORTH-SOUTH	3015	-132	CMFD/MOORE-SO	268	16
SNDYPOND-SOUTH	1700	-139	CONN-IMPORT	1700	-11	SWCT	1824	-115
NE-NRWLK-STFD	1066	12	BOSTON IMPORT	1478	-545	SEMA/RI EXPORT	1087	-364
SEMA EXPORT	405	-424	EAST-WEST	2337	11	NY-NE 2200(170	-1225	61
NW VT	128	-24	PV20 PAR	100	-7<-11	BLISS PAR	0	-3
CROSS-SOUND	-346	128	LILCO	0	-48	214	130	-4
F206	124	49						

HVDC TRANSFERS FROM H-Q
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PHII-P1 = 500

HIGHGATE = 211
PHII-P2 = 500

BUS VOLTAGES
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	V	LMT			V	LMT			V	LMT	
70001 CHESTER	357.			72692 NWGTN345	357.			72694 SEBRK345	357.		
71789 TEWKS	358.			70759 MYSTIC	360.			71797 MILLBURY	355.		
72925 LUDLOW	351.			72926 NRTHFLD	354.			73106 SOUTHGTN	339.		
73108 CARD	355.			73109 MONTVILE	352.			73110 MILLSTNE	357.		
73116 MIDDLTWN	347.			71801 BRAYTN P	358.			71811 KENT CO.	356.		
71326 BRIDGWTR	357.			71336 SHERMAN	357.			71338 OS POWER	357.		
71337 WFARNUM	357.			70772 W MEDWAY	357.			70780 WWALP345	358.		
70783 PILGRIM	358.			70773 NEA 336	358.			71193 CANAL	359.		
71133 CARVER	359.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	243.	H	
70793 MDFRM230	244.	H		70794 MDWLT230	243.	H		70818 MYSTC MA	119.		
71891 SALEM HR	119.			72096 MILLBURY	118.		0.0	71377 SOMERSET	118.		
72277 MIDWEYMT	117.			72259 MINK 183	118.			72574 WARRN 84	117.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	117.			71379 SWANSEA	118.			72269 WITNPD43	118.		
72278 FIELD 1	117.			72266 READ ST	117.			72267 S WREN29	116.		
72254 DEPOT129	117.			72255 DEPOT130	117.			72582 WOONSCKT	118.		
71403 WFARNUM	118.			72579 WOLF 171	119.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	118.		12.6
72565 KENT CO	118.		75.6 *	72570 SOCK187	117.			72571 SOCK188	117.		
72557 DAVIST85	118.			72559 DAVIS 90	118.			72572 W.KINGST	117.		18.9 *
72538 KENYON	117.			72581 WOOD RIV	117.			70512 ESX B-2	116.		
70487 COOL 345	360.			70520 W RUTLND	117.			73281 EXETR PF	116.		
90000 Q166-POI	117.			72760 POTOK PH	117.			72731 LOST NAT	117.		
72752 WHITEFLD	118.			71838 MOORE	119.			72713 BERLIN	117.		
72729 LITTLTN	119.			72753 WOODSTKH	118.			70496 GRAN 230	233.		
91000 Q229_LINK	117.			72759 PEMI	116.			72712 BEEBE	118.		
94001 Q345 TAP	117.										

AREA/ZONE TOTALS
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ISO-NE_GEN	20437	ISO-NE_LOAD	20778	ISO-NE_LOSS	651	
ISO-NE_INT	-999					
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2006 NPCC LIBRARY
2013 SPRING LIGHT Q345 PRE-PROJECT

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.969	667	150*	73072	ALT12 PF	1.016	65	7	73073	ALT34 PF	1.015	81	7
72986	BERKPWR	0.000	0	0	73069	MAPR1 PF	0.000	0	0	73070	MAPR2 PF	0.994	89	7
73071	MAPR3 PF	0.996	83	7	73085	MT.TOM	1.004	146	0	72512	BRSWP G1	0.968	-284	62
72513	BRSWP G2	0.968	-284	62	73083	NRTHFD3	0.993	-250	80*	73033	NRTHFLD1	0.000	0	0
73034	NRTHFLD2	0.000	0	0	73084	NRTHFD4	0.000	0	0	72930	STNYBK1A	0.000	0	0
72931	STNYBK1B	0.000	0	0	72932	STNYBK1C	0.000	0	0	72933	STNYBK 1	0.000	0	0
72934	STNYBK2A	0.000	0	0	72935	STNYBK2B	0.000	0	0	73080	WSPFLD 3	1.016	107	14
72244	MILLENST	0.000	0	0	72243	MILLENCT	0.000	0	0	70479	SHFLDWND	1.001	30	0*
70480	SHFDWND2	0.998	10	0*	70644	VPPSA	1.030	48	1	70712	ESSEX 19	1.035	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	0.997	940	182	73563	MILL#3	0.998	1260	241	73558	MONTV#5	0.000	0	0
73559	MONTV#6	0.000	0	0	73555	MIDDTN#2	0.000	0	0	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	0.000	0	0	73566	LAKERD#2	0.000	0	0
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	0.000	0	0	73550	SMD1314J	0.000	0	0
73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0	73596	WALL LV3	0.000	0	0
73538	AESTH PF	0.000	0	0	73652	BE 11	0.000	0	0	73653	BE 12	0.000	0	0
73654	BE 10 ST	0.897	180	-60	73647	BPTHBR#2	0.000	0	0	73648	BPTHBR#3	0.000	0	0
73570	DEVGAS11	0.000	0	0	73571	DEVGAS12	0.000	0	0	73572	DEVGAS13	0.000	0	0
73573	DEVGAS14	0.000	0	0	73553	DEVON#7	0.000	0	0	73554	DEVON#8	0.000	0	0
73574	MILFD#1	0.000	0	0	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.972	447	0
73551	NORHAR#1	0.000	0	0	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.030	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.004	157	28*	70061	MIS GT2	1.006	158	32*	70062	MIS ST	1.005	0	25*
70377	AEC G1	0.000	0	0	70378	AEC G2	0.000	0	0	70379	AEC G3	0.000	0	0
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.000	0	0	70424	CHAMP G3	0.000	0	0
70425	MEADCOGN	1.026	110	34*	70381	RPA CG1	1.051	179	56	70382	RPA SG2	1.057	93	30
70422	WARRN G1	1.000	50	1	70423	WARRN G2	0.000	0	0	70386	WBK G1	1.004	184	24
70387	WBK G2	1.004	184	24	70388	WBK G3	1.004	187	25	70365	WF WY #1	0.000	0	0
70366	WF WY #2	0.000	0	0	70367	WF WY #3	0.000	0	0	70368	WF WY #4	0.000	0	0
71857	COMRF G1	1.020	24	6	71858	COMRF G2	1.017	48	6	71859	COMRF G3	1.017	48	6
71860	COMRF G4	1.017	48	6	71861	MOORE G1	1.006	48	1	71862	MOORE G2	1.007	48	1
71863	MOORE G3	0.998	48	1	71864	MOORE G4	1.005	48	1	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.017	169	76	72703	CONEDG2	1.017	169	76	72704	CONEDG3	0.000	0	0
71950	GRANRDG1	0.000	0	0	71951	GRANRDG2	0.000	0	0	72701	AESSTG	0.000	0	0
72760	POTOK PH	0.000	0	0	72866	MERMK G1	0.000	0	0	72867	MERMK G2	0.000	0	0
72869	SBRK G1	1.012	1318	375*	72870	SCHILLER	0.000	0	0	72872	SCHILLER	0.000	0	0
72871	SCHILLER	0.000	0	0	72918	L NATION	0.000	0	0	90020	Q166-DIX	1.050	12	0
90030	Q166-OWL	0.000	0	0	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	1.023	15	0*	72742	TAMWORTH	1.021	20	0*	72758	SMITH HY	0.000	0	0*
72812	JACKMAN	1.035	12	0*	72820	NORTH 34	1.035	14	0*	72835	LACONIA	1.007	3	0*
72837	WEBSTER	1.024	6	0*	72840	AYERS	1.026	9	0*	72845	BERLIN	1.011	14	0*
72873	WL JET	0.000	0	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	17	2
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	1.011	3	0*	70233	SPRUCEG1	1.022	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	0.000	0	0*
70084	LFCOLL2	0.000	0	0*	88001	Q305-01-	0.000	0	0*	88010	Q305-10-	0.000	0	0*
88018	Q305-18-	0.000	0	0*	88026	Q305-26-	0.000	0	0*	70449	OAK HILL	1.038	26	0*
91870	AMPRSND	1.026	13	-4	9568	S01_GEN	1.033	3	0*	9569	S02_GEN	1.033	3	0*
9570	S03_GEN	1.032	3	0*	9571	S04_GEN	0.000	0	0*	9572	S05_GEN	0.000	0	0*
9573	S06_GEN	0.000	0	0*	9574	S07_GEN	0.000	0	0*	9575	S08_GEN	0.000	0	0*
9576	S09_GEN	0.000	0	0*	9577	S10_GEN	0.000	0	0*	9578	S11_GEN	0.000	0	0*
9579	S12_GEN	0.000	0	0*	9921	T01_GEN	1.023	3	0*	9922	T02_GEN	1.024	3	0*
9923	T03_GEN	1.025	3	0*	9924	T04_GEN	1.025	3	0*	9925	T05_GEN	1.026	3	0*
9926	T06_GEN	1.027	3	0*	9927	T07_GEN	1.027	3	0*	155	CPD WINC	1.023	18	-3*
94030		0.000	0	0*	94040		0.000	0	0*	94050		0.000	0	0*
94060		0.000	0	0*	94070		0.000	0	0*	94080		0.000	0	0*
94090		0.000	0	0*	94100		0.000	0	0*	94110		0.000	0	0*
94120		0.000	0	0*	94130		0.000	0	0*	94140		0.000	0	0*
94155		0.000	0	0*	94165		0.000	0	0*	94165		0.000	0	0*
94175		0.000	0	0*	94190		0.000	0	0*	94200		0.000	0	0*
94210		0.000	0	0*	94220		0.000	0	0*	94230		0.000	0	0*
94240		0.000	0	0*	94250		0.000	0	0*	94265		0.000	0	0*
94275		0.000	0	0*										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0*	71067	MYS8 GTS	0.972	476	-100	71068	MYS8 ST	0.000	0	0
71069	MYS9 GTS	0.000	0	0	71070	MYS9 ST	0.000	0	0	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	0.974	107	-150
71947 SALEM G2	0.987	78	-8	71948 SALEM G3	0.976	143	-37	71949 SALEM G4	0.967	360	-128
72059 LENERG1	1.012	65	-4	72060 LENERG2	1.019	20	-2	71946 SALEM G1	0.981	81	-21
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71095	ANPBLCK1	0.000	0	0	71096	ANPBLCK2	0.000	0	0	72377	BELL #1	0.963	289	-100
72378	BELL #2	0.000	0	0	72372	BP #1 GN	0.993	241	5	72375	BP #2 GN	0.993	241	5
72370	BP #3 GN	1.028	428	79	72371	BP #4 GN	1.028	425	59	71531	OSP1 PF	0.999	77	0
71532	OSP2 PF	0.999	77	0	71533	OSP3 PF	0.000	0	0	71534	OSP4 PF	0.000	0	0
71535	OSP5 PF	0.999	77	0	71536	OSP6 PF	0.000	0	0	71084	NEA GTPF	0.997	111	0
71085	NEA GTPF	0.000	0	0	71086	NEA STPF	0.000	0	0	72666	FRSQ SC1	0.000	0	0
72667	FRSQ SC2	0.000	0	0	72668	FRSQ SC3	0.000	0	0	72661	MANCH09A	0.000	0	0
72662	MANCH10A	0.000	0	0	72663	MANCH11A	0.000	0	0	72671	RISE G1	0.000	0	0
72672	RISE G2	0.000	0	0	72673	RISE G3	0.000	0	0	72373	MPLP 1PF	0.000	0	0
72374	MPLP 2PF	0.000	0	0	71251	CANAL G1	0.957	566	-50	71252	CANAL G2	0.000	0	0
71094	PLGRM G1	1.036	670	135	71092	EDG ST	0.000	0	0	71093	EDG GTS	0.000	0	0
71522	SOM G6	0.000	0	0	72669	TIVER G1	0.000	0	0	72670	TIVER G2	0.000	0	0
71524	DGHTNPWR	0.000	0	0										

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	423	BRPT-ENERGY	180	-60	MIDDLETOWN	0	0
MONTVILLE	0	0	NORWALK	0	0	BPTHBR	0	0
NHHARBOUR	447	0	DEVON	0	0	MERIDEN	0	0
WALLINGFORD	0	0	BERKSHIRE	0	0	LAKEROAD	0	0
STONYBROOK	0	0	MILLENNIUM	0	0	BRAYTONPT	1335	149
HOPE	0	0	FRSQ	0	0	SOMERSET	0	0
OSP	232	0	NEA	111	0	CANAL	566	-50
PILGRIM	670	135	MASSPWRR	172	14	ANP-BELLINGHAM	289	-100
ANP-BLACKSTONE	0	0	EMI-TIVERTON	0	0	EMI-DIGHTON	0	0
SITHE-EDGAR	0	0	MYSTIC	107	-150	NEWBOSTON	0	0
SALEMHBR	662	-195	SITHE-MYSTIC	476	-100	SEABROOK	1318	375
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	0	0
MERRIMACK	0	0	WYMAN	0	0	VTYANKEE	667	150
BEARSWAMP	-568	123	NORTHFIELD	-250	80	ALTRESCO	146	14
MIS	315	84	AEC	0	0	RPA	272	86
WESTBROOK	555	72	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0						

INTERFACE FLOWS
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NB-NE	1001	-28	ORRING-SOUTH	1151	-522	SUROWIEC-SOUTH	1039	-89
MEYANKEE-SOUTH	893	-249	MAINE-NH	1560	-75	NNE-SCOBIE+394	2612	207
SEABROOK-SOUTH	1396	206	NORTH-SOUTH	3229	-100	CMFD/MOORE-SO	380	34
SNDYPOND-SOUTH	796	-162	CONN-IMPORT	471	4	SWCT	643	-130
NE-NRWLK-STFD	32	121	BOSTON IMPORT	1050	-644	SEMA/RI EXPORT	1403	-575
SEMA EXPORT	575	-609	EAST-WEST	2269	-10	NY-NE 2200(170	-1245	187
NW VT	45	14	PV20 PAR	101	9<-20	BLISS PAR	-1	-2
CROSS-SOUND	-351	86	LILCO	0	-18	214	119	-13
F206	127	32						

HVDC TRANSFERS FROM H-Q
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CHAT-1 = 0		HIGHGATE = 194
MADAWASK = 0	PHII-P1 = 0	PHII-P2 = 0
EEL = 0		

BUS VOLTAGES
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	V	LMT			V	LMT			V	LMT	
70001 CHESTER	342.			72692 NWGTN345	357.			72694 SEBRK345	357.		
71789 TEWKS	353.			70759 MYSTIC	353.			71797 MILLBURY	353.		
72925 LUDLOW	350.			72926 NRTHFLD	349.			73106 SOUTHGTN	351.		
73108 CARD	355.			73109 MONTVILE	355.			73110 MILLSTNE	357.		
73116 MIDDLTWN	353.			71801 BRAYTN P	359.			71811 KENT CO.	355.		
71326 BRIDGWTR	356.			71336 SHERMAN	355.			71338 OS POWER	355.		
71337 WFARNUM	356.			70772 W MEDWAY	354.			70780 WWALP345	355.		
70783 PILGRIM	358.			70773 NEA 336	354.			71193 CANAL	356.		
71133 CARVER	357.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	237.		
70793 MDFRM230	240.			70794 MDWLT230	240.			70818 MYSTC MA	118.		
71891 SALEM HR	117.			72096 MILLBURY	118.		63.0 *	71377 SOMERSET	120.		
72277 MIDWEYMT	117.			72259 MINK 183	119.			72574 WARRN 84	118.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	119.			71379 SWANSEA	119.			72269 WITNPD43	118.		
72278 FIELD 1	117.			72266 READ ST	119.			72267 S WREN29	118.		
72254 DEPOT129	118.			72255 DEPOT130	118.			72582 WOONSCKT	119.		
71403 WFARNUM	119.			72579 WOLF 171	119.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	119.		0.0
72565 KENT CO	119.		0.0	72570 SOCK187	118.			72571 SOCK188	118.		
72557 DAVIST85	119.			72559 DAVIS 90	119.			72572 W.KINGST	120.		0.0
72538 KENYON	120.			72581 WOOD RIV	120.			70512 ESX B-2	116.		
70487 COOL 345	352.			70520 W RUTLND	118.			73281 EXETR PF	118.		
90000 Q166-POI	118.			72760 POTOK PH	118.			72731 LOST NAT	118.		
72752 WHITEFLD	119.			71838 MOORE	119.			72713 BERLIN	118.		
72729 LITTLTN	119.			72753 WOODSTKH	118.			70496 GRAN 230	232.		
91000 Q229_LINK	118.			72759 PEMI	117.			72712 BEEBE	117.		
94001 Q345 115 2	0.	*E									

AREA/ZONE TOTALS
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NEPOOL_GEN	13085	NEPOOL_LOAD	12396	NEPOOL_LOSS	479
NEPOOL_INT	202				
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2006 NPCC LIBRARY
2013 SPRING LIGHT Q345 POST-PROJECT POI-1

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.969	667	150*	73072	ALT12 PF	1.016	65	7	73073	ALT34 PF	1.015	81	7
72986	BERKPWR	0.000	0	0	73069	MAPR1 PF	0.000	0	0	73070	MAPR2 PF	0.994	89	7
73071	MAPR3 PF	0.996	83	7	73085	MT.TOM	1.004	146	0	72512	BRSWP G1	0.968	-284	62
72513	BRSWP G2	0.968	-284	62	73083	NRTHFD3	0.993	-250	80*	73033	NRTHFLD1	0.000	0	0
73034	NRTHFLD2	0.000	0	0	73084	NRTHFD4	0.000	0	0	72930	STNYBK1A	0.000	0	0
72931	STNYBK1B	0.000	0	0	72932	STNYBK1C	0.000	0	0	72933	STNYBK 1	0.000	0	0
72934	STNYBK2A	0.000	0	0	72935	STNYBK2B	0.000	0	0	73080	WSPFLD 3	1.016	107	14
72244	MILLENST	0.000	0	0	72243	MILLENCT	0.000	0	0	70479	SHFLDWND	1.002	30	0*
70480	SHFDWND2	0.999	10	0*	70644	VPPSA	1.030	48	1	70712	ESSEX 19	1.035	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	0.997	940	182	73563	MILL#3	0.998	1260	241	73558	MONTV#5	0.000	0	0
73559	MONTV#6	0.000	0	0	73555	MIDDTN#2	0.000	0	0	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	0.000	0	0	73566	LAKERD#2	0.000	0	0
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	0.000	0	0	73550	SMD1314J	0.000	0	0
73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0	73596	WALL LV3	0.000	0	0
73538	AESTH PF	0.000	0	0	73652	BE 11	0.000	0	0	73653	BE 12	0.000	0	0
73654	BE 10 ST	0.897	180	-60	73647	BPTHBR#2	0.000	0	0	73648	BPTHBR#3	0.000	0	0
73570	DEVGAS11	0.000	0	0	73571	DEVGAS12	0.000	0	0	73572	DEVGAS13	0.000	0	0
73573	DEVGAS14	0.000	0	0	73553	DEVON#7	0.000	0	0	73554	DEVON#8	0.000	0	0
73574	MILFD#1	0.000	0	0	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.972	447	0
73551	NORHAR#1	0.000	0	0	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.030	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.004	157	28*	70061	MIS GT2	1.007	158	32*	70062	MIS ST	1.005	0	25*
70377	AEC G1	0.000	0	0	70378	AEC G2	0.000	0	0	70379	AEC G3	0.000	0	0
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.000	0	0	70424	CHAMP G3	0.000	0	0
70425	MEADCOGN	1.026	110	34*	70381	RPA CG1	1.050	179	55	70382	RPA SG2	1.057	93	30
70422	WARRN G1	1.000	50	1	70423	WARRN G2	0.000	0	0	70386	WBK G1	1.004	184	24
70387	WBK G2	1.004	184	24	70388	WBK G3	1.004	187	24	70365	WF WY #1	0.000	0	0
70366	WF WY #2	0.000	0	0	70367	WF WY #3	0.000	0	0	70368	WF WY #4	0.000	0	0
71857	COMRF G1	1.019	24	5	71858	COMRF G2	1.016	48	5	71859	COMRF G3	1.016	48	5
71860	COMRF G4	1.016	48	5	71861	MOORE G1	1.007	48	1	71862	MOORE G2	1.007	48	1
71863	MOORE G3	0.998	48	1	71864	MOORE G4	1.005	48	1	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.017	169	75	72703	CONEDG2	1.017	169	75	72704	CONEDG3	0.000	0	0
71950	GRANRDG1	0.000	0	0	71951	GRANRDG2	0.000	0	0	72701	AESSTG	0.000	0	0
72760	POTOK PH	0.000	0	0	72866	MERMK G1	0.000	0	0	72867	MERMK G2	0.000	0	0
72869	SBRK G1	1.012	1318	375*	72870	SCHILLER	0.000	0	0	72872	SCHILLER	0.000	0	0
72871	SCHILLER	0.000	0	0	72918	L NATION	0.000	0	0	90020	Q166-DIX	1.050	12	0
90030	Q166-OWL	0.000	0	0	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	0.000	0	0	72742	TAMWORTH	0.000	0	0	72758	SMITH HY	0.000	0	0
72812	JACKMAN	1.036	12	0*	72820	NORTH 34	1.037	14	0*	72835	LACONIA	1.014	3	0*
72837	WEBSTER	1.027	6	0*	72840	AYERS	1.029	9	0*	72845	BERLIN	1.013	14	0*
72873	WL JET	0.000	0	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	4	0
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	1.013	3	0*	70233	SPRUCEG1	1.022	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	0.000	0	0*
70084	LFCOLL2	0.000	0	0*	88001	Q305-01-	0.000	0	0*	88010	Q305-10-	0.000	0	0*
88018	Q305-18-	0.000	0	0*	88026	Q305-26-	0.000	0	0*	70449	OAK HILL	1.039	26	0*
91870	AMPRSND	1.026	13	-4	9568	S01_GEN	1.033	3	0*	9569	S02_GEN	1.033	3	0*
9570	S03_GEN	1.032	3	0*	9571	S04_GEN	0.000	0	0*	9572	S05_GEN	0.000	0	0*
9573	S06_GEN	0.000	0	0*	9574	S07_GEN	0.000	0	0*	9575	S08_GEN	0.000	0	0*
9576	S09_GEN	0.000	0	0*	9577	S10_GEN	0.000	0	0*	9578	S11_GEN	0.000	0	0*
9579	S12_GEN	0.000	0	0*	9921	T01_GEN	1.023	3	0*	9922	T02_GEN	1.024	3	0*
9923	T03_GEN	1.025	3	0*	9924	T04_GEN	1.026	3	0*	9925	T05_GEN	1.026	3	0*
9926	T06_GEN	1.027	3	0*	9927	T07_GEN	1.027	3	0*	155	CPD WINC	1.029	18	-3*
94030	WTG-N6	1.050	2	0	94040	WTG-N1	1.050	2	0	94050	WTG-N2	1.050	2	0
94060	WTG-N3	1.050	2	0	94070	WTG-N4	1.050	2	0	94080	WTG-N5	1.050	2	0
94090	WTG-W1	1.050	2	0	94100	WTG-W2	1.050	2	0	94110	WTG-W3	1.050	2	0
94120	WTG-W4	1.050	2	0	94130	WTG-W5	1.050	2	0	94140	WTG-W6	1.050	2	0
94155	WTG-E2	1.050	2	0	94165	WTG-E3	1.050	2	0	94165	WTG-E3	1.050	2	0
94175	WTG-E6	1.050	2	0	94190	WTG-E5	1.050	2	0	94200	WTG-E4	1.050	2	0
94210	WTG-E7	1.050	2	0	94220	WTG-E8	1.050	2	0	94230	WTG-E9	1.050	2	0
94240	WTG-E10	1.050	2	0	94250	WTG-E11	1.050	2	0	94265	WTG-E12	1.050	2	0
94275	WTG-E13	1.050	2	0										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0	71067	MYS8 GTS	0.972	476	-100	71068	MYS8 ST	0.000	0	0
71069	MYS9 GTS	0.000	0	0	71070	MYS9 ST	0.000	0	0	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	0.974	107	-150
71947 SALEM G2	0.987	78	-8	71948 SALEM G3	0.976	143	-37	71949 SALEM G4	0.967	360	-129
72059 LENERG1	1.012	65	-5	72060 LENERG2	1.019	20	-2	71946 SALEM G1	0.981	81	-21
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#	V	MW	MX	#	V	MW	MX	#	V	MW	MX
71095 ANPBLCK1	0.000	0	0	71096 ANPBLCK2	0.000	0	0	72377 BELL #1	0.963	289	-100
72378 BELL #2	0.000	0	0	72372 BP #1 GN	0.993	241	5	72375 BP #2 GN	0.993	241	5
72370 BP #3 GN	1.028	428	79	72371 BP #4 GN	1.028	425	59	71531 OSP1 PF	0.999	77	0
71532 OSP2 PF	0.999	77	0	71533 OSP3 PF	0.000	0	0	71534 OSP4 PF	0.000	0	0
71535 OSP5 PF	0.999	77	0	71536 OSP6 PF	0.000	0	0	71084 NEA GTPF	0.997	111	0
71085 NEA GTPF	0.000	0	0	71086 NEA STPF	0.000	0	0	72666 FRSQ SC1	0.000	0	0
72667 FRSQ SC2	0.000	0	0	72668 FRSQ SC3	0.000	0	0	72661 MANCH09A	0.000	0	0
72662 MANCH10A	0.000	0	0	72663 MANCH11A	0.000	0	0	72671 RISE G1	0.000	0	0
72672 RISE G2	0.000	0	0	72673 RISE G3	0.000	0	0	72373 MPLP 1PF	0.000	0	0
72374 MPLP 2PF	0.000	0	0	71251 CANAL G1	0.957	566	-50	71252 CANAL G2	0.000	0	0
71094 PLGRM G1	1.036	670	135	71092 EDG ST	0.000	0	0	71093 EDG GTS	0.000	0	0
71522 SOM G6	0.000	0	0	72669 TIVER G1	0.000	0	0	72670 TIVER G2	0.000	0	0
71524 DGHTNPWR	0.000	0	0								

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	423	BRPT-ENERGY	180	-60	MIDDLETOWN	0	0
MONTVILLE	0	0	NORWALK	0	0	BPTHBR	0	0
NHHARBOUR	447	0	DEVON	0	0	MERIDEN	0	0
WALLINGFORD	0	0	BERKSHIRE	0	0	LAKEROAD	0	0
STONYBROOK	0	0	MILLENNIUM	0	0	BRAYTONPT	1335	149
HOPE	0	0	FRSQ	0	0	SOMERSET	0	0
OSP	232	0	NEA	111	0	CANAL	566	-50
PILGRIM	670	135	MASSPWRR	172	14	ANP-BELLINGHAM	289	-100
ANP-BLACKSTONE	0	0	EMI-TIVERTON	0	0	EMI-DIGHTON	0	0
SITHE-EDGAR	0	0	MYSTIC	107	-150	NEWBOSTON	0	0
SALEMHBR	662	-195	SITHE-MYSTIC	476	-100	SEABROOK	1318	375
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	0	0
MERRIMACK	0	0	WYMAN	0	0	VTYANKEE	667	150
BEARSWAMP	-568	123	NORTHFIELD	-250	80	ALTRESCO	146	14
MIS	315	84	AEC	0	0	RPA	272	85
WESTBROOK	555	72	BUCKSPORT	0	0	EXETRTIRE	0	0
EXETRWIND	0	0						

INTERFACE FLOWS

NB-NE	1001	-28	ORRING-SOUTH	1151	-522	SUROWIEC-SOUTH	1039	-89
MEYANKEE-SOUTH	893	-249	MAINE-NH	1560	-77	NNE-SCOBIE+394	2612	207
SEABROOK-SOUTH	1396	206	NORTH-SOUTH	3227	-99	CMFD/MOORE-SO	380	31
SNDYPOND-SOUTH	795	-162	CONN-IMPORT	470	4	SWCT	642	-130
NE-NRWLK-STFD	30	121	BOSTON IMPORT	1050	-644	SEMA/RI EXPORT	1403	-576
SEMA EXPORT	575	-609	EAST-WEST	2267	-9	NY-NE 2200(170	-1245	187
NW VT	45	14	PV20 PAR	100	9<-20	BLISS PAR	0	-2
CROSS-SOUND	-351	86	LILCO	0	-18	214	119	-14
F206	128	32						

HVDC TRANSFERS FROM H-Q

CHAT-1 = 0		HIGHGATE = 194
MADAWASK = 0	PHII-P1 = 0	PHII-P2 = 0
EEL = 0		

BUS VOLTAGES

	V	LMT		V	LMT		V	LMT	
70001 CHESTER	342.		72692 NWGTN345	357.		72694 SEBRK345	357.		
71789 TEWKS	353.		70759 MYSTIC	353.		71797 MILLBURY	353.		
72925 LUDLOW	350.		72926 NRTHFLD	349.		73106 SOUTHGTN	351.		
73108 CARD	355.		73109 MONTVILE	355.		73110 MILLSTNE	357.		
73116 MIDDLTWN	353.		71801 BRAYTN P	359.		71811 KENT CO.	355.		
71326 BRIDGWTR	356.		71336 SHERMAN	355.		71338 OS POWER	355.		
71337 WFARNUM	356.		70772 W MEDWAY	354.		70780 WWALP345	355.		
70783 PILGRIM	358.		70773 NEA 336	354.		71193 CANAL	356.		
71133 CARVER	357.		70655 SHELBRNE	116.	L	70795 FRMNGHAM	237.		
70793 MDFRM230	240.		70794 MDWLT230	240.		70818 MYSTC MA	118.		
71891 SALEM HR	117.		72096 MILLBURY	118.	63.0 *	71377 SOMERSET	120.		
72277 MIDWEYMT	117.		72259 MINK 183	119.		72574 WARRN 84	118.		
72569 FRSQ	119.	0.0	72566 PHILP183	119.		72553 ADMIRAL3	119.		
71405 PAWTUCKT	119.		71379 SWANSEA	119.		72269 WITNPD43	118.		
72278 FIELD 1	117.		72266 READ ST	119.		72267 S WREN29	118.		
72254 DEPOT129	118.		72255 DEPOT130	118.		72582 WOONSCKT	119.		
71403 WFARNUM	119.		72579 WOLF 171	119.		72584 HARTAVE	119.		
72544 JOHNSTN1	119.	0.0	72545 JOHNSTN2	119.	0.0	72560 DRUMROCK	119.		0.0
72565 KENT CO	119.	0.0	72570 SOCK187	118.		72571 SOCK188	118.		
72557 DAVIST85	119.		72559 DAVIS 90	119.		72572 W.KINGST	120.		0.0
72538 KENYON	120.		72581 WOOD RIV	120.		70512 ESX B-2	116.		
70487 COOL 345	352.		70520 W RUTLND	118.		73281 EXETR PF	118.		
90000 Q166-POI	119.		72760 POTOK PH	119.		72731 LOST NAT	119.		
72752 WHITEFLD	119.		71838 MOORE	119.		72713 BERLIN	118.		
72729 LITTLTN	119.		72753 WOODSTKH	119.		70496 GRAN 230	232.		
91000 Q229_LINK	118.		72759 PEMI	117.		72712 BEEBE	118.		
94001 Q345 115 2	0.	*E							

AREA/ZONE TOTALS

NEPOOL_GEN	13085	NEPOOL_LOAD	12396	NEPOOL_LOSS	481	
NEPOOL_INT	201					
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2013 SPRING LIGHT Q345 POST-PROJECT POI-2

GENERATION

~~~VT/MA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70705	VTYAK G	0.969	667	150*	73072	ALT12 PF	1.016	65	7	73073	ALT34 PF	1.015	81	7
72986	BERKPWR	0.000	0	0	73069	MAPR1 PF	0.000	0	0	73070	MAPR2 PF	0.994	89	7
73071	MAPR3 PF	0.996	83	7	73085	MT.TOM	1.004	146	0	72512	BRSWP G1	0.968	-284	62
72513	BRSWP G2	0.968	-284	62	73083	NRTHFD3	0.993	-250	80*	73033	NRTHFLD1	0.000	0	0
73034	NRTHFLD2	0.000	0	0	73084	NRTHFD4	0.000	0	0	72930	STNYBK1A	0.000	0	0
72931	STNYBK1B	0.000	0	0	72932	STNYBK1C	0.000	0	0	72933	STNYBK 1	0.000	0	0
72934	STNYBK2A	0.000	0	0	72935	STNYBK2B	0.000	0	0	73080	WSPFLD 3	1.016	107	14
72244	MILLENST	0.000	0	0	72243	MILLENCT	0.000	0	0	70479	SHFLDWND	1.002	30	0*
70480	SHFDWND2	0.999	10	0*	70644	VPPSA	1.030	48	1	70712	ESSEX 19	1.035	8	0

~~~CT~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
73562	MILL#2	0.997	940	182	73563	MILL#3	0.998	1260	241	73558	MONTV#5	0.000	0	0
73559	MONTV#6	0.000	0	0	73555	MIDDTN#2	0.000	0	0	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73565	LAKERD#1	0.000	0	0	73566	LAKERD#2	0.000	0	0
73567	LAKERD#3	0.000	0	0	73549	SMD1112J	0.000	0	0	73550	SMD1314J	0.000	0	0
73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0	73596	WALL LV3	0.000	0	0
73538	AESTH PF	0.000	0	0	73652	BE 11	0.000	0	0	73653	BE 12	0.000	0	0
73654	BE 10 ST	0.897	180	-60	73647	BPTHBR#2	0.000	0	0	73648	BPTHBR#3	0.000	0	0
73570	DEVGAS11	0.000	0	0	73571	DEVGAS12	0.000	0	0	73572	DEVGAS13	0.000	0	0
73573	DEVGAS14	0.000	0	0	73553	DEVON#7	0.000	0	0	73554	DEVON#8	0.000	0	0
73574	MILFD#1	0.000	0	0	73575	MILFD#2	0.000	0	0	73651	NH HARBR	0.972	447	0
73551	NORHAR#1	0.000	0	0	73552	NORHAR#2	0.000	0	0	73281	EXETR PF	1.030	26	-8

~~~ME/NH~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
70060	MIS GT1	1.004	157	28*	70061	MIS GT2	1.007	158	32*	70062	MIS ST	1.005	0	25*
70377	AEC G1	0.000	0	0	70378	AEC G2	0.000	0	0	70379	AEC G3	0.000	0	0
70389	BUCKS G4	0.000	0	0	70426	CHAMP G2	0.000	0	0	70424	CHAMP G3	0.000	0	0
70425	MEADCOGN	1.026	110	34*	70381	RPA CG1	1.050	179	55	70382	RPA SG2	1.057	93	30
70422	WARRN G1	1.000	50	1	70423	WARRN G2	0.000	0	0	70386	WBK G1	1.004	184	24
70387	WBK G2	1.004	184	24	70388	WBK G3	1.004	187	24	70365	WF WY #1	0.000	0	0
70366	WF WY #2	0.000	0	0	70367	WF WY #3	0.000	0	0	70368	WF WY #4	0.000	0	0
71857	COMRF G1	1.018	24	5	71858	COMRF G2	1.015	48	5	71859	COMRF G3	1.015	48	5
71860	COMRF G4	1.015	48	5	71861	MOORE G1	1.007	48	1	71862	MOORE G2	1.007	48	1
71863	MOORE G3	0.998	48	1	71864	MOORE G4	1.005	48	1	72868	NWNGT G1	0.000	0	0
72702	CONEDG1	1.016	169	75	72703	CONEDG2	1.016	169	75	72704	CONEDG3	0.000	0	0
71950	GRANRDG1	0.000	0	0	71951	GRANRDG2	0.000	0	0	72701	AESSTG	0.000	0	0
72760	POTOK PH	0.000	0	0	72866	MERMK G1	0.000	0	0	72867	MERMK G2	0.000	0	0
72869	SBRK G1	1.012	1318	375*	72870	SCHILLER	0.000	0	0	72872	SCHILLER	0.000	0	0
72871	SCHILLER	0.000	0	0	72918	L NATION	0.000	0	0	90020	Q166-DIX	1.050	12	0
90030	Q166-OWL	0.000	0	0	90040	Q166-FIS	0.000	0	0	72844	WHITEFLD	0.000	0	0
72831	BRIDGEWA	0.000	0	0	72742	TAMWORTH	0.000	0	0	72758	SMITH HY	0.000	0	0
72812	JACKMAN	1.036	12	0*	72820	NORTH 34	1.037	14	0*	72835	LACONIA	1.015	3	0*
72837	WEBSTER	1.028	6	0*	72840	AYERS	1.030	9	0*	72845	BERLIN	1.014	14	0*
72873	WL JET	0.000	0	0*	91005	Q229_MAI	0.000	0	0*	774	Q220	1.030	4	0
92005	Q251_MAI	0.000	0	0	93000	3.3 MW W	1.014	3	0*	70233	SPRUCEG1	1.022	20	0*
73805	RHWCOLL1	0.000	0	0*	73808	RHWCOLL2	0.000	0	0*	70082	LFCOLL1	0.000	0	0*
70084	LFCOLL2	0.000	0	0*	88001	Q305-01-	0.000	0	0*	88010	Q305-10-	0.000	0	0*
88018	Q305-18-	0.000	0	0*	88026	Q305-26-	0.000	0	0*	70449	OAK HILL	1.040	26	0*
91870	AMPRSND	1.026	13	-4	9568	S01_GEN	1.033	3	0*	9569	S02_GEN	1.033	3	0*
9570	S03_GEN	1.032	3	0*	9571	S04_GEN	0.000	0	0*	9572	S05_GEN	0.000	0	0*
9573	S06_GEN	0.000	0	0*	9574	S07_GEN	0.000	0	0*	9575	S08_GEN	0.000	0	0*
9576	S09_GEN	0.000	0	0*	9577	S10_GEN	0.000	0	0*	9578	S11_GEN	0.000	0	0*
9579	S12_GEN	0.000	0	0*	9921	T01_GEN	1.023	3	0*	9922	T02_GEN	1.024	3	0*
9923	T03_GEN	1.025	3	0*	9924	T04_GEN	1.026	3	0*	9925	T05_GEN	1.026	3	0*
9926	T06_GEN	1.027	3	0*	9927	T07_GEN	1.027	3	0*	155	CPD WINC	1.029	18	-3*
94030	WTG-N6	1.050	2	0	94040	WTG-N1	1.050	2	0	94050	WTG-N2	1.050	2	0
94060	WTG-N3	1.050	2	0	94070	WTG-N4	1.050	2	0	94080	WTG-N5	1.050	2	0
94090	WTG-W1	1.050	2	0	94100	WTG-W2	1.050	2	0	94110	WTG-W3	1.050	2	0
94120	WTG-W4	1.050	2	0	94130	WTG-W5	1.050	2	0	94140	WTG-W6	1.050	2	0
94155	WTG-E2	1.050	2	0	94165	WTG-E3	1.050	2	0	94165	WTG-E3	1.050	2	0
94175	WTG-E6	1.050	2	0	94190	WTG-E5	1.050	2	0	94200	WTG-E4	1.050	2	0
94210	WTG-E7	1.050	2	0	94220	WTG-E8	1.050	2	0	94230	WTG-E9	1.050	2	0
94240	WTG-E10	1.050	2	0	94250	WTG-E11	1.050	2	0	94265	WTG-E12	1.050	2	0
94275	WTG-E13	1.050	2	0										

~~~NEMA~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71126	KEND CT	0.000	0	0	71067	MYS8 GTS	0.972	476	-100	71068	MYS8 ST	0.000	0	0
71069	MYS9 GTS	0.000	0	0	71070	MYS9 ST	0.000	0	0	71060	MYST G4	0.000	0	0

71061 MYST 5G	0.000	0	0	71062 MYST G6	0.000	0	0	71063 MYST G7	0.974	107	-150
71947 SALEM G2	0.987	78	-8	71948 SALEM G3	0.976	143	-37	71949 SALEM G4	0.967	360	-129
72059 LENERG1	1.012	65	-5	72060 LENERG2	1.019	20	-2	71946 SALEM G1	0.981	81	-21
71073 N.BOST 1	0.000	0	0								

~~~SEMA/RI~~~

#		V	MW	MX	#		V	MW	MX	#		V	MW	MX
71095	ANPBLCK1	0.000	0	0	71096	ANPBLCK2	0.000	0	0	72377	BELL #1	0.963	289	-100
72378	BELL #2	0.000	0	0	72372	BP #1 GN	0.993	241	5	72375	BP #2 GN	0.993	241	5
72370	BP #3 GN	1.028	428	79	72371	BP #4 GN	1.028	425	59	71531	OSP1 PF	0.999	77	0
71532	OSP2 PF	0.999	77	0	71533	OSP3 PF	0.000	0	0	71534	OSP4 PF	0.000	0	0
71535	OSP5 PF	0.999	77	0	71536	OSP6 PF	0.000	0	0	71084	NEA GTPF	0.997	111	0
71085	NEA GTPF	0.000	0	0	71086	NEA STPF	0.000	0	0	72666	FRSQ SC1	0.000	0	0
72667	FRSQ SC2	0.000	0	0	72668	FRSQ SC3	0.000	0	0	72661	MANCH09A	0.000	0	0
72662	MANCH10A	0.000	0	0	72663	MANCH11A	0.000	0	0	72671	RISE G1	0.000	0	0
72672	RISE G2	0.000	0	0	72673	RISE G3	0.000	0	0	72373	MPLP 1PF	0.000	0	0
72374	MPLP 2PF	0.000	0	0	71251	CANAL G1	0.957	566	-50	71252	CANAL G2	0.000	0	0
71094	PLGRM G1	1.036	670	135	71092	EDG ST	0.000	0	0	71093	EDG GTS	0.000	0	0
71522	SOM G6	0.000	0	0	72669	TIVER G1	0.000	0	0	72670	TIVER G2	0.000	0	0
71524	DGHTNPWR	0.000	0	0										

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	423	BRPT-ENERGY	180	-60	MIDDLETOWN	0	0
MONTVILLE	0	0	NORWALK	0	0	BPTHBR	0	0
NHHARBOUR	447	0	DEVON	0	0	MERIDEN	0	0
WALLINGFORD	0	0	BERKSHIRE	0	0	LAKEROAD	0	0
STONYBROOK	0	0	MILLENNIUM	0	0	BRAYTONPT	1335	149
HOPE	0	0	FRSQ	0	0	SOMERSET	0	0
OSP	232	0	NEA	111	0	CANAL	566	-50
PILGRIM	670	135	MASSPWRR	172	14	ANP-BELLINGHAM	289	-100
ANP-BLACKSTONE	0	0	EMI-TIVERTON	0	0	EMI-DIGHTON	0	0
SITHE-EDGAR	0	0	MYSTIC	107	-150	NEWBOSTON	0	0
SALEMHBR	662	-195	SITHE-MYSTIC	476	-100	SEABROOK	1318	375
NEWINGTON	0	0	ConEd_Newington	0	0	SCHILLER	0	0
MERRIMACK	0	0	WYMAN	0	0	VTYANKEE	667	150
BEARSWAMP	-568	123	NORTHFIELD	-250	80	ALTRESCO	146	14
MIS	315	84	AEC	0	0	RPA	272	85
WESTBROOK	555	71	BUCKSPORT	0	0			
EXETRWIND	0	0						

INTERFACE FLOWS
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NB-NE	1001	-28	ORRING-SOUTH	1151	-522	SUROWIEC-SOUTH	1038	-88
MEYANKEE-SOUTH	893	-249	MAINE-NH	1560	-77	NNE-SCOBIE+394	2611	206
SEABROOK-SOUTH	1396	206	NORTH-SOUTH	3228	-99	CMFD/MOORE-SO	380	29
SNDYPOND-SOUTH	795	-162	CONN-IMPORT	470	4	SWCT	642	-130
NE-NRWLK-STFD	30	121	BOSTON IMPORT	1050	-644	SEMA/RI EXPORT	1403	-576
SEMA EXPORT	575	-609	EAST-WEST	2268	-8	NY-NE 2200(170	-1246	187
NW VT	45	14	PV20 PAR	100	9<-20	BLISS PAR	0	-2
CROSS-SOUND	-351	86	LILCO	0	-18	214	120	-15
F206	128	32						

HVDC TRANSFERS FROM H-Q
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CHAT-1 = 0		HIGHGATE = 194
MADAWASK = 0	PHII-P1 = 0	PHII-P2 = 0
EEL = 0		

BUS VOLTAGES
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	V	LMT			V	LMT			V	LMT	
70001 CHESTER	342.			72692 NWGTN345	357.			72694 SEBRK345	357.		
71789 TEWKS	353.			70759 MYSTIC	353.			71797 MILLBURY	353.		
72925 LUDLOW	350.			72926 NRTHFLD	349.			73106 SOUTHGTN	351.		
73108 CARD	355.			73109 MONTVILE	355.			73110 MILLSTNE	357.		
73116 MIDDLTWN	353.			71801 BRAYTN P	359.			71811 KENT CO.	355.		
71326 BRIDGWTR	356.			71336 SHERMAN	355.			71338 OS POWER	355.		
71337 WFARNUM	356.			70772 W MEDWAY	354.			70780 WWALP345	355.		
70783 PILGRIM	358.			70773 NEA 336	354.			71193 CANAL	356.		
71133 CARVER	357.			70655 SHELBRNE	116.	L		70795 FRMNGHAM	237.		
70793 MDFRM230	240.			70794 MDWLT230	240.			70818 MYSTC MA	118.		
71891 SALEM HR	117.			72096 MILLBURY	118.		63.0 *	71377 SOMERSET	120.		
72277 MIDWEYMT	117.			72259 MINK 183	119.			72574 WARRN 84	118.		
72569 FRSQ	119.		0.0	72566 PHILP183	119.			72553 ADMIRAL3	119.		
71405 PAWTUCKT	119.			71379 SWANSEA	119.			72269 WITNPD43	118.		
72278 FIELD 1	117.			72266 READ ST	119.			72267 S WREN29	118.		
72254 DEPOT129	118.			72255 DEPOT130	118.			72582 WOONSCKT	119.		
71403 WFARNUM	119.			72579 WOLF 171	119.			72584 HARTAVE	119.		
72544 JOHNSTN1	119.		0.0	72545 JOHNSTN2	119.		0.0	72560 DRUMROCK	119.		0.0
72565 KENT CO	119.		0.0	72570 SOCK187	118.			72571 SOCK188	118.		
72557 DAVIST85	119.			72559 DAVIS 90	119.			72572 W.KINGST	120.		0.0
72538 KENYON	120.			72581 WOOD RIV	120.			70512 ESX B-2	116.		
70487 COOL 345	352.			70520 W RUTLND	118.			73281 EXETR PF	118.		
90000 Q166-POI	119.			72760 POTOK PH	119.			72731 LOST NAT	119.		
72752 WHITEFLD	119.			71838 MOORE	119.			72713 BERLIN	118.		
72729 LITTLTN	119.			72753 WOODSTKH	119.			70496 GRAN 230	232.		
91000 Q229_LINK	118.			72759 PEMI	117.			72712 BEEBE	119.		
94001 Q345 TAP	118.										

AREA/ZONE TOTALS
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NEPOOL_GEN	13085	NEPOOL_LOAD	12396	NEPOOL_LOSS	480	
NEPOOL_INT	201					
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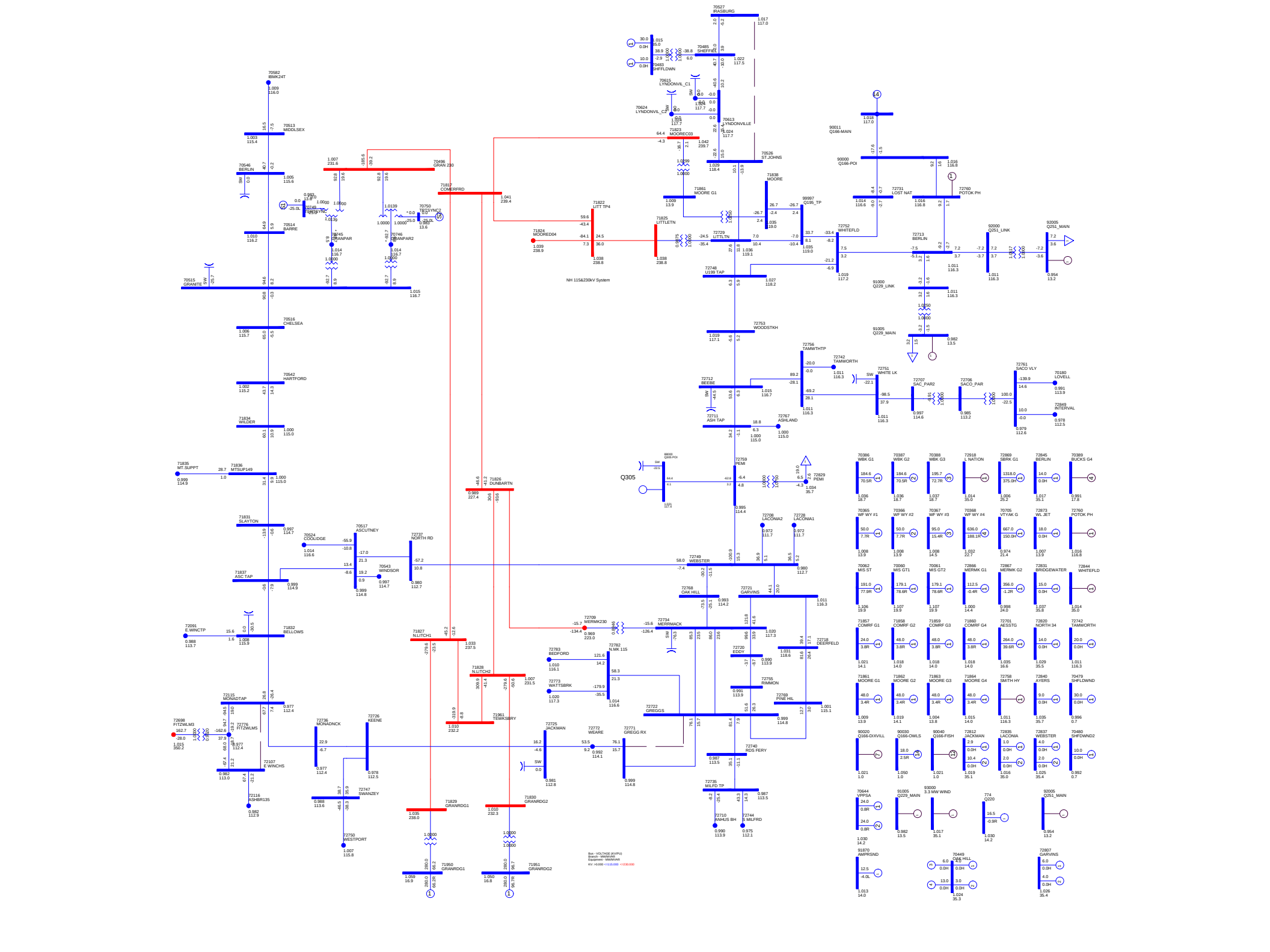
Appendix

B

Power Flow One Line Diagrams



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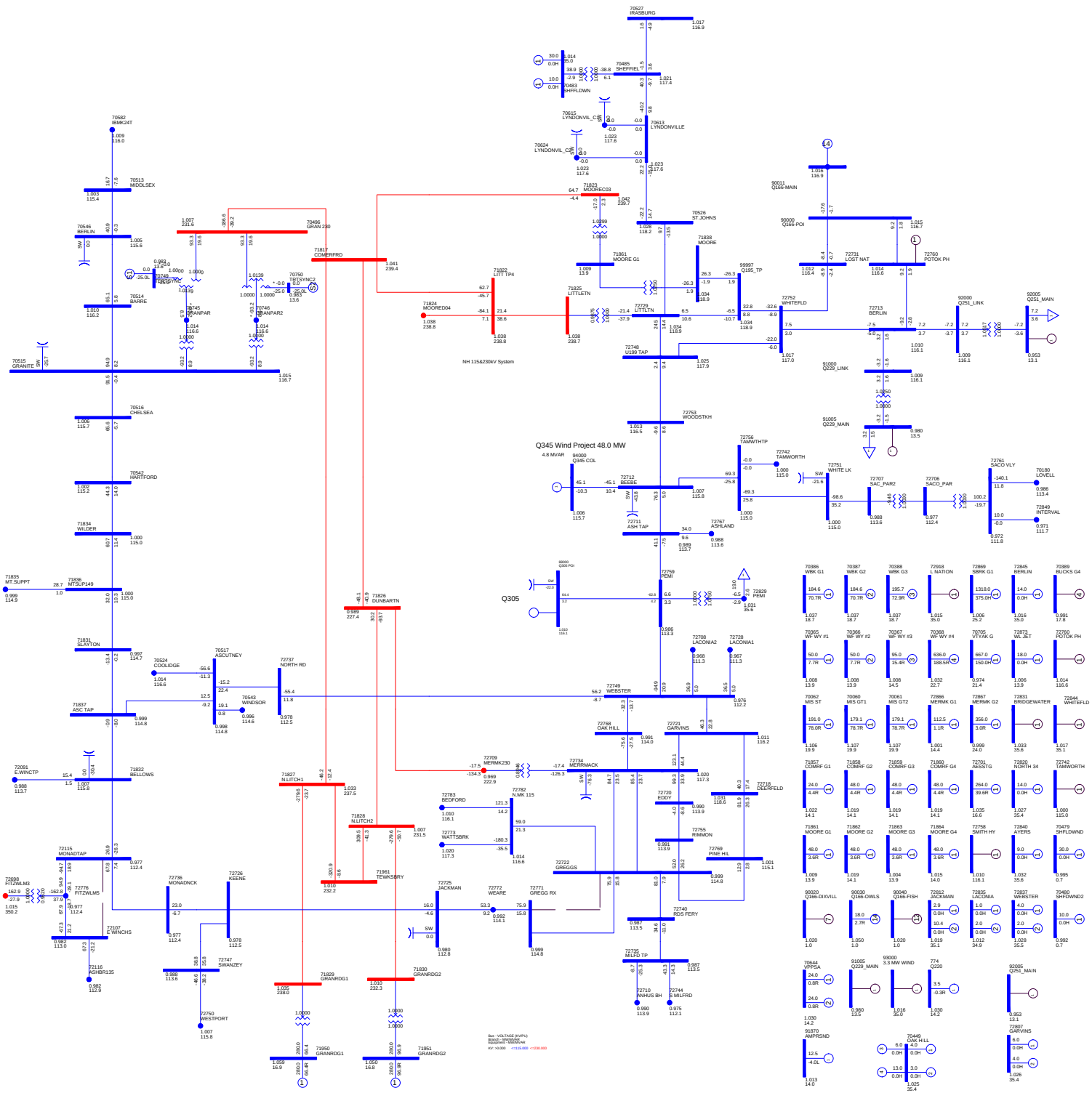
2013 SUMMER PEAK - Q345 - PRE-PROJECT

MON, APR 11 2011 15:25


70582 IBMK24T
70513 MIDDLSEX
70546 BERLIN
70514 BARRE
70515 GRANITE
70516 CHELSEA
70542 HARTFORD
71834 WILDER
71835 MT.SUPPT
71836 MTSUP149
71831 SLAYTON
71837 ASC.TAP
72091 E.WINCTP
71832 BELLOWS
72115 MONADTAP
72698 FITZWLM3
72776 FITZWLM5
72107 E.WINCHS
72116 ASHBR135
70517 ASCUTNEY
70524 COOLIDGE
72737 NORTH RD
70543 WINDSOR
70496 GRAN 230
70745 BRANPAR
70746 BRANPAR2
70750 TBTSYNC2
71817 COMERFRD
71826 DUNBARTN
71827 N.LITCH1
71828 N.LITCH2
71961 TEWKSBRY
72736 MONADNCK
72726 KEENE
72747 SWANZEY
72750 WESTPORT
71829 GRANRDG1
71830 GRANRDG2
71950 GRANRDG1
71951 GRANRDG2
70527 IRASBURG
70485 SHEFFIELD
70483 SHFFLDWN
70615 LYNDONVIL_CS
70624 LYNDONVIL_CS2
70613 LYNDONVILLE
71823 MOOREC03
70526 ST.JOHNS
71838 MOORE
71861 MOORE G1
71822 LITT TP4
71824 MOORED04
71825 LITTLETN
72720 LITLTN
72748 U199 TAP
72753 WOODSTKH
NH 115&230kV System
Q345 Wind Project 48.0 MW
4.8 MVAR
94000 Q345 COL
72712 BEEBE
72711 ASH TAP
72767 ASHLAND
72756 TAMWHTP
72742 TAMWORTH
72751 WHITE LK
72707 SAC_PAR2
72706 SACO_PAR
72761 SACO VLY
70180 LOVELL
72849 INTERVAL
Q305
72759 PEMI
72829 PEMI
72708 LACONIA2
72728 LACONIA1
72749 WEBSTER
72768 OAK HILL
72221 GARVINS
72709 MERMK230
72734 MERRMACK
72719 DEERFIELD
72783 BEDFORD
72782 N.MK 115
72773 WATTSBRK
72720 EDDY
72755 RIMMON
72769 PINE HIL
72722 GREGGS
72740 RDS FERY
72725 JACKMAN
72772 WEARE
72771 GREGG RX
72735 MILFD TP
72710 ANH/S BH
72744 S MILFRD
90011 Q166-MAIN
90000 Q166-POI
72731 LOST NAT
72760 POTOK PH
72752 WHITEFLD
72713 BERLIN
90000 Q251_LINK
92005 Q251_MAIN
91000 Q229_LINK
91005 Q229_MAIN
70386 WBK G1
70387 WBK G2
70388 WBK G3
72918 L.NATION
72869 SBRK G1
72845 BERLIN
70389 BUCKS G4
70365 WF WY #1
70366 WF WY #2
70367 WF WY #3
70368 WF WY #4
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Branch - MW/MVAR
Equipment - MW/MVAR
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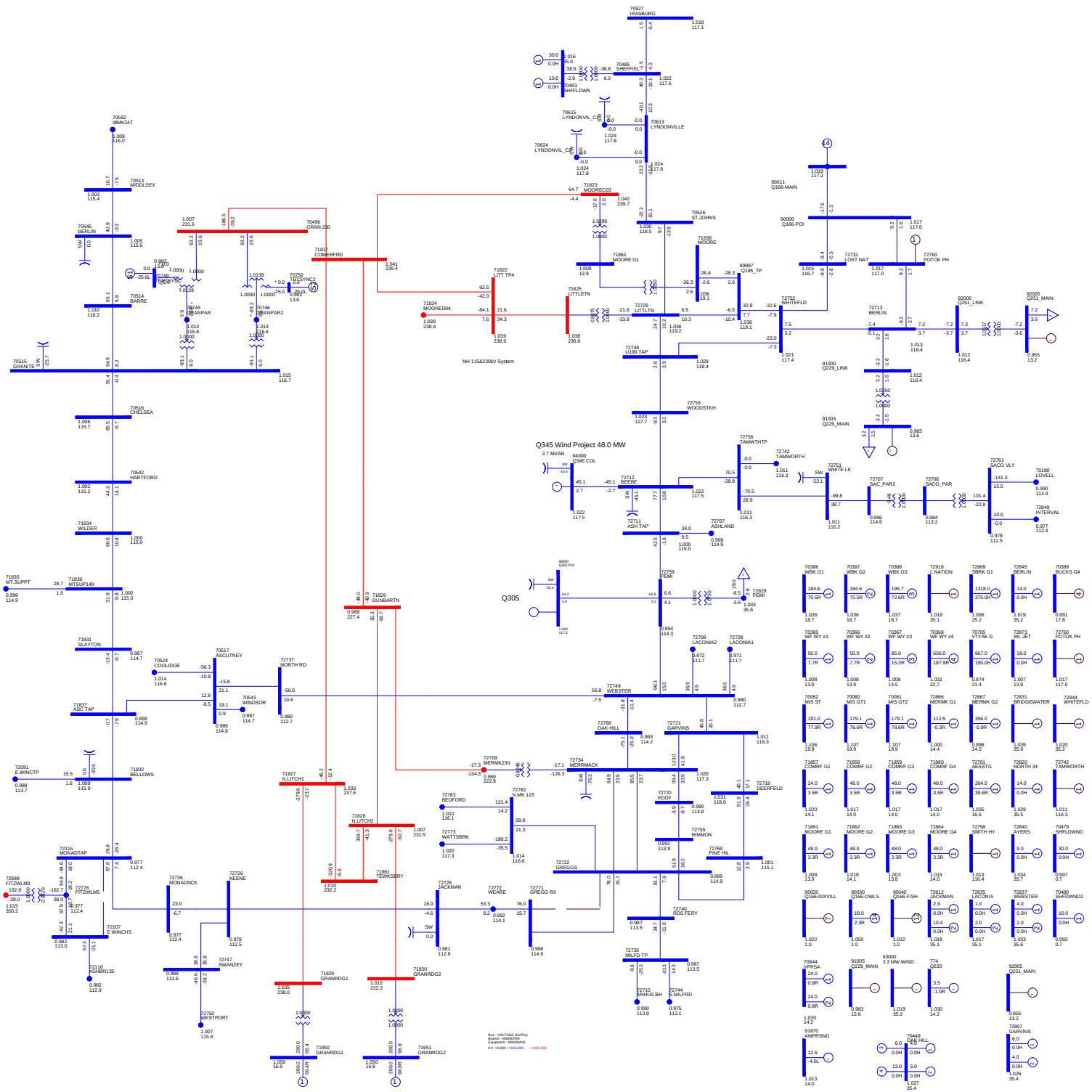
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2.7 MVAR
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2013 SUMMER PEAK - Q345 - POST-PROJECT POI-1 WITH CAPS
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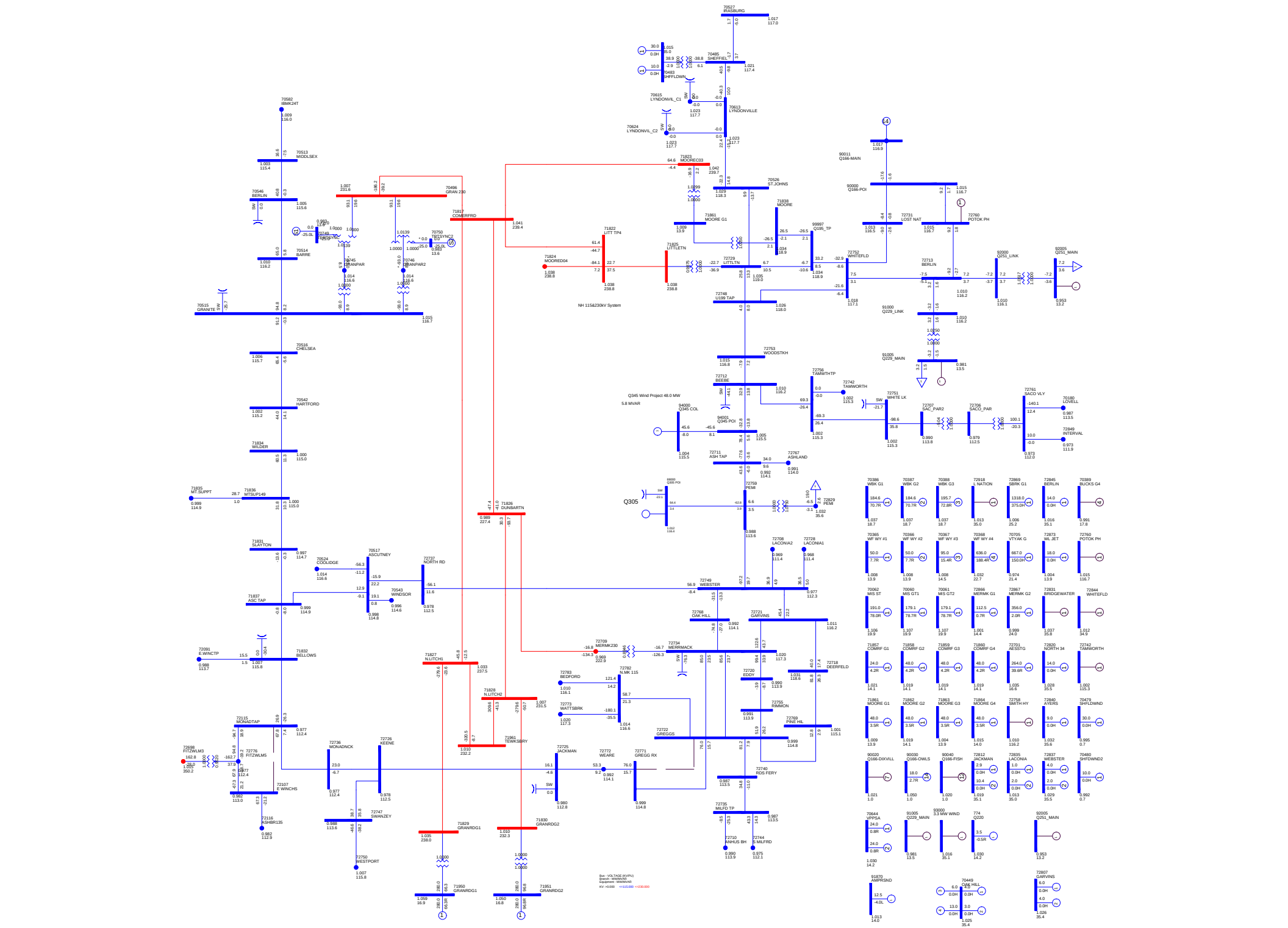

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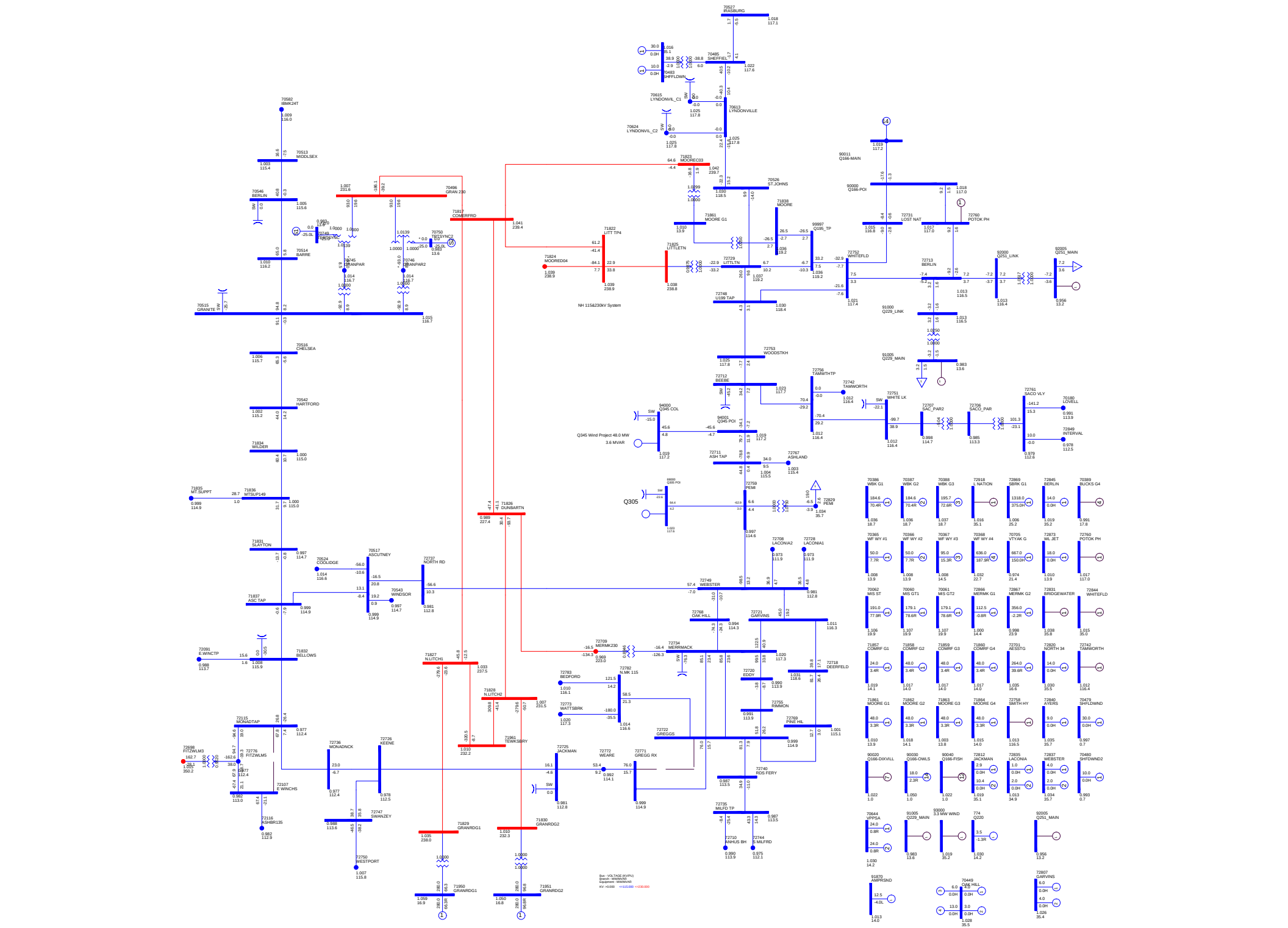
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NH 115&230kV System
Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
kV: >0.000 <=115.000 <=230.000
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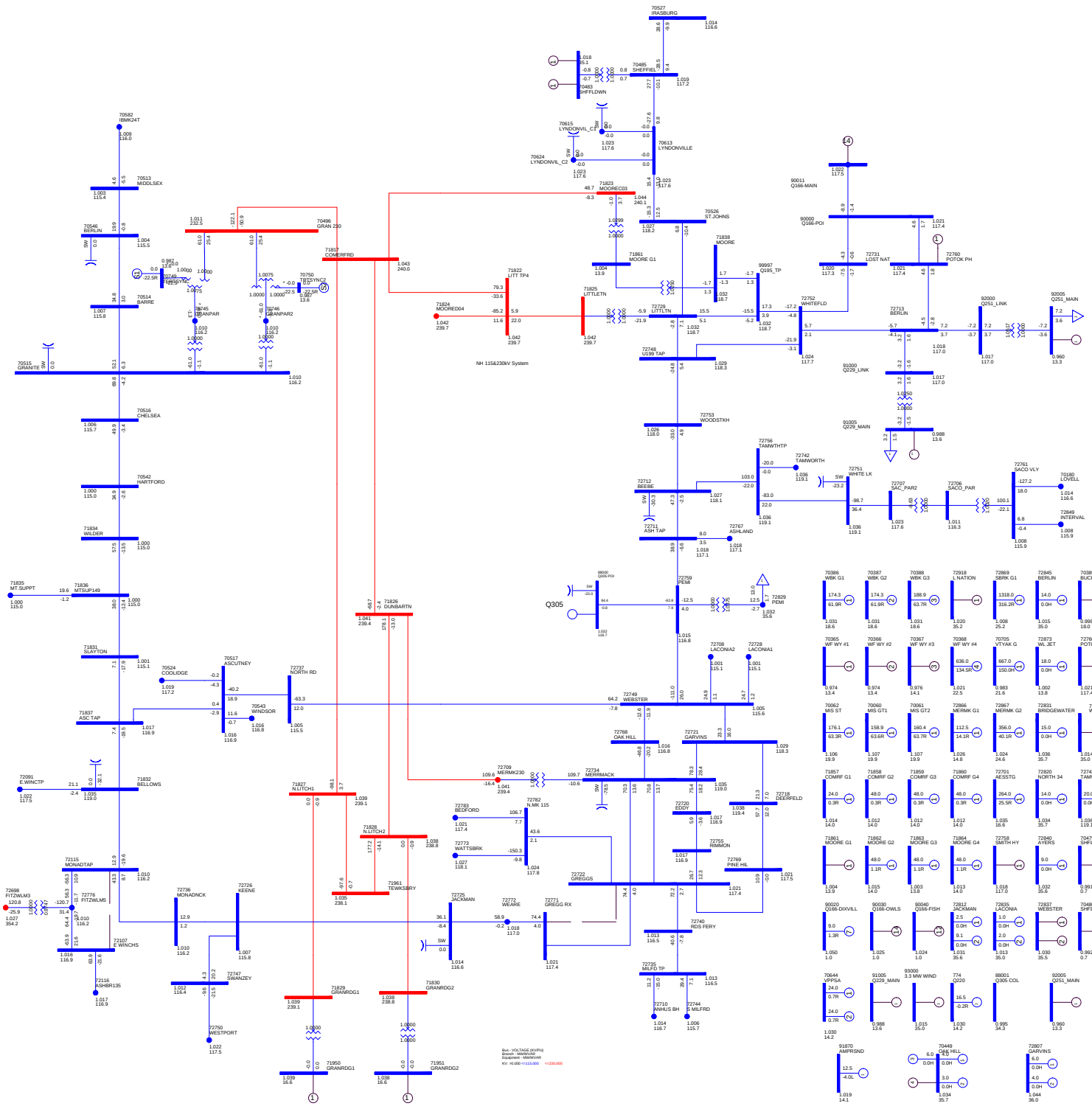
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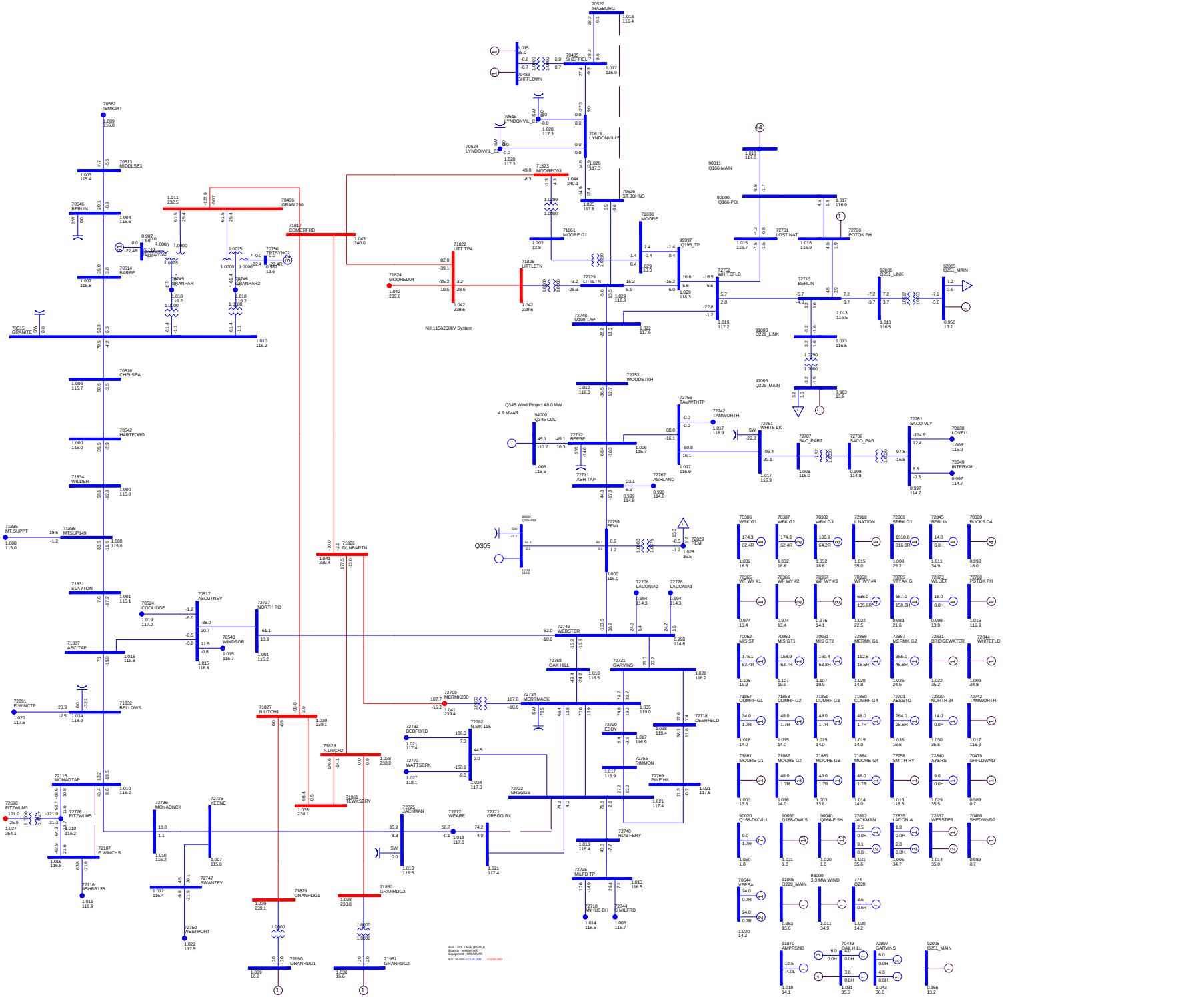

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2013 SUMMER SHOULDER - Q345 - POST-PROJECT POI-1

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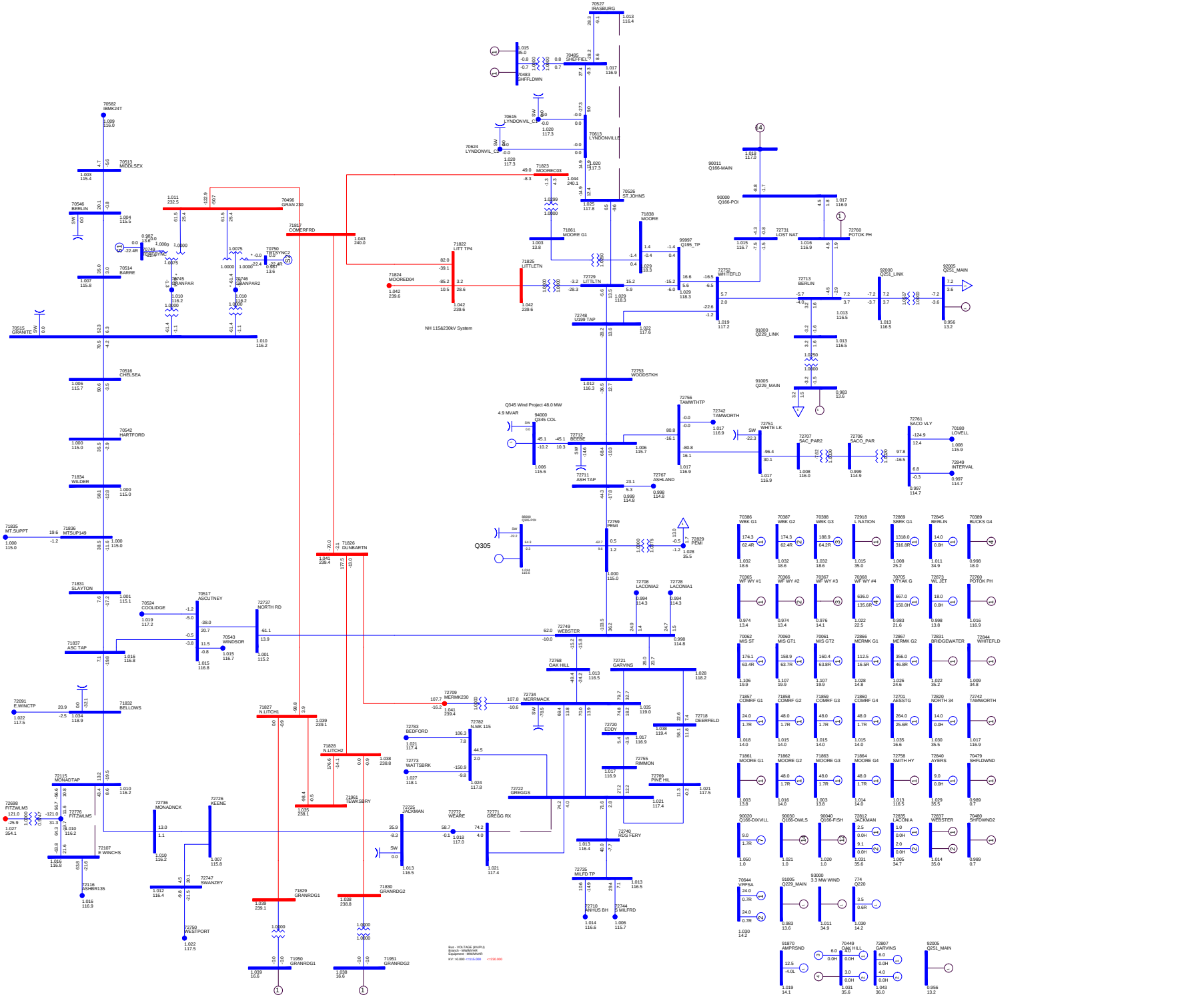

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2013 SUMMER SHOULDER - Q345 - POST-PROJECT POI-1 WITH CAPS

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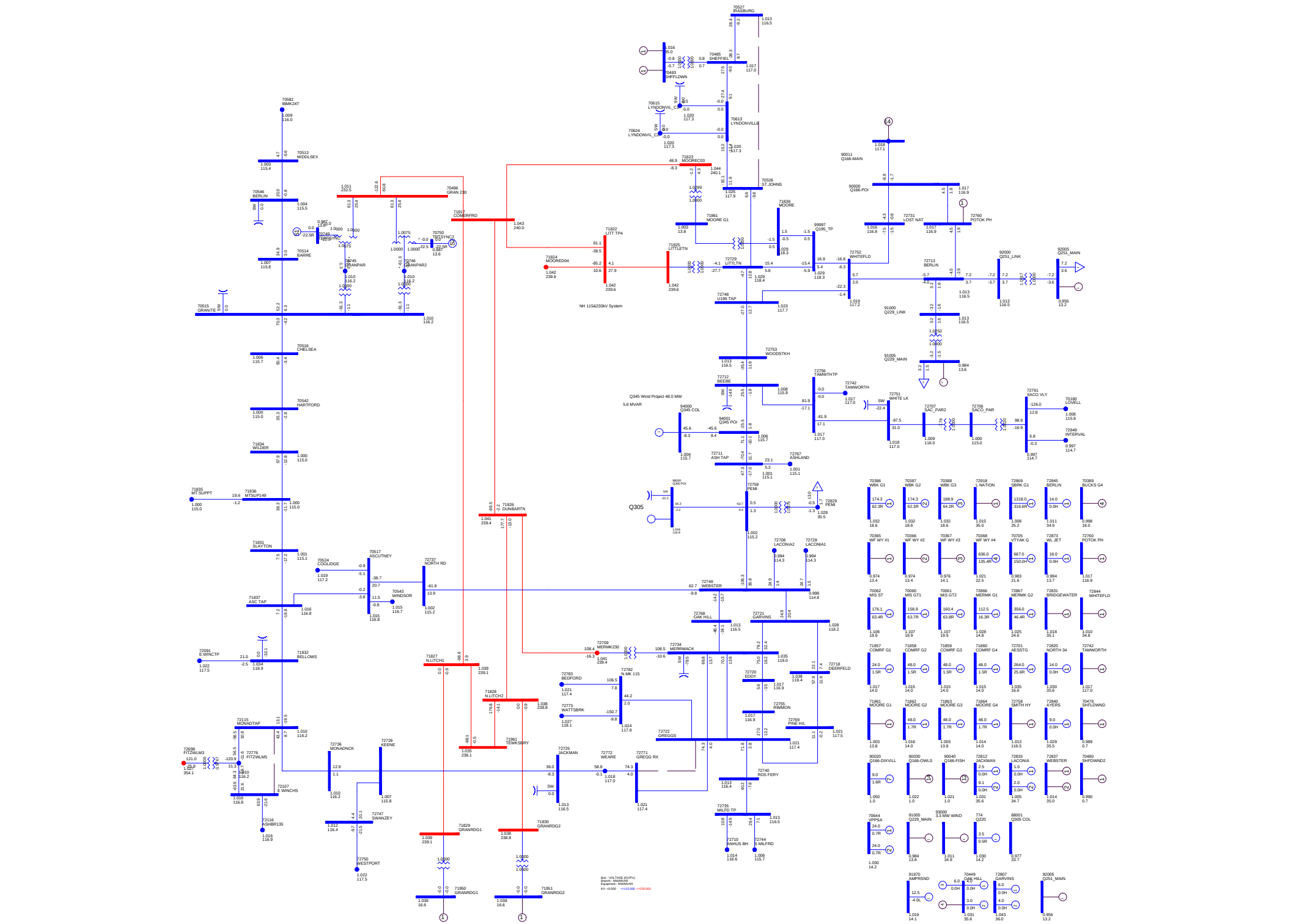
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Branch - MW/MVAR
Equipment - MW/MVAR
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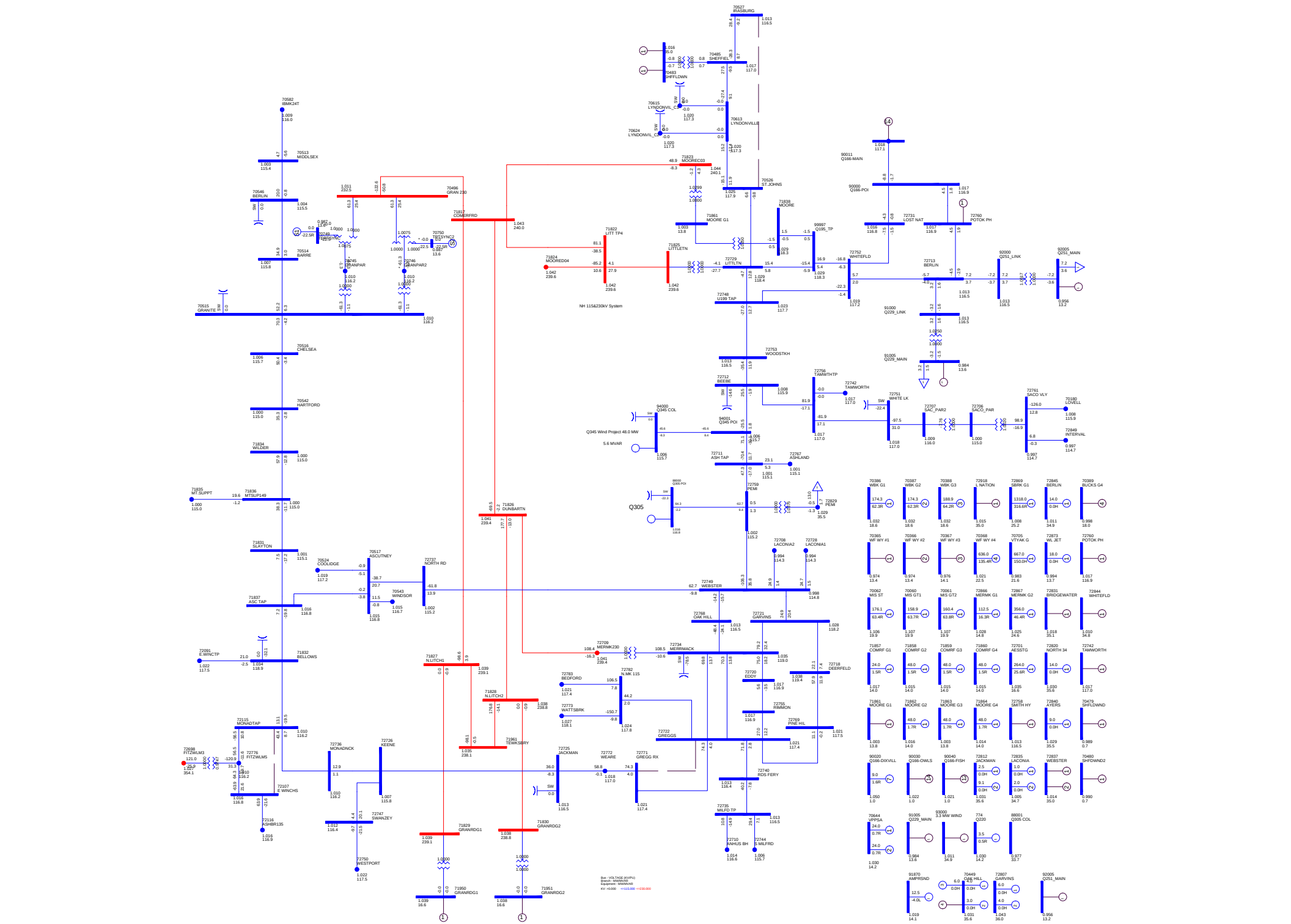

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2013 SUMMER SHOULDER - Q345 - POST-PROJECT POI-2 WITH CAPS

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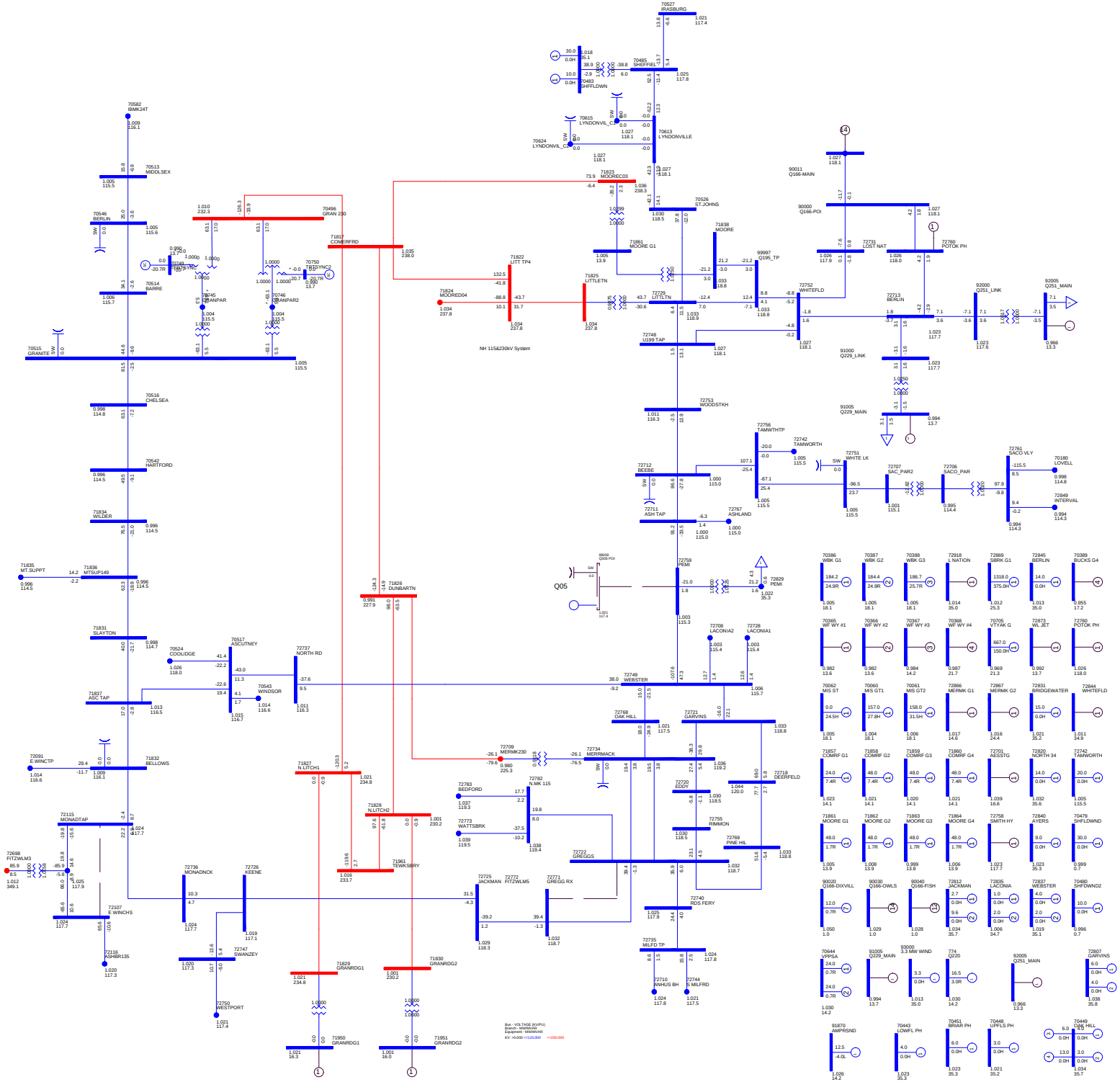
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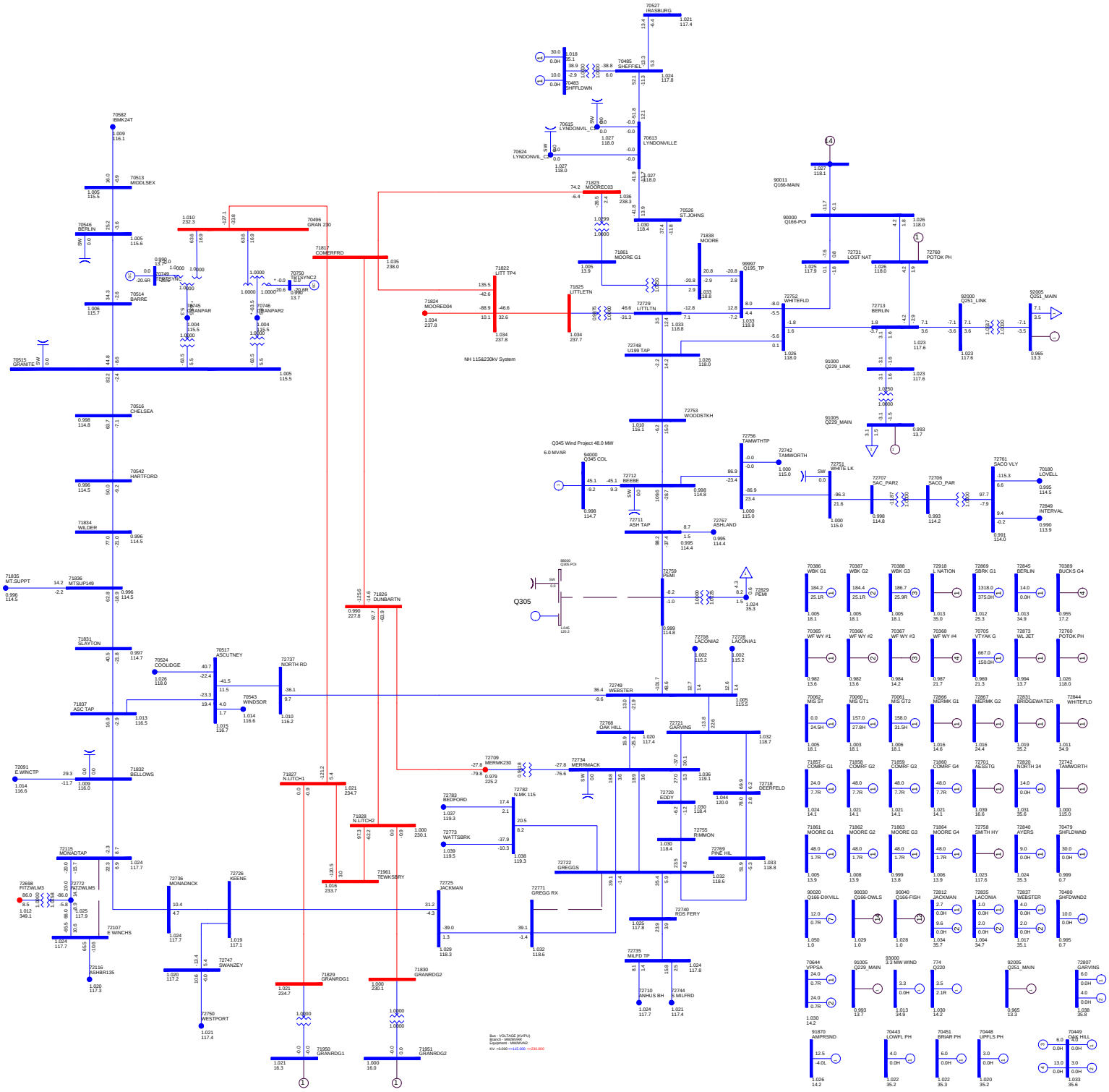
70451 BRIAR PH
70448 LPFLS PH
70449 OAK HILL



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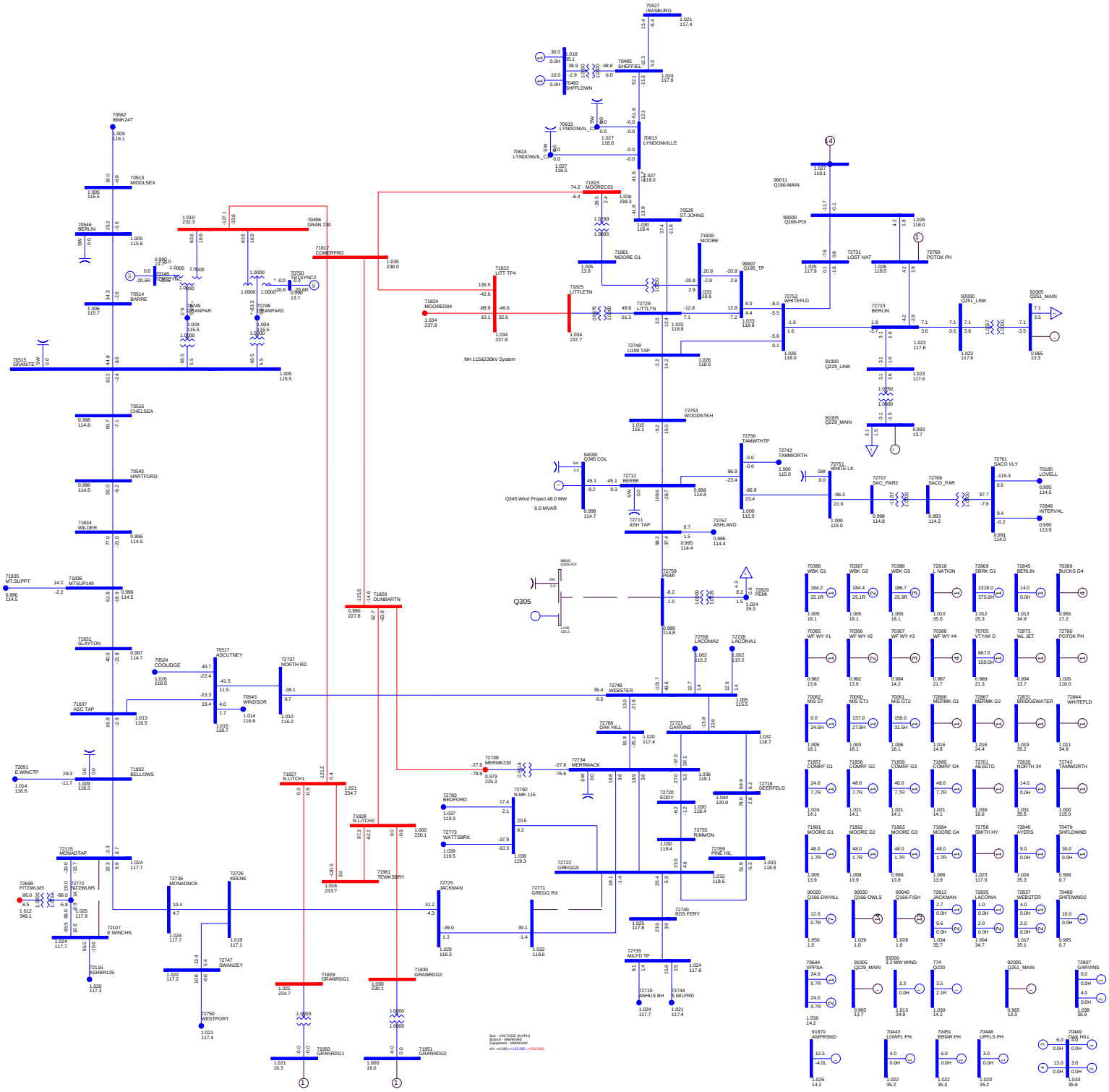

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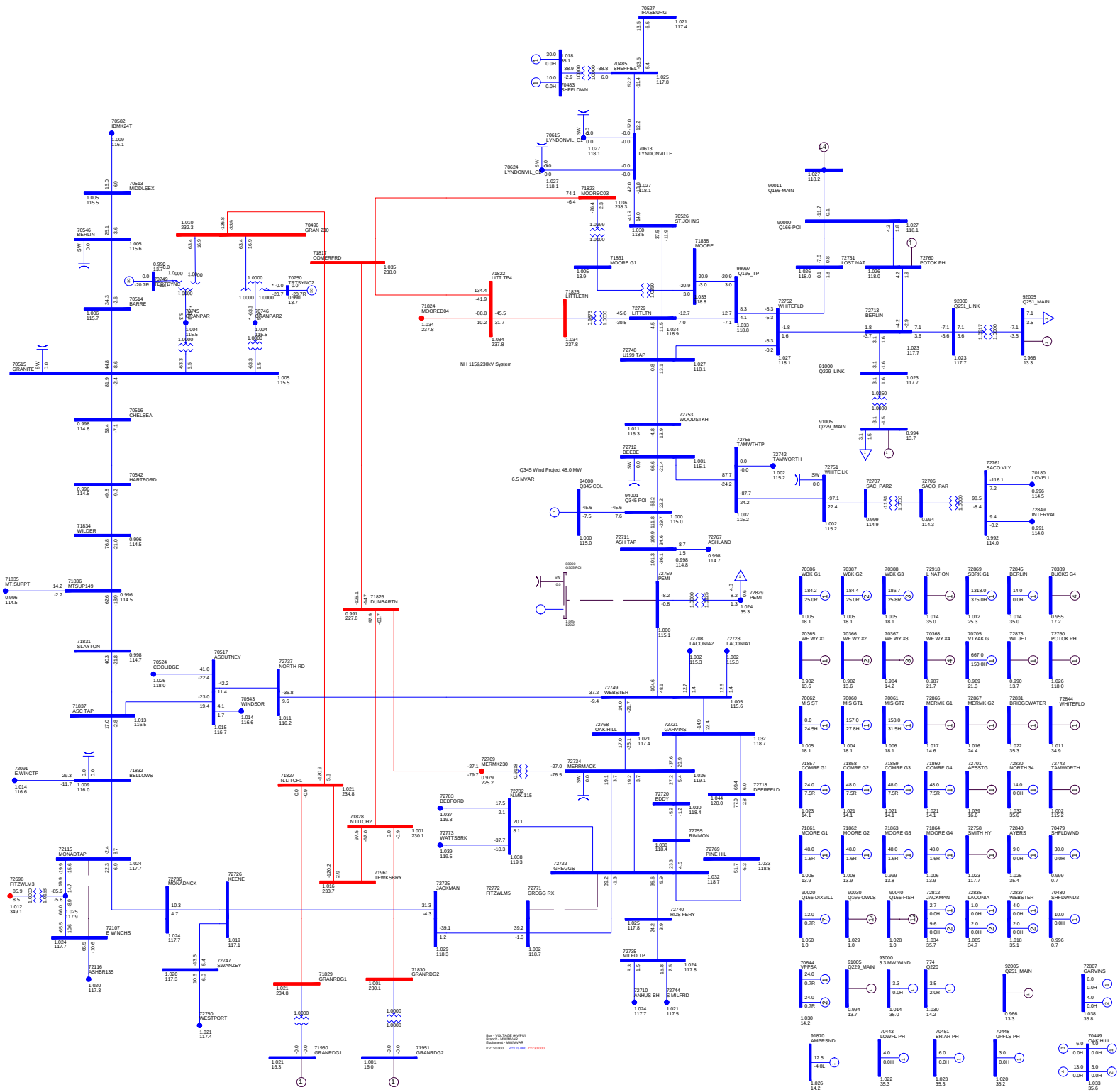
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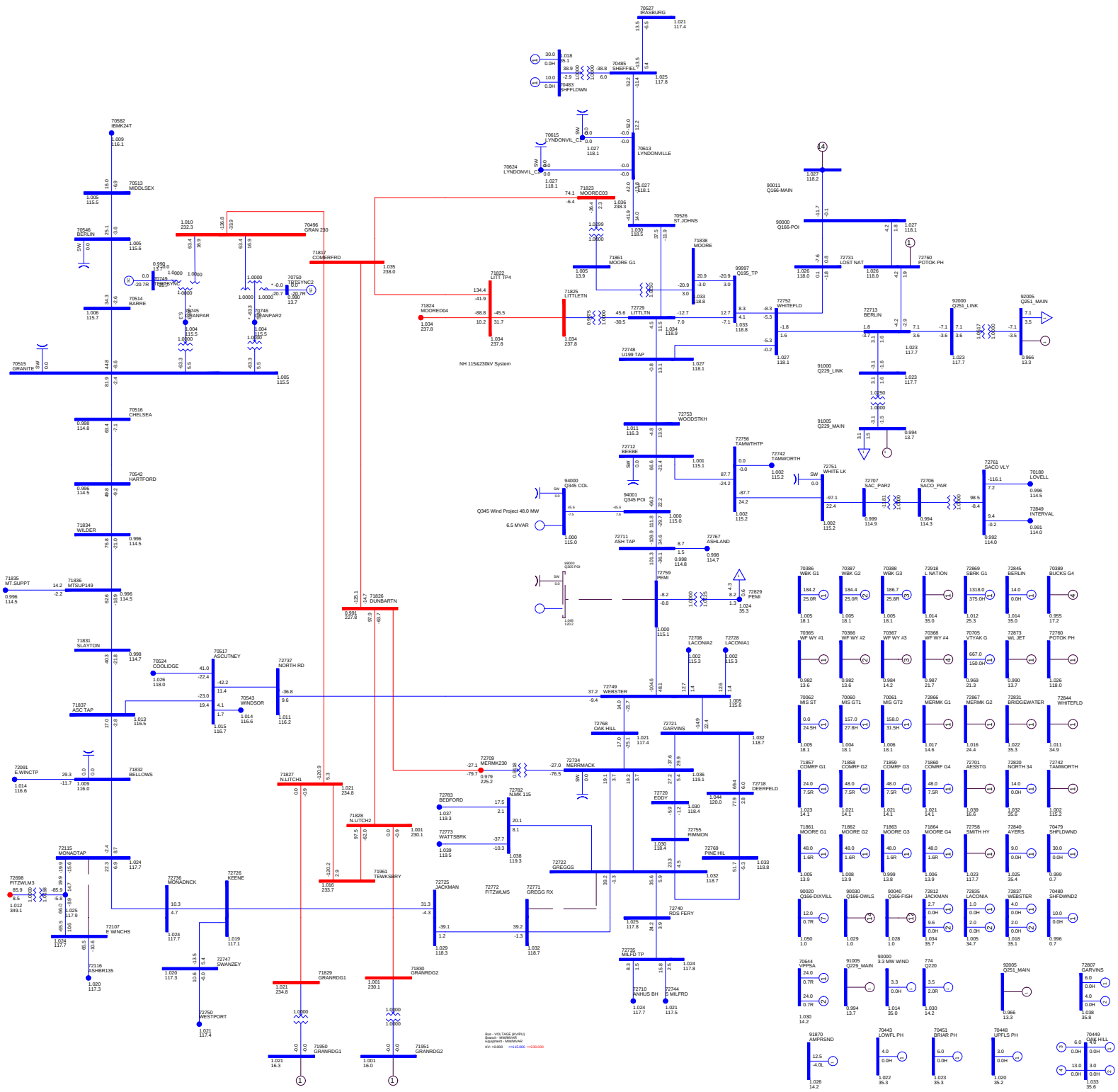
70513 MIDDLSEX
70546 BERLIN
70514 BARRE
70515 GRANITE
70516 CHELSEA
70542 HARTFORD
71834 WILDER
71835 MT.SUPPT
71836 MTSUP149
71831 SLAYTON
71837 ASC TAP
72091 E.WINCTP
71832 BELLOWS
72115 MONADTAP
72698 FITZWLM3
72107 E WINCHS
72116 ASHBR13S
70524 COOLIDGE
70517 ASCUTNEY
70543 WINDSOR
72737 NORTH RD
72736 MONADNCK
72726 KEENE
72747 SWANZEY
72750 WESTPORT
70496 GRAN 230
71817 COMERFRD
70745 GRANPAR
70746 GRANPAR2
70750 TBTSYNC2
71826 DUNBARTN
71827 N.LITCH1
71828 N.LITCH2
71961 TEWKSBRY
71829 GRANRDG1
71830 GRANRDG2
71950 GRANRDG1
71951 GRANRDG2
70527 IRASBURG
70485 SHEFFIEL
70483 SHFFLDWN
70615 LYNDONVIL_C
70624 LYNDONVIL_C
70613 LYNDONVILLE
71823 MOOREC03
70526 ST_JOHNS
71838 MOORE
71861 MOORE G1
71822 LITT TP4
71824 MOORED04
71825 LITTLETN
72729 LITTLTN
72748 U199 TAP
72753 WOODSTKH
72712 BEEBE
72711 ASH TAP
72767 ASHLAND
72759 PEMI
72829 PEMI
72708 LACONIA2
72728 LACONIA1
72749 WEBSTER
72768 OAK HILL
72221 GARVINS
72709 MERMK230
72734 MERMACK
72782 N.MK 11S
72783 BEDFORD
72773 WATTSBRK
72722 GREGGS
72772 FITZWLMS
72771 GREGG RX
72225 JACKMAN
72740 RDS FERY
72735 MILFD TP
72710 ANHUS BH
72744 S MILFRD
72720 EDDY
72755 RIMMON
72769 PINE HIL
72718 DEERFELD
90011 Q166-MAIN
90000 Q166-POI
72731 LOST NAT
72760 POTOK PH
72713 BERLIN
92000 Q251_LINK
92005 Q251_MAIN
91000 Q229_LINK
91005 Q229_MAIN
72752 WHITEFLD
99097 Q196_TP
72756 TAMWTHTP
72742 TAMWORTH
72751 WHITE LK
72707 SAC_PAR2
72706 SACO_PAR
72761 SACO VLY
70180 LOVELL
72849 INTERVAL
94000 Q345 COL
94001 Q345 POI
Q345 Wind Project 48.0 MW
6.5 MVAR
NH 115&230kV System
70386 WBK G1
70387 WBK G2
70388 WBK G3
72918 L NATION
72869 SBRK G1
72845 BERLIN
70389 BUCKS G4
70365 WF WY #1
70366 WF WY #2
70367 WF WY #3
70368 WF WY #4
70705 VTYAK G
72873 WL JET
72760 POTOK PH
70062 MIS ST
70060 MIS GT1
70061 MIS GT2
72866 MERMK G1
72967 MERMK G2
72831 BRIDGEWATER
72844 WHITEFLD
71857 COMRF G1
71858 COMRF G2
71859 COMRF G3
71860 COMRF G4
72701 AESSTG
72820 NORTH 34
72742 TAMWORTH
71861 MOORE G1
71862 MOORE G2
71863 MOORE G3
71864 MOORE G4
72758 SMITH HY
72840 AYERS
70479 SHFLDWND
90020 Q166-DIXVILL
90030 Q166-OWLS
90040 Q166-FISH
72812 JACKMAN
72835 LACONIA
72837 WEBSTER
70480 SHFDWND2
70644 VPPSA
91005 Q229_MAIN
93000 3.3 MW WIND
774 Q220
92005 Q251_MAIN
72807 GARVINS
91870 AMPRSND
70443 LOWFL PH
70451 BRIAR PH
70448 UPFLS PH
70449 OAK HILL
Bus - VOLTAGE (KV/PU)
Branch - MW/MVAR
Equipment - MW/MVAR
KV: >0.000 <=15.000 <=230.000



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Appendix

C

List of Contingencies

List of contingencies created or modified by the Project
/
Contingency 'LOS_Q345_1' - For POI Configuration 1
Contingency 'LOS_Q345_2' - For POI Configuration 2
Contingency 'E115-N' – For POI Configuration 2
Contingency'E115-S' – For POI Configuration 2
Contingency 'E1150-SB-2'' – For POI Configuration 2
Contingency 'Q345-SB-2' – For POI Configuration 2
Contingency 'BEE_SB_115-2' – For POI Configuration 2
/
List of other relevant contingencies simulated
/
Contingency 'WHTFLD_195SB'
Contingency 'WHTFLD_178SB'
Contingency 'WHTFLD_142SB'
Contingency 'S136'
Contingency 'Los_Q229_OP4'
Contingency 'Loss_Q251'
Contingency 'K38' – added following Lyndonville Project
Contingency 'K39' – added following Lyndonville Project
Contingency 'K28' – added following Lyndonville Project
Contingency 'LYN K39SB' – added following Lyndonville Project
Contingency 'LYN K28-39SB' – added following Lyndonville Project
Contingency 'LYN KT1SB' – added following Lyndonville Project
Contingency 'LYN K28SB' – added following Lyndonville Project
Contingency 'O154'
Contingency 'Loss_Q166'
Contingency 'LOSTNAT_SB-Q'
Contingency 'W179'
Contingency 'Q166-SB'
Contingency '214'
Contingency 'A111'
Contingency 'A-201 '
Contingency 'B-112'
Contingency 'B-202 '

Contingency ‘BEEBE_SB’
Contingency ‘BRLIN_SB’
Contingency ‘C106’
Contingency ‘C196’
Contingency ‘C-203 ‘
Contingency ‘CMFD 0121 BF’
Contingency ‘CMFD 0234 BF’
Contingency ‘CMFD 0366 BF’
Contingency ‘CMFD 0406 BF’
Contingency ‘CMFD 221 BF’
Contingency ‘CMFD 234 BF’
Contingency ‘CMFD A201 BF’
Contingency ‘CMFD B202 BF’
Contingency ‘CMFD C203 BF’
Contingency ‘CMFD D204 BF’
Contingency ‘CMFD F206 BF’
Contingency ‘CMFD N266 BF’
Contingency ‘CMP’
Contingency ‘COMF 1T/2T’
Contingency ‘COMF 3T/4T’
Contingency ‘D-142’
Contingency ‘D-204 ‘
Contingency ‘E115’
Contingency ‘F139’
Contingency ‘F-206 ‘
Contingency ‘G146’
Contingency ‘GARV_SB’
Contingency ‘GRANITE_AUT2’
Contingency ‘GRANITE_AUTO’
Contingency ‘GRANRIDGE’
Contingency ‘H137’
Contingency ‘H-208 ‘
Contingency ‘K174OOS’
Contingency ‘K-211 ‘
Contingency ‘K26-1 ‘
Contingency ‘K26-2 ‘
Contingency ‘K26-3 ‘
Contingency ‘K29/60 ‘
Contingency ‘K31 ‘
Contingency ‘K34-W ‘
Contingency ‘L208209’
Contingency ‘L210211’
Contingency ‘L-212 ‘

Contingency ‘L340’
Contingency ‘L374 ‘
Contingency ‘L385 ‘
Contingency ‘L391 ‘
Contingency ‘LIT_SB_6099A’ - Q195 closed at Littleton
Contingency ‘LITTLTN_AUTO’
Contingency ‘LOSTNAT_SB’
Contingency ‘M127_K174’
Contingency ‘MERRMK_AUTO’
Contingency ‘MK1’
Contingency ‘MK2’
Contingency ‘MRMK_SB_1’
Contingency ‘MRMK_SB_12’
Contingency ‘MRMK_SB_2’
Contingency ‘MRMK_SB_23’
Contingency ‘MRMK_SB_3’
Contingency ‘N-214 ‘
Contingency ‘N-266 ‘
Contingency ‘NLTCH 0115BF’
Contingency ‘NLTCH 0214BF’
Contingency ‘O-215 ‘
Contingency ‘O-215-SPS’
Contingency ‘OKHL_SB’
Contingency ‘P145’
Contingency ‘PEMI_SB’
Contingency ‘Q171’
Contingency ‘Q195’
Contingency ‘Q195A’ - Q195 closed at Littleton
Contingency 'S-136'
Contingency 'SACOVAL_SB'
Contingency 'SLAYTN 115BF'
Contingency 'V182'
Contingency 'K41'
Contingency 'Vernon T1 '
Contingency 'W149-N '
Contingency 'W149-S '
Contingency 'W-179'
Contingency 'WEBS_SB_1'
Contingency 'WEBS_SB_12'
Contingency 'WEBS_SB_2'
Contingency 'WHITELK_SB'
Contingency 'WHITFLD_SB'
Contingency ‘WHITFLD_SB_A’ - Q195 closed at Littleton

Contingency 'WILD 115 BUS'
Contingency 'WILDER 149BF'
Contingency 'WILDER K26BF'
Contingency 'X178-U199'
Contingency 'Y138'
Contingency 'Z-177'

Appendix

D

N-1 Results

D.1 N-1 Thermal Results

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Thermal Impact - POI-1 (Beebe 115 kV)

1	2	3	4	5	6	7	8
Monitored Element	**Rating**	**Loading(%)**	**Rating**	**Loading(%)**	**(5)-(3)**		
**** From bus ** ** To bus ** CKT**	**MVA**	**Without Project**	**MVA**	**With Project**	**Impact (%)**	**Prior Outage**	**Contingency**
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	96.4	382	96.8	0.38	Intact	F-206 OPEN BRANCH FROM BUS 70496 [GRAN 230 230.00] TO BUS 71817 [COMERFRD 230.00] CKT 1
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	99.5	382	99.8	0.29	Intact	N-214 OPEN BRANCH FROM BUS 71828 [N.LITCH2 230.00] TO BUS 71961 [TEWKSBRY 230.00] CKT 1
70117 LIVERMOR 115.00 70152 RILEY 115.00 1	226.1	99	226.1	99	0.04	Intact	L210211 OPEN BRANCH FROM BUS 70103 [KIMBL RD 115.00] TO BUS 70168 [WOODSTK 115.00] CKT 1 OPEN BRANCH FROM BUS 70101 [RUMFRDGN 115.00] TO BUS 70168 [WOODSTK 115.00] CKT 1
72722 GREGGS 115.00 72755 RIMMON 115.00 1	175	96.1	175	96.1	0.01	Intact	MRMK_SB_12 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72720 [EDDY 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72865 [MK CT 13.200] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72866 [MERMK G1 14.400] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Thermal Impact - POI-1 (Beebe 115 kV)							
1	2	3	4	5	6	7	8
Monitored Element	Rating	Loading(%)	Rating	Loading(%)	(5)-(3)		
** From bus ** ** To bus ** CKT	MVA	Without Project	MVA	With Project	Impact (%)	Prior Outage	Contingency
No significant thermal impact							

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)

Thermal Impact - POI-1 (Beebe 115 kV)

1	2	3	4	5	6	7	8
Monitored Element	**Rating**	**Loading(%)**	**Rating**	**Loading(%)**	**(5)-(3)**		
**** From bus ** ** To bus ** CKT**	**MVA**	**Without Project**	**MVA**	**With Project**	**Impact (%)**	**Prior Outage**	**Contingency**
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	91.9	193	98.2	6.34	Intact	E115 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN BRANCH FROM BUS 72831 [BRIDGEWATER 34.500] TO BUS 72767 [ASHLAND 115.00] CKT 1
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	92.1	193	98.3	6.2	Intact	PEMI_SB OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	93.6	193	96.3	2.64	Intact	PEMI_SB_1110 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)							
Thermal Impact - POI-2 (Tapped E115 line)							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Monitored Element	**Rating**	**Loading(%)**	**Rating**	**Loading(%)**	**(5)-(3)**		
**** From bus ** ** To bus ** CKT**	**MVA**	**Without Project**	**MVA**	**With Project**	**Impact (%)**	**Prior Outage**	**Contingency**
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	96.4	382	96.7	0.24	Intact	F-206 OPEN BRANCH FROM BUS 70496 [GRAN 230 230.00] TO BUS 71817 [COMERFRD 230.00] CKT 1
71827 N.LITCH1 230.00 71961 TEWKSBRY 230.00 1	382	99.5	382	99.7	0.18	Intact	N-214 OPEN BRANCH FROM BUS 71828 [N.LITCH2 230.00] TO BUS 71961 [TEWKSBRY 230.00] CKT 1
70117 LIVERMOR 115.00 70152 RILEY 115.00 1	226.1	99	226.1	99	0.03	Intact	L210211 OPEN BRANCH FROM BUS 70103 [KIMBL RD 115.00] TO BUS 70168 [WOODSTK 115.00] CKT 1 OPEN BRANCH FROM BUS 70101 [RUMFRDGN 115.00] TO BUS 70168 [WOODSTK 115.00] CKT 1
72722 GREGGS 115.00 72755 RIMMON 115.00 1	175	96.1	175	96.1	0.01	Intact	MRMK_SB_12 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72720 [EDDY 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72865 [MK CT 13.200] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72866 [MERMK G1 14.400] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Thermal Impact - POI-2 (Tapped E115 line)							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Monitored Element	**Rating**	**Loading(%)**	**Rating**	**Loading(%)**	**(5)-(3)**		
**** From bus ** ** To bus ** CKT**	**MVA**	**Without Project**	**MVA**	**With Project**	**Impact (%)**	**Prior Outage**	**Contingency**
72749 WEBSTER 115.00 72759 PEMI 115.00 1	140	99	140	99.1	0.1	Intact	X178-U199 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72839 [N WDSTCK 34.500] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72748 [U199 TAP 115.00] TO BUS 72752 [WHITEFLD 115.00] CKT 1 OPEN BRANCH FROM BUS 72748 [U199 TAP 115.00] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72729 [LITTLTN 115.00] TO BUS 72748 [U199 TAP 115.00] CKT 1
72749 WEBSTER 115.00 72759 PEMI 115.00 1	140	98.8	140	98.9	0.1	Intact	WHTFLD_178SB OPEN BRANCH FROM BUS 72844 [WHITEFLD 34.500] TO BUS 72752 [WHITEFLD 115.00] CKT 1 OPEN BRANCH FROM BUS 72752 [WHITEFLD 115.00] TO BUS 99997 [Q195_TP 115.00] CKT 1 OPEN BRANCH FROM BUS 72713 [BERLIN 115.00] TO BUS 72752 [WHITEFLD 115.00] CKT 1 OPEN BRANCH FROM BUS 72731 [LOST NAT 115.00] TO BUS 72752 [WHITEFLD 115.00] CKT 1 OPEN BRANCH FROM BUS 72748 [U199 TAP 115.00] TO BUS 72752 [WHITEFLD 115.00] CKT 1 OPEN BRANCH FROM BUS 72748 [U199 TAP 115.00] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72729 [LITTLTN 115.00] TO BUS 72748 [U199 TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72839 [N WDSTCK 34.500] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72753 [WOODSTKH 115.00] CKT 1
72749 WEBSTER 115.00 72759 PEMI 115.00 1	140	99	140	99.1	0.1	Intact	LIT_SB_6099A OPEN BRANCH FROM BUS 70526 [ST.JOHNS 115.00] TO BUS 72729 [LITTLTN 115.00] CKT 1 OPEN BRANCH FROM BUS 72748 [U199 TAP 115.00] TO BUS 72752 [WHITEFLD 115.00] CKT 1 OPEN BRANCH FROM BUS 72748 [U199 TAP 115.00] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72729 [LITTLTN 115.00] TO BUS 72748 [U199 TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72839 [N WDSTCK 34.500] TO BUS 72753 [WOODSTKH 115.00] CKT 1 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72753 [WOODSTKH 115.00] CKT 1

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)

Thermal Impact - POI-2 (Tapped E115 line)

1	2	3	4	5	6	7	8
Monitored Element	**Rating**	**Loading(%)**	**Rating**	**Loading(%)**	**(5)-(3)**		
**** From bus ** ** To bus ** CKT**	**MVA**	**Without Project**	**MVA**	**With Project**	**Impact (%)**	**Prior Outage**	**Contingency**
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1			193	98.2		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	92.1	193	98.3	6.21	Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1
71817 COMERFRD 230.00 71822 LITT TP4 230.00 1	193	93.6	193	96.3	2.66	Intact	PEMI_SB_1110 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1

D.2 N-1 Voltage Results

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72849 INTERVAL 115.00	0.9684	0.9775	0.9339	0.9698	-0.034	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72761 SACO VLY 115.00	0.9692	0.9784	0.9348	0.9707	-0.034	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72707 SAC_PAR2 115.00	0.9764	0.9964	0.9426	0.9871	-0.034	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72706 SACO_PAR 115.00	0.9718	0.9841	0.9376	0.9757	-0.034	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72767 ASHLAND 115.00	0.9615	0.9988	0.9486	0.9883	-0.013	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72728 LACONIA1 115.00	0.7839	0.971	0.7709	0.9675	-0.013	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72711 ASH TAP 115.00	0.962	0.9992	0.9493	0.989	-0.013	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72759 PEMI 115.00	0.951	0.9941	0.9395	0.9865	-0.011	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72708 LACONIA2 115.00	0.8804	0.9712	0.8711	0.9676	-0.009	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72749 WEBSTER 115.00	0.9206	0.9794	0.9127	0.976	-0.008	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72706 SACO_PAR 115.00	0.9532	0.9841	0.9463	0.9757	-0.007	Intact	L391 OPEN BRANCH FROM BUS 70090 [BUXTON 345.00] TO BUS 72693 [SCOB 345 345.00] CKT 1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72712 BEEBE 115.00	1.0453	1.0262	1.0528	1.0337	0.007	Intact	B-112 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1
72712 BEEBE 115.00	1.0453	1.0262	1.0528	1.0337	0.008	Intact	WHITELK_SB OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 2 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72706 [SACO_PAR 115.00] CKT 1
72712 BEEBE 115.00	1.04	1.0262	1.052	1.0337	0.012	Intact	PEMI_SB OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1
72712 BEEBE 115.00	1.0402	1.0262	1.0523	1.0337	0.012	Intact	E115 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN BRANCH FROM BUS 72831 [BRIDGEWATER 34.500] TO BUS 72767 [ASHLAND 115.00] CKT 1
72712 BEEBE 115.00	1.04	1.0262	1.052	1.0337	0.012	Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1
94000 Q345 COL 115.00			1.0521	1.0331		Intact	WHITELK_SB OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 2 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72706 [SACO_PAR 115.00] CKT 1
94000 Q345 COL 115.00			1.0521	1.0331		Intact	B-112 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1
94000 Q345 COL 115.00			1.0686	1.0331		Intact	Y138 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72707 [SAC_PAR2 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1
94000 Q345 COL 115.00			1.0699	1.0331		Intact	SACOVAL_SB OPEN BRANCH FROM BUS 72761 [SACO VLY 115.00] TO BUS 72849 [INTERVAL 115.00] CKT 1 OPEN BRANCH FROM BUS 72836 [SACO VLY 34.500] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
94000 Q345 COL 115.00			1.0515	1.0331		Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
94000 Q345 COL 115.00			1.0516	1.0331		Intact	E115 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN BRANCH FROM BUS 72831 [BRIDGEWATER 34.500] TO BUS 72767 [ASHLAND 115.00] CKT 1
94000 Q345 COL 115.00			1.0513	1.0331		Intact	PEMI_SB OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1
94000 Q345 COL 115.00			1.0513	1.0331		Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72753 WOODSTKH 115.00	1.0436	1.0241	1.0505	1.0314	0.007	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
94000 Q345 COL 115.00			1.0528	1.0279		Intact	WHITELK_SB OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 2 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72706 [SACO_PAR 115.00] CKT 1
94000 Q345 COL 115.00			1.0529	1.0279		Intact	B-112 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1
94000 Q345 COL 115.00			1.0599	1.0279		Intact	Y138 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72707 [SAC_PAR2 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1
94000 Q345 COL 115.00			1.061	1.0279		Intact	SACOVAL_SB OPEN BRANCH FROM BUS 72761 [SACO VLY 115.00] TO BUS 72849 [INTERVAL 115.00] CKT 1 OPEN BRANCH FROM BUS 72836 [SACO VLY 34.500] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
94000 Q345 COL 115.00			1.0584	1.0279		Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-2 (Tapped E115 line)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72849 INTERVAL 115.00	0.9684	0.9775	0.9352	0.9714	-0.033	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72761 SACO VLY 115.00	0.9692	0.9784	0.9361	0.9723	-0.033	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72707 SAC_PAR2 115.00	0.9764	0.9964	0.9439	0.989	-0.033	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72706 SACO_PAR 115.00	0.9718	0.9841	0.9389	0.9775	-0.033	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72728 LACONIA1 115.00	0.7839	0.971	0.776	0.9683	-0.008	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72759 PEMI 115.00	0.951	0.9941	0.944	0.9884	-0.007	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
94001 Q345 POI 115.00			1.052	1.0046		Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1
94001 Q345 POI 115.00			1.052	1.0046		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
94000 Q345 COL 115.00			1.0514	1.0042		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
94000 Q345 COL 115.00			1.0513	1.0042		Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88069 [Q305SUB35KV 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1
72712 BEEBE 115.00			1.0519	1.0098		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
72712 BEEBE 115.00			1.0558	1.0098		Intact	Q345-SB-2 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 94000 [Q345 COL 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1
72712 BEEBE 115.00			1.0559	1.0098		Intact	E115-N OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-2 (Tapped E115 line)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
70180 LOVELL 115.00			0.9796	0.9864		Intact	LOS_Q345_2 OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 94000 [Q345 COL 115.00] CKT 1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Voltage Impact - POI-2 (Tapped E115 line)							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
No significant Voltage Impact							

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)

Voltage Impact - POI-2 (Tapped E115 line)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72712 BEEBE 115.00	1.0483	1.0183	1.0564	1.0313	0.008	Intact	WHITELK_SB OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 2 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72706 [SACO_PAR 115.00] CKT 1
72712 BEEBE 115.00	1.0485	1.0183	1.0565	1.0313	0.008	Intact	B-112 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1
94001 Q345 POI 115.00			1.0601	1.0279		Intact	SACOVAL_SB OPEN BRANCH FROM BUS 72761 [SACO VLY 115.00] TO BUS 72849 [INTERVAL 115.00] CKT 1 OPEN BRANCH FROM BUS 72836 [SACO VLY 34.500] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
94001 Q345 POI 115.00			1.0526	1.0279		Intact	WHITELK_SB OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 2 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72706 [SACO_PAR 115.00] CKT 1
94001 Q345 POI 115.00			1.0527	1.0279		Intact	B-112 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1
94001 Q345 POI 115.00			1.0541	1.0279		Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
94001 Q345 POI 115.00			1.0591	1.0279		Intact	Y138 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72707 [SAC_PAR2 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1
94000 Q345 COL 115.00			1.0521	1.0274		Intact	B-112 OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1
94000 Q345 COL 115.00			1.0584	1.0274		Intact	Y138 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72707 [SAC_PAR2 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1
94000 Q345 COL 115.00			1.0594	1.0274		Intact	SACOVAL_SB OPEN BRANCH FROM BUS 72761 [SACO VLY 115.00] TO BUS 72849 [INTERVAL 115.00] CKT 1 OPEN BRANCH FROM BUS 72836 [SACO VLY 34.500] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
94000 Q345 COL 115.00			1.0534	1.0274		Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)

Voltage Impact - POI-2 (Tapped E115 line)

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
94000 Q345 COL 115.00			1.0519	1.0274		Intact	WHITELK_SB OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72751 [WHITE LK 115.00] TO BUS 72756 [TAMWTHTP 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72838 [WHITE LK 34.500] TO BUS 72751 [WHITE LK 115.00] CKT 2 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72751 [WHITE LK 115.00] CKT 1 OPEN BRANCH FROM BUS 72706 [SACO_PAR 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 72707 [SAC_PAR2 115.00] TO BUS 72706 [SACO_PAR 115.00] CKT 1
72712 BEEBE 115.00			1.0528	1.0313		Intact	Q345-SB-2 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 94000 [Q345 COL 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1
72712 BEEBE 115.00			1.0528	1.0313		Intact	E115-N OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1

D.3 Voltage Sensitivity Results

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72706 SACO_PAR 115.00	0.9751	0.9846	0.9366	0.977	-0.039	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72707 SAC_PAR2 115.00	0.9797	0.997	0.9416	0.988	-0.038	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72708 LACONIA2 115.00	0.8644	0.9717	0.8536	0.9675	-0.011	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72708 LACONIA2 115.00	0.9214	0.9717	0.9123	0.9675	-0.009	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72708 LACONIA2 115.00	0.9432	0.9717	0.9362	0.9675	-0.007	Intact	GARV_SB OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72807 [GARVINS 34.500] TO BUS 72721 [GARVINS 115.00] CKT 1 OPEN BRANCH FROM BUS 72807 [GARVINS 34.500] TO BUS 72721 [GARVINS 115.00] CKT 2 OPEN BRANCH FROM BUS 72718 [DEERFELD 115.00] TO BUS 72721 [GARVINS 115.00] CKT 1
72708 LACONIA2 115.00	0.944	0.9717	0.937	0.9675	-0.007	Intact	V182 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1
72711 ASH TAP 115.00	0.9464	1	0.9334	0.9886	-0.013	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72711 ASH TAP 115.00	0.9612	1	0.9473	0.9886	-0.014	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72728 LACONIA1 115.00	0.9212	0.9715	0.9121	0.9674	-0.009	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps

1		2	3	4	5	6	7	8
Monitored Element		**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus		**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72728 LACONIA1	115.00	0.9431	0.9715	0.936	0.9674	-0.007	Intact	GARV_SB OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72807 [GARVINS 34.500] TO BUS 72721 [GARVINS 115.00] CKT 1 OPEN BRANCH FROM BUS 72807 [GARVINS 34.500] TO BUS 72721 [GARVINS 115.00] CKT 2 OPEN BRANCH FROM BUS 72718 [DEERFELD 115.00] TO BUS 72721 [GARVINS 115.00] CKT 1
72728 LACONIA1	115.00	0.9439	0.9715	0.9369	0.9674	-0.007	Intact	V182 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1
72749 WEBSTER	115.00	0.907	0.9799	0.8981	0.9756	-0.009	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72749 WEBSTER	115.00	0.9312	0.9799	0.9224	0.9756	-0.009	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72759 PEMI	115.00	0.9326	0.995	0.92	0.9856	-0.013	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72759 PEMI	115.00	0.9508	0.995	0.9378	0.9856	-0.013	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72759 PEMI	115.00	0.9598	0.995	0.9492	0.9856	-0.011	Intact	P145 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1
72761 SACO VLY	115.00	0.9725	0.9789	0.9338	0.9719	-0.039	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72767 ASHLAND	115.00	0.9459	0.9996	0.9326	0.9879	-0.013	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72767 ASHLAND 115.00	0.9608	0.9996	0.9465	0.9879	-0.014	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72768 OAK HILL 115.00	0.9114	0.9935	0.9023	0.9914	-0.009	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72849 INTERVAL 115.00	0.9717	0.978	0.9329	0.9711	-0.039	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
88000 Q305 POI 115.00	0.9462	1.0206	0.9308	1.0097	-0.015	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-2 (Tapped E115 line) - with Q305 Caps

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72706 SACO_PAR 115.00	0.9751	0.9846	0.9388	0.9787	-0.036	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72707 SAC_PAR2 115.00	0.9797	0.997	0.9437	0.9899	-0.036	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72712 BEEBE 115.00			1.0526	1.0101		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
72712 BEEBE 115.00			1.0571	1.0101		Intact	Q345-SB-2 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 72712 [BEEBE 115.00] CKT 1 OPEN LINE FROM BUS 94001 [Q345 POI 115.00] TO BUS 94000 [Q345 COL 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1
72712 BEEBE 115.00			1.0571	1.0101		Intact	E115-N OPEN BRANCH FROM BUS 72712 [BEEBE 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1
72728 LACONIA1 115.00	0.7611	0.9715	0.7529	0.9684	-0.008	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
72759 PEMI 115.00	0.9508	0.995	0.9429	0.988	-0.008	Intact	MRMK_SB_23 OPEN BRANCH FROM BUS 72709 [MERMK230 230.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 72709 [MERMK230 230.00] CKT 1 OPEN BRANCH FROM BUS 71826 [DUNBARTN 230.00] TO BUS 71828 [N.LITCH2 230.00] CKT 1 OPEN BRANCH FROM BUS 71817 [COMERFRD 230.00] TO BUS 71826 [DUNBARTN 230.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72768 [OAK HILL 115.00] CKT 1 OPEN BRANCH FROM BUS 72734 [MERRMACK 115.00] TO BUS 72867 [MERMK G2 24.000] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 1 OPEN BRANCH FROM BUS 72722 [GREGGS 115.00] TO BUS 72734 [MERRMACK 115.00] CKT 2
72761 SACO VLY 115.00	0.9725	0.9789	0.936	0.9735	-0.037	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
72849 INTERVAL 115.00	0.9717	0.978	0.9351	0.9726	-0.037	Intact	214 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 72761 [SACO VLY 115.00] CKT 1 OPEN BRANCH FROM BUS 70180 [LOVELL 115.00] TO BUS 70103 [KIMBL RD 115.00] CKT 1
88000 Q305 POI 115.00	0.9462	1.0206	0.938	1.0124	-0.008	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3
94000 Q345 COL 115.00			1.0521	1.0044		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
94000 Q345 COL 115.00			1.0524	1.0044		Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88000 [Q305 POI 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1

Q345 Project - 2013 Peak Load, All Lines In Service (System Intact)

Voltage Impact - POI-2 (Tapped E115 line) - with Q305 Caps

1	2	3	4	5	6	7	8
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
94001 Q345 POI 115.00			1.0527	1.0047		Intact	E115-S OPEN BRANCH FROM BUS 94001 [Q345 POI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN BRANCH FROM BUS 72711 [ASH TAP 115.00] TO BUS 72759 [PEMI 115.00] CKT 1
94001 Q345 POI 115.00			1.0531	1.0047		Intact	E1150-SB-2 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72829 [PEMI 34.500] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 88000 [Q305 POI 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72711 [ASH TAP 115.00] CKT 1 OPEN LINE FROM BUS 72759 [PEMI 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 72767 [ASHLAND 115.00] CKT 1 OPEN LINE FROM BUS 72711 [ASH TAP 115.00] TO BUS 94001 [Q345 POI 115.00] CKT 1

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72708 LACONIA2 115.00	0.9576	1.0008	0.947	0.9938	-0.011	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3

Q345 Project - 2013 Shoulder Load, All Lines In Service (System Intact)							
Voltage Impact - POI-2 (Tapped E115 line) - with Q305 Caps							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
72708 LACONIA2 115.00	0.9576	1.0008	0.9483	0.9942	-0.009	Intact	WEBS_SB_2 OPEN BRANCH FROM BUS 72721 [GARVINS 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72728 [LACONIA1 115.00] TO BUS 72749 [WEBSTER 115.00] CKT 1 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 2 OPEN BRANCH FROM BUS 72837 [WEBSTER 34.500] TO BUS 72749 [WEBSTER 115.00] CKT 3

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)							
Voltage Impact - POI-1 (Beebe 115 kV) - with Q305 Caps							
1	2	3	4	5	6	7	8
Monitored Element	Without	Project	With	Project	(4)-(2)		
Bus	Vcon	Vinit	Vcon	Vinit	Impact	Prior Outage	Contingency
No significant Voltage Impact							

Q345 Project - 2013 Light Load, All Lines In Service (System Intact)							
Voltage Impact - POI-2 (Tapped E115 line) with Q305 caps							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Monitored Element	**Without**	**Project**	**With**	**Project**	**(4)-(2)**		
Bus	**Vcon**	**Vinit**	**Vcon**	**Vinit**	**Impact**	**Prior Outage**	**Contingency**
No significant Voltage Impact							

Appendix

E

Project IDEV Files

E.1 Interconnection to Beebe River 115 kV (POI – 1)

```
RDCH
1
94000,'Q345 POI', 115.0000,1,     0.000,     0.000, 101, 565,1.05000,  40.0000,   1
94005,'Q345 COL',  34.5000,1,     0.000,     0.000, 101, 565,1.01679,  47.3685,   1
94010,'Q345 SY1',  34.5000,1,     0.000,     0.000, 101, 565,1.04156,  53.2800,   1
94015,'Q345 SY2',  34.5000,1,     0.000,     0.000, 101, 565,1.04165,  53.6107,   1
94020,'OH 1',  34.5000,1,     0.000,     0.000, 101, 565,1.04424,  53.8209,   1
94025,'WTG-N6',  34.5000,1,     0.000,     0.000, 101, 565,1.04624,  53.9456,   1
94030,'WTG-N6',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.0840,   1
94035,'WTG-N1',  34.5000,1,     0.000,     0.000, 101, 565,1.04914,  54.0431,   1
94040,'WTG-N1',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.1814,   1
94045,'WTG-N2',  34.5000,1,     0.000,     0.000, 101, 565,1.05145,  54.1225,   1
94050,'WTG-N2',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.2607,   1
94055,'WTG-N3',  34.5000,1,     0.000,     0.000, 101, 565,1.05202,  54.1426,   1
94060,'WTG-N3',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.2807,   1
94065,'WTG-N4',  34.5000,1,     0.000,     0.000, 101, 565,1.05280,  54.1607,   1
94070,'WTG-N4',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.2988,   1
94075,'WTG-N5',  34.5000,1,     0.000,     0.000, 101, 565,1.05319,  54.1698,   1
94080,'WTG-N5',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.3079,   1
94085,'WTG-W1',  34.5000,1,     0.000,     0.000, 101, 565,1.04424,  53.8209,   1
94090,'WTG-W1',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  58.9593,   1
94095,'WTG-W2',  34.5000,1,     0.000,     0.000, 101, 565,1.04466,  53.8450,   1
94100,'WTG-W2',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  58.9834,   1
94105,'WTG-W3',  34.5000,1,     0.000,     0.000, 101, 565,1.04545,  53.8690,   1
94110,'WTG-W3',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.0074,   1
94115,'WTG-W4',  34.5000,1,     0.000,     0.000, 101, 565,1.04605,  53.8871,   1
94120,'WTG-W4',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.0255,   1
94125,'WTG-W5',  34.5000,1,     0.000,     0.000, 101, 565,1.04762,  53.9183,   1
94130,'WTG-W5',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.0566,   1
94135,'WTG-W6',  34.5000,1,     0.000,     0.000, 101, 565,1.04801,  53.9263,   1
94140,'WTG-W6',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.0646,   1
94145,'OH 2',  34.5000,1,     0.000,     0.000, 101, 565,1.04546,  54.3834,   1
94150,'WTG-E2',  34.5000,1,     0.000,     0.000, 101, 565,1.04546,  54.3834,   1
94155,'WTG-E2',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.5218,   1
94160,'WTG-E3',  34.5000,1,     0.000,     0.000, 101, 565,1.04579,  54.3932,   1
94165,'WTG-E3',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.5316,   1
94170,'WTG-E6',  34.5000,1,     0.000,     0.000, 101, 565,1.04681,  54.5254,   1
94175,'WTG-E6',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.6638,   1
94180,'JUNCTION',  34.5000,1,     0.000,     0.000, 101, 565,1.04681,  54.5254,   1
94185,'WTG-E5',  34.5000,1,     0.000,     0.000, 101, 565,1.04759,  54.5411,   1
94190,'WTG-E5',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.6794,   1
94195,'WTG-E4',  34.5000,1,     0.000,     0.000, 101, 565,1.04799,  54.5490,   1
94200,'WTG-E4',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.6873,   1
94205,'WTG-E7',  34.5000,1,     0.000,     0.000, 101, 565,1.04720,  54.5570,   1
94210,'WTG-E7',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.6954,   1
94215,'WTG-E8',  34.5000,1,     0.000,     0.000, 101, 565,1.04769,  54.5868,   1
94220,'WTG-E8',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.7251,   1
94225,'WTG-E9',  34.5000,1,     0.000,     0.000, 101, 565,1.04809,  54.6117,   1
94230,'WTG-E9',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.7500,   1
94235,'WTG-E10',  34.5000,1,     0.000,     0.000, 101, 565,1.04886,  54.6372,   1
94240,'WTG-E10',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.7754,   1
94245,'WTG-E11',  34.5000,1,     0.000,     0.000, 101, 565,1.04945,  54.6564,   1
94250,'WTG-E11',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.7947,   1
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94255,'JUNCTION',  34.5000,1,     0.000,     0.000, 101, 565,1.04945,  54.6564,   1
94260,'WTG-E12',  34.5000,1,     0.000,     0.000, 101, 565,1.05100,  54.6907,   1
94265,'WTG-E12',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.8288,   1
94270,'WTG-E13',  34.5000,1,     0.000,     0.000, 101, 565,1.05139,  54.6994,   1
94275,'WTG-E13',   0.6900,2,     0.000,     0.000, 101, 565,1.05000,  59.8376,   1
 0 / END OF BUS DATA, BEGIN LOAD DATA
 0 / END OF LOAD DATA, BEGIN GENERATOR DATA
94030,'1 ',     2.000,    -0.007,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94040,'1 ',     2.000,    -0.069,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94050,'1 ',     2.000,    -0.118,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94060,'1 ',     2.000,    -0.130,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94070,'1 ',     2.000,    -0.147,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94080,'1 ',     2.000,    -0.155,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94090,'1 ',     2.000,     0.035,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94100,'1 ',     2.000,     0.027,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94110,'1 ',     2.000,     0.010,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94120,'1 ',     2.000,    -0.003,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94130,'1 ',     2.000,    -0.036,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94140,'1 ',     2.000,    -0.045,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94155,'1 ',     2.000,     0.010,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94165,'1 ',     2.000,     0.002,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94175,'1 ',     2.000,    -0.019,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94190,'1 ',     2.000,    -0.036,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94200,'1 ',     2.000,    -0.044,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94210,'1 ',     2.000,    -0.028,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94220,'1 ',     2.000,    -0.038,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94230,'1 ',     2.000,    -0.046,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
94240,'1 ',     2.000,    -0.063,     0.660,    -0.660,1.05000,    0,     2.000,
0.009494,   0.2128076,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
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94250,'1 ',     2.000,     -0.075,      0.660,     -0.660,1.05000,     0,      2.000,
0.009494,    0.2128076,    0.00000,    0.00000,1.00000,1,  100.0,      2.000,      0.000,
1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94265,'1 ',     2.000,     -0.108,      0.660,     -0.660,1.05000,     0,      2.000,
0.009494,    0.2128076,    0.00000,    0.00000,1.00000,1,  100.0,      2.000,      0.000,
1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94275,'1 ',     2.000,     -0.117,      0.660,     -0.660,1.05000,     0,      2.000,
0.009494,    0.2128076,    0.00000,    0.00000,1.00000,1,  100.0,      2.000,      0.000,
1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
 0 / END OF GENERATOR DATA, BEGIN NON-TRANSFORMER BRANCH DATA
72712, 94000,'1 ',    0.00008,    0.00495,    0.00007,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94005, 94010,'1 ',    0.17995,    0.44255,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94005, 94015,'1 ',    0.18744,    0.46684,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94010, 94020,'1 ',    0.01606,    0.04176,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94015, 94145,'1 ',    0.02294,    0.05965,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94020, 94025,'1 ',    0.01974,    0.01773,    0.00139,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94020, 94085,'1 ',    0.00000,    0.00010,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94025, 94035,'1 ',    0.03266,    0.01449,    0.00076,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94035, 94045,'1 ',    0.03266,    0.01449,    0.00076,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94045, 94055,'1 ',    0.01089,    0.00483,    0.00025,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94055, 94065,'1 ',    0.02121,    0.00541,    0.00021,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94065, 94075,'1 ',    0.02121,    0.00541,    0.00021,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94085, 94095,'1 ',    0.00474,    0.00426,    0.00033,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94095, 94105,'1 ',    0.01089,    0.00483,    0.00025,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94105, 94115,'1 ',    0.01089,    0.00483,    0.00025,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94115, 94125,'1 ',    0.04242,    0.01083,    0.00042,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94125, 94135,'1 ',    0.02121,    0.00541,    0.00021,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94145, 94150,'1 ',    0.00000,    0.00010,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94145, 94170,'1 ',    0.00847,    0.01284,    0.00146,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94150, 94160,'1 ',    0.01815,    0.00805,    0.00043,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94170, 94180,'1 ',    0.00000,    0.00010,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94180, 94185,'1 ',    0.02121,    0.00541,    0.00021,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94180, 94205,'1 ',    0.00339,    0.00399,    0.00039,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94185, 94195,'1 ',    0.02121,    0.00541,    0.00021,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94205, 94215,'1 ',    0.00474,    0.00426,    0.00033,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94215, 94225,'1 ',    0.00474,    0.00426,    0.00033,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94225, 94235,'1 ',    0.01089,    0.00483,    0.00025,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94235, 94245,'1 ',    0.01089,    0.00483,    0.00025,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94245, 94255,'1 ',    0.00000,    0.00010,    0.00000,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
94255, 94260,'2 ',    0.04242,    0.01083,    0.00042,     0.00,     0.00,     0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,    0.00,    1,1.0000,    0,0.0000,    0,0.0000,    0,0.0000
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94260, 94270,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,  0.00000,
0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000,   0,0.0000,   0,0.0000,   0,0.0000
 0 / END OF NON-TRANSFORMER BRANCH DATA, BEGIN TRANSFORMER DATA
94000,94005,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.01000,   0.29983,   30.00
1.00000,   0.000,   0.000,   30.00,   30.00,   50.00, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94025,94030,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94035,94040,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94050,94045,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94060,94055,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94070,94065,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94080,94075,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94090,94085,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94100,94095,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94105,94110,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94115,94120,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94125,94130,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
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   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94135,94140,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94150,94155,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94160,94165,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94175,94170,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94190,94185,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94195,94200,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94205,94210,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94215,94220,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94225,94230,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94235,94240,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94245,94250,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
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94260,94265,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
94270,94275,    0,'1 ',1,1,1,   0.00000,   0.00000,2,'        ',1,   1,1.0000,
0,0.0000,   0,0.0000,   0,0.0000
   0.43532,   4.91702,    2.35
1.00000,   0.000,   0.000,    2.35,    2.35,    2.35, 0,     0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 0 / END OF TRANSFORMER DATA, BEGIN AREA INTERCHANGE DATA
 Q
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E.2 Interconnection to Beebe-Ashland Tap 115 kV Line (POI – 2)

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rdch
1
 94000,'Q345 POI', 115.0000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94001,'Q345 TAP', 115.0000,1,     0.000,     0.000, 101, 560,1.00342, -40.7345,   1
 94005,'Q345 COL',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94010,'Q345 SY1',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94015,'Q345 SY2',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94020,'OH 1        ',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,
1
 94025,'WTG-N6',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94030,'WTG-N6',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94035,'WTG-N1',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94040,'WTG-N1',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94045,'WTG-N2',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94050,'WTG-N2',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94055,'WTG-N3',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94060,'WTG-N3',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94065,'WTG-N4',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94070,'WTG-N4',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94075,'WTG-N5',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94080,'WTG-N5',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94085,'WTG-W1',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94090,'WTG-W1',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94095,'WTG-W2',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94100,'WTG-W2',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94105,'WTG-W3',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94110,'WTG-W3',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94115,'WTG-W4',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94120,'WTG-W4',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94125,'WTG-W5',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94130,'WTG-W5',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94135,'WTG-W6',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94140,'WTG-W6',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94145,'OH 2        ',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,
1
 94150,'WTG-E2',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94155,'WTG-E2',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94160,'WTG-E3',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94165,'WTG-E3',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94170,'WTG-E6',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94175,'WTG-E6',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94180,'JUNCTION 1  ',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,
1
 94185,'WTG-E5',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94190,'WTG-E5',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94195,'WTG-E4',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94200,'WTG-E4',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94205,'WTG-E7',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94210,'WTG-E7',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94215,'WTG-E8',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94220,'WTG-E8',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94225,'WTG-E9',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
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 94230,'WTG-E9',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94235,'WTG-E10',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94240,'WTG-E10',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94245,'WTG-E11',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94250,'WTG-E11',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94255,'JUNCTION 2  ',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,
1
 94260,'WTG-E12',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94265,'WTG-E12',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94270,'WTG-E13',  34.5000,1,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
 94275,'WTG-E13',   0.6900,2,     0.000,     0.000, 101, 565,1.00000,   -40.0000,   1
0 / END OF BUS DATA, BEGIN LOAD DATA
0 / END OF LOAD DATA, BEGIN GENERATOR DATA
 94030,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94040,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94050,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94060,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94070,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94080,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94090,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94100,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94110,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94120,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94130,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94140,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94155,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94165,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94175,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94190,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94200,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94210,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94220,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
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 94230,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94240,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94250,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94265,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
 94275,'1 ',     2.000,     0.000,     0.660,    -0.660,1.05000,     0,     2.0,
0.00000,   0.14600,   0.00000,   0.00000,1.00000,1,  100.0,     2.000,     0.000,
1,1.0000
0 / END OF GENERATOR DATA, BEGIN BRANCH DATA
 72711,  94001,'1 ',   0.01385,   0.03994,   0.00463,  130.00,  140.00,  160.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00, 102,1.0000
 72712, -94001,'1 ',   0.00746,   0.02151,   0.00250,  130.00,  140.00,  160.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00, 102,1.0000
 94000, -94001,'1 ',   0.00008,   0.00495,   0.00007,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94005,  94010,'1 ',   0.13178,   0.31728,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94005,  94015,'1 ',   0.13927,   0.34157,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94010,  94020,'1 ',   0.01606,   0.04176,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94015,  94145,'1 ',   0.02294,   0.05965,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94020,  94025,'1 ',   0.01974,   0.01773,   0.00139,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94020,  94085,'1 ',   0.00000,   0.00010,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94025,  94035,'1 ',   0.03266,   0.01449,   0.00076,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94035,  94045,'1 ',   0.03266,   0.01449,   0.00076,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94045,  94055,'1 ',   0.01089,   0.00483,   0.00025,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94055,  94065,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94065,  94075,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94085,  94095,'1 ',   0.00474,   0.00426,   0.00033,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94095,  94105,'1 ',   0.01089,   0.00483,   0.00025,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94105,  94115,'1 ',   0.01089,   0.00483,   0.00025,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94115,  94125,'1 ',   0.04242,   0.01083,   0.00042,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94125,  94135,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94145,  94150,'1 ',   0.00000,   0.00010,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94145,  94170,'1 ',   0.00847,   0.01284,   0.00146,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94150,  94160,'1 ',   0.01815,   0.00805,   0.00043,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94170,  94180,'1 ',   0.00000,   0.00010,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94180,  94185,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94180,  94205,'1 ',   0.00339,   0.00399,   0.00039,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94185,  94195,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94205,  94215,'1 ',   0.00474,   0.00426,   0.00033,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
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 94215,  94225,'1 ',   0.00474,   0.00426,   0.00033,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94225,  94235,'1 ',   0.01089,   0.00483,   0.00025,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94235,  94245,'1 ',   0.01089,   0.00483,   0.00025,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94245,  94255,'1 ',   0.00000,   0.00010,   0.00000,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94255,  94260,'2 ',   0.04242,   0.01083,   0.00042,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
 94260,  94270,'1 ',   0.02121,   0.00541,   0.00021,    0.00,    0.00,    0.00,
0.00000,  0.00000,  0.00000,  0.00000,1,   0.00,   1,1.0000
0 / END OF BRANCH DATA, BEGIN TRANSFORMER DATA
 94000, 94005,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.00300,   0.08995,    30.00
1.00000,   0.000,   0.000,    30.00,    30.00,    50.00, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94025, 94030,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94035, 94040,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94050, 94045,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94060, 94055,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94070, 94065,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94080, 94075,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94090, 94085,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94100, 94095,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94105, 94110,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94115, 94120,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94125, 94130,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
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1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94135, 94140,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94150, 94155,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94160, 94165,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94175, 94170,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94190, 94185,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94195, 94200,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94205, 94210,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94215, 94220,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94225, 94230,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94235, 94240,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94245, 94250,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94260, 94265,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
 94270, 94275,     0,'1 ',1,2,1,   0.00000,   0.00000,2,'            ',1,   1,1.0000
   0.01023,   0.11555,     2.35
1.00000,   0.000,   0.000,     2.35,     2.35,     2.35, 0,      0, 1.10000, 0.90000,
1.10000, 0.90000,  33, 0, 0.00000, 0.00000
1.00000,   0.000
0 / END OF TRANSFORMER DATA, BEGIN AREA DATA
q
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Appendix

F

Short Circuit Report by PSNH

Northeast
Utilities System

NU Transmission Group

Project Queue 345
Short Circuit & PSNH Circuit Breaker Duty Study

Introduction

Short circuit studies and Breaker Ratings studies were performed to determine the effect of the 48MW wind powered facility ISO-NE Queue #345, on the PSNH transmission system. The short circuit levels and adequacy of the existing PSNH circuit breakers were examined as part of the study. The program used for the analysis was ASPEN OneLiner short circuit program.

Summary

The addition of the 48MW wind powered facility for either proposed connection will not cause any PSNH Transmission breakers to become overdutied or exceed 80% of their current rating. For all breaker rating studies, a pre-fault voltage of 1.05pu is used.

Study Models

The following ASPEN OneLiner cases were used for this study:

Pre-Queue 345.olr: This base case represents the present transmission system along with the following proposed generation and projects:

South Southern Loop (aka Coolidge Connector) Project
Western Massachusetts Transmission Reinforcements (NEEWS)
Long Island Replacement Cable
Norwalk-Glenbrook Cables
Haddam 345/115-kV autotransformer
Barbour Hill 345/115-kV autotransformer
Killingly 345/115-kV autotransformer
Northern Reliability Interconnect Project (NRI)
Heywood Road – ME
Maguire Road – ME
Y138 Closing – ME
Rumford-Woodstock-Kimball Road – ME
Rumford Falls Hydro Interconnection – ME
Hancock County & Downeast – ME
Keene Road Autotransformer – ME
Monadnock Project
Bethel-Norwalk Project
Middletown-Norwalk Transmission Project
Second Deerfield Autotransformer
Queues 166, 197, 228, 229, 244, and 251

Post-Queue 345 POI-1.olr: This case includes everything from the Pre-Queue 345 case as well as the 48MW wind powered facility, ISO-NE Queue 345 connected to Beebe River S/S.

Post-Queue 345 POI-2.olr: This case includes everything from the Pre-Queue 345 case as well as the 48MW wind powered facility, ISO-NE Queue 345 connected to a new substation that splits the E115 line from Beebe River to Pemigewasset.

Study Results

1. PSNH Base Case Breaker Duty (Pre-Queue 345)

BUS	BREAKER	3LG AMPS	1LG AMPS	Interrupting % DUTY	Momentary % DUTY	FLAGS
BEEBE RIVER 115	B112	5887.5	3790.8	10.9	8.7	
BEEBE RIVER 115	E115	5887.5	3790.8	8.5	7.0	
BEEBE RIVER 115	X178	5887.5	3790.8	10.2	8.1	
BERLIN 115	S136	7233.4	8180.0	17.2	15.6	
BERLIN 115	W179	7233.4	8180.0	17.4	15.9	
LITTLETON 115	601	10211.5	9825.3	29.9	36.4	
LITTLETON 115	6099	10211.5	9825.3	22.3	28.7	
LITTLETON 115	952	10211.5	9825.3	32.2	39.4	
LITTLETON 115	992	10211.5	9825.3	26.8	32.8	
LOST NATION 115	D142	5009.5	3936.3	7.8	6.2	
PEMIGEWASSET 115	E1150	7013.7	4746.2	12.2	9.9	
SACO VALLEY 115	C106	4445.8	2706.3	11.1	9.5	
WEBSTER 115	A111	10112.6	6923.1	19.9	17.8	
WEBSTER 115	BT40	10112.6	6923.1	25.3	22.2	
WEBSTER 115	F139	10112.6	6923.1	46.7	62.5	
WEBSTER 115	J1250	10112.6	6923.1	25.3	22.2	
WEBSTER 115	L176	10112.6	6923.1	22.5	30.1	
WEBSTER 115	M127	10112.6	6923.1	19.6	24.9	
WEBSTER 115	V182	10112.6	6923.1	18.4	15.5	
WHITE LAKE 115	B1120	4601.9	2866.1	6.0	5.3	
WHITE LAKE 115	Y1380	4601.9	2866.1	7.0	6.3	
WHITEFIELD 115	D1420	7927.3	6243.3	17.8	15.5	
WHITEFIELD 115	Q1950	7927.3	6243.3	15.7	13.6	
WHITEFIELD 115	S1360	7927.3	6243.3	16.8	14.3	
WHITEFIELD 115	X1780	7927.3	6243.3	16.2	13.7	

Flags:
W1 – BREAKER INTERRUPTING DUTY EXCEEDS 80% OF RATING
W2 – BREAKER MOMENTARY (CLOSE-AND-LATCH) CURRENT DUTY EXCEEDS 80% OF RATING

2. PSNH Post - Queue 345 POI-1 Breaker Duty

After introducing the 48MW wind powered facility at Beebe River S/S, no PSNH breakers become overdutied or exceed 80% of their current rating.

BUS	BREAKER	3LG AMPS	1LG AMPS	Interrupting % DUTY	Momentary % DUTY	FLAGS
BEEBE RIVER 115	B112	6403	8799.2	18.4	15.0	
BEEBE RIVER 115	E115	6403	8799.2	16.1	13.1	
BEEBE RIVER 115	X178	6403	8799.2	17.6	14.4	
BERLIN 115	S136	7240.4	8188	17.2	15.6	
BERLIN 115	W179	7240.4	8188	17.4	15.9	
LITTLETON 115	601	10261.5	9918.8	30.0	36.6	
LITTLETON 115	6099	10261.5	9918.8	22.4	28.8	
LITTLETON 115	952	10261.5	9918.8	32.4	39.6	
LITTLETON 115	992	10261.5	9918.8	26.9	33.0	
LOST NATION 115	D142	5016.3	3945.4	7.9	6.2	
PEMIGEWASSET 115	E1150	7166.3	5556.1	12.2	9.9	
SACO VALLEY 115	C106	4495	2949.4	11.2	9.6	
WEBSTER 115	A111	10190.4	7266.3	19.9	17.8	
WEBSTER 115	BT40	10190.4	7266.3	25.5	22.3	
WEBSTER 115	F139	10190.4	7266.3	47.1	63.0	
WEBSTER 115	J1250	10190.4	7266.3	25.5	22.3	
WEBSTER 115	L176	10190.4	7266.3	22.6	30.2	
WEBSTER 115	M127	10190.4	7266.3	19.7	25.1	
WEBSTER 115	V182	10190.4	7266.3	18.6	15.6	
WHITE LAKE 115	B1120	4700.7	3410.9	6.3	5.5	
WHITE LAKE 115	Y1380	4700.7	3410.9	7.2	6.5	
WHITEFIELD 115	D1420	7958.9	6306.7	17.9	15.6	
WHITEFIELD 115	Q1950	7958.9	6306.7	15.7	13.7	
WHITEFIELD 115	S1360	7958.9	6306.7	16.9	14.4	
WHITEFIELD 115	X1780	7958.9	6306.7	16.2	13.7	

Flags:

W1 – BREAKER INTERRUPTING DUTY EXCEEDS 80% OF RATING

W2 – BREAKER MOMENTARY (CLOSE-AND-LATCH) CURRENT DUTY EXCEEDS 80% OF RATING

3. PSNH Post - Queue 345 POI-2 Breaker Duty

After introducing the 48MW wind powered facility on the E115 line, no PSNH breakers become overdutied or exceed 80% of their current rating.

BUS	BREAKER	3LG AMPS	1LG AMPS	Interrupting % DUTY	Momentary % DUTY	FLAGS
BEEBE RIVER 115	B112	6316.2	6836.5	13.9	10.6	
BEEBE RIVER 115	E115	6316.2	6836.5	10.1	7.7	
BEEBE RIVER 115	X178	6316.2	6836.5	13.3	10.1	
BERLIN 115	S136	7239.4	8186.7	17.2	15.6	
BERLIN 115	W179	7239.4	8186.7	17.4	15.9	
LITTLETON 115	601	10254.3	9900.2	30.0	36.6	
LITTLETON 115	6099	10254.3	9900.2	22.4	28.8	
LITTLETON 115	952	10254.3	9900.2	32.3	39.6	
LITTLETON 115	992	10254.3	9900.2	26.9	32.9	
LOST NATION 115	D142	5015.3	3943.5	7.9	6.2	
PEMIGEWASSET 115	E1150	7227.5	5825.4	12.2	9.9	
SACO VALLEY 115	C106	4487.2	2891.8	11.2	9.5	
WEBSTER 115	A111	10221.1	7367.1	19.9	17.8	
WEBSTER 115	BT40	10221.1	7367.1	25.6	22.4	
WEBSTER 115	F139	10221.1	7367.1	47.3	63.3	
WEBSTER 115	J1250	10221.1	7367.1	25.6	22.4	
WEBSTER 115	L176	10221.1	7367.1	22.7	30.3	
WEBSTER 115	M127	10221.1	7367.1	19.8	25.2	
WEBSTER 115	V182	10221.1	7367.1	18.7	15.7	
WHITE LAKE 115	B1120	4684.8	3272.7	6.3	5.5	
WHITE LAKE 115	Y1380	4684.8	3272.7	7.2	6.4	
WHITEFIELD 115	D1420	7954.2	6293.4	17.9	15.5	
WHITEFIELD 115	Q1950	7954.2	6293.4	15.7	13.7	
WHITEFIELD 115	S1360	7954.2	6293.4	16.9	14.3	
WHITEFIELD 115	X1780	7954.2	6293.4	16.2	13.7	

Flags:

W1 – BREAKER INTERRUPTING DUTY EXCEEDS 80% OF RATING

W2 – BREAKER MOMENTARY (CLOSE-AND-LATCH) CURRENT DUTY EXCEEDS 80% OF RATING

4. Fault Current Level Changes with Addition of Queue 345

	Pre-Queue 345		Queue POI-1		Queue POI-2	
BUS	3LG AMPS	1LG AMPS	3LG AMPS	1LG AMPS	3LG AMPS	1LG AMPS
ASHLAND 115	5844.1	3771.9	6075.2	5194.5	6169.6	5776.6
ASHLAND TAP 115	6042.1	3909.3	6290.6	5459.2	6392.2	6105.4
BEEBE RIVER 115	5887.5	3790.8	6403	8799.2	6316.2	6836.5
BERLIN 115	7233.4	8180	7240.4	8188	7239.4	8186.7
LITTLETON 115	10211.5	9825.3	10261.5	9918.8	10254.3	9900.2
LOST NATION 115	5009.5	3936.3	5016.3	3945.4	5015.3	3943.5
N WOODSTOCK 115	5069	3286.1	5256	4279.6	5226	4014.5
PEMIGEWASSET 115	7013.7	4746.2	7166.3	5556.1	7227.5	5825.4
SACO VALLEY 115	4445.8	2706.3	4495	2949.4	4487.2	2891.8
TAMWORTH TAP 115	4606.8	2874.7	4707.5	3431	4691.4	3289.6
WEBSTER 115	10112.6	6923.1	10190.4	7266.3	10221.1	7367.1
WHITE LAKE 115	4601.9	2866.1	4700.7	3410.9	4684.8	3272.7
WHITEFIELD 115	7927.3	6243.3	7958.9	6306.7	7954.2	6293.4

Substations that experienced an increase in fault current of more than 10% can be seen below in red.

	Queue 345 POI-1		Queue 345 POI-2	
BUS	3LG % CHANGE	1LG %CHANGE	3LG % CHANGE	1LG %CHANGE
ASHLAND 115	3.95%	37.72%	5.57%	53.15%
ASHLAND TAP 115	4.11%	39.65%	5.79%	56.18%
BEEBE RIVER 115	8.76%	132.12%	7.28%	80.34%
BERLIN 115	0.10%	0.10%	0.08%	0.08%
LITTLETON 115	0.49%	0.95%	0.42%	0.76%
LOST NATION 115	0.14%	0.23%	0.12%	0.18%
N WOODSTOCK 115	3.69%	30.23%	3.10%	22.17%
PEMIGEWASSET 115	2.18%	17.06%	3.05%	22.74%
SACO VALLEY 115	1.11%	8.98%	0.93%	6.85%
TAMWORTH TAP 115	2.19%	19.35%	1.84%	14.43%
WEBSTER 115	0.77%	4.96%	1.07%	6.41%
WHITE LAKE 115	2.15%	19.01%	1.80%	14.19%
WHITEFIELD 115	0.40%	1.02%	0.34%	0.80%

Geiger, Susan S.

From:	Cherian, Ed [Echerian@iberdrolaren.com]
Sent:	Wednesday, May 25, 2011 4:12 PM
To:	Geiger, Susan S.
Cc:	Goland, Kristen
Subject:	FW: Completed Groton Wind Farm Feasibility Study Report Q345
Attachments:	R105-10 Draft Q345 Feasibility Study Report-Rev2.pdf

From: Sawabi, Aaron [mailto:asawabi@iso-ne.com]
Sent: 2011-05-25 16:05
To: Shields, Tom; Cherian, Ed; Hammond, Don; Varughese, Jebby
Cc: Zhang, Jinlin
Subject: Completed Groton Wind Farm Feasibility Study Report Q345

Tom et. al.,

This email is to confirm that the attached report represents the completed Feasibility Study for Q345. It is labeled "draft" to indicate a procedural status within our process but for all intents and purposes, the study is complete.

Aaron Sawabi
ISO New England, Inc.
Project Manager, Transmission Planning
413-540-4639