Kibby Wind Power Project
Feasibility Study

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Prepared by:

Engineering & Environmental Consulting, LLC

For ISO New England Inc. and Central Maine Power

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EXECUTIVE SUMMARY

E/PRO Engineering & Environmental Consulting, LLC (E/PRO) has conducted an Interconnection Feasibility Study (the "Study") under the ISO New England Inc. Open Access Transmission Tariff (the "Tariff") on behalf of ISO New England Inc. and Central Maine Power Company ("CMP"), for TransCanada to construct a 130MW wind farm in the Boundary Mountains of northwestern Maine and will be known as the Kibby Mountain Wind Farm Project (the "Project").

The Study was performed in accordance with the ISO New England Operating Documents, including the Interconnection Procedures contained in Schedule 22 of the Tariff. Pursuant to Schedule 22, the Study was performed as a separate and distinct study from the Interconnection System Impact Study ("ISIS"). If the Interconnection Customer pursues an ISIS, the ISIS report will include the results of the Study. The ISIS may not require any additional steady-state analysis.

The Study includes: (i) assessing thermal overloads and voltage limit violations resulting from the interconnection; and (ii) assessing circuit breaker short circuit capability limits exceeded as a result of the interconnection. The ISIS will finalize these results; and also will identify any instability or inadequately damped response to system disturbances resulting from the interconnection. E/PRO also performed the short-circuit analysis included in the Study.

The purpose of the Study was to:

(i) Analyze the steady-state conditions for the Project;

(ii) Determine any upgrades to the transmission system that would be required to mitigate any adverse impacts that the Project could otherwise pose on the reliability and operating characteristics of the [redundant - - - A-2 deals with the BPS] Bulk Power transmission system in accordance with the Northeast Power Coordinating Council (NPCC) *Document A-2 "Basic Criteria for Design and Operation of Interconnected Power Systems"*, the ISO New England Planning Procedure No. 3, "*Reliability Standards for the New England Area Bulk Power System*" and the ISO New England Planning Procedure No. 5-3, *"Guidelines for Conducting and Evaluating Proposed Plan Application Analyses; "* and

(iii) Determine any upgrades required to mitigate any degradation to transmission transfer capability under ISO New England Planning Procedure No. 5-6, *"Scope of Study for System Impact Studies under the Minimum Interconnection Standard."*

Under the Minimum Interconnection Standards, the Study is performed to determine the additions or modifications needed to interconnect in a manner that avoids any significant adverse effect on the system reliability, stability, and operability while protecting against any degradation in transfer capability.

Based on this standard, re-dispatch equal to the size of the proposed capacity requested for the Project was specified in the scope of studies as follows:

- Re-dispatch with Stratton Energy Associates and the Redington Windfarm with the point of interconnection at CMP's Bigelow S/S

The Project was dispatched against the Stratton Energy Associates Biomass facility (45MW) and the Redington Mountain Wind Farm (90MW). Sensitivity analysis was also performed for generator and transmission projects either ahead of the Project in the ISO-NE generator interconnection request queue or has an approved proposed plan application. The sensitivities were conducted for the GenPower Athens Energy (generator), and the Northeast Reliability Interconnect (NRI), and also the Y138 Closing Project (both transmission). The results of steady-state analysis showed negligible change in thermal overloads and minor degradation of station voltages with the Project. To mitigate the voltage impacts, three approaches were researched: 1) addition of capacitors at the Project substation, 2) addition of capacitors at a CMP 115 kV substation and 3) addition or expansion of low-voltage capacitor banks at multiple locations. The cost estimate for either of these options is $1.2 million.

This analysis demonstrates the Project meets the Minimum Interconnection Standard required to interconnect the proposed generation resource without substantial system upgrades.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

TransCanada Energy Ltd. has proposed to place a 130.5 MW wind farm, consisting of 87 GE Model 1.5SE wind turbine-generators in the Kibby and Skinner Townships in Franklin County, Maine. Kibby Wind Power Project ("the Project") is proposed to interconnect to the Central Maine Power (CMP) 115kV transmission system at the Bigelow substation located in Carrabasset Valley, Maine. This project has a proposed in service date of December 2008.

EPRO was engaged to perform an Interconnection Feasibility Study to assess the voltage, thermal, and short-circuit response resulting from the placement of 130.5MW of net generation into Bigelow substation.

1.2 PROJECT DESCRIPTION

TransCanada Energy Ltd. has proposed a wind farm project with an interconnection request for 130.5 MW with an in-service date of December 2008. Refer to APPENDIX F - Kibby Project Equivalent One Line for a project one line diagram. The Project consists of:

- Four collector strings; three strings with 21 General Electric model 1.5se wind turbines and one string with 24 General Electric model 1.5se wind turbines.
- Each generator will operate at 575 volts, and will be equipped with its own dedicated 575/34,500 V GSU.
- Each of the four collector strings, each three to four miles in length will operate at 34.5 kV nominal. The four collector lines will tie into one 34.5 kV collector bus at the main substation to be constructed by TransCanada.
- A single 34.5/115 kV step up transformer will connect from the 34.5 kV bus directly to a 115 kV line that will interconnect to the CMP transmission system (see Figure 1 below).

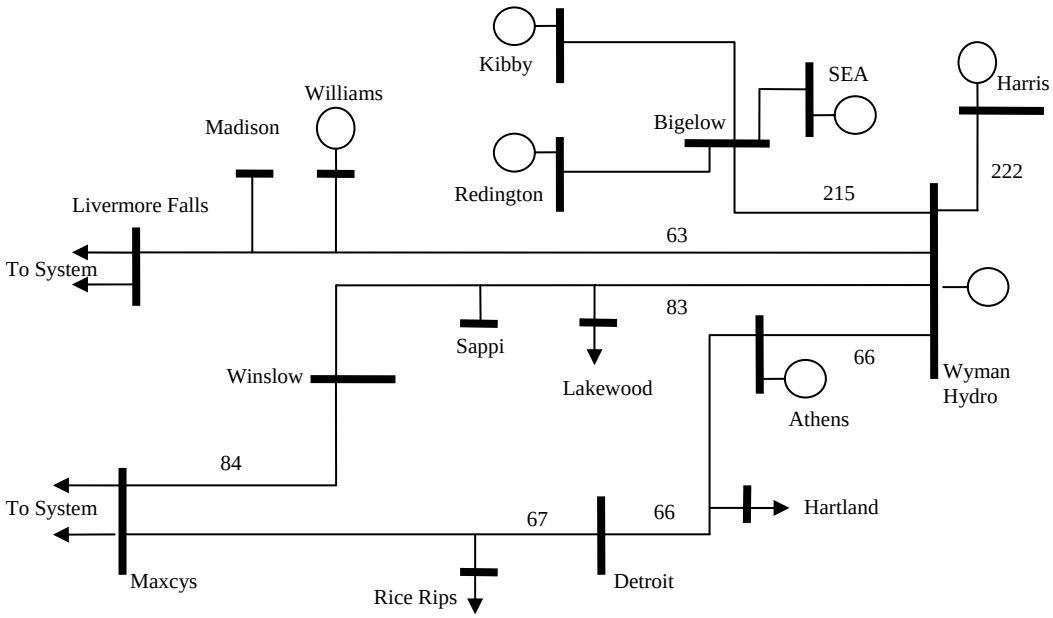


Figure 1-1 - Simplified 115kV One-line Diagram of Kibby Mountain Interconnection Request

2 STEADY-STATE METHODOLOGY AND ASSUMPTIONS

This study has evaluated the impact of adding the Project on the reliability and operating characteristics of the interconnected bulk power system. The study accounts for other projects or relevant facility upgrades that have been approved as of the expected in service date of December 2008. This interconnection feasibility study will provide the steady-state and short-circuit analysis performed in accordance with ISO New England transmission planning procedures.

2.1 SYSTEM RELIABILITY PERFORMANCE CRITERIA

Performance criteria were applied to system models to determine the acceptability of normal and contingency conditions. Simulation results that fell outside of the criteria were addressed to ensure that overall system reliability was maintained.

2.1.1 Steady-State Voltage Limits

Transmission voltage levels must be maintained within a prescribed bandwidth to ensure proper operation of electrical equipment at both the transmission and customer voltage ranges. Equipment damage and widespread power outages are more likely to occur when transmission-level voltages are not maintained within pre-defined limits. Table 2-1 contains the voltage performance criteria used in this analysis.

Voltage Level	Bus Voltage Limits (% of Nominal)	
	Normal Conditions	Emergency Conditions
> 115 kV	95 to 105%	95 to 105%

Table 2-1, Steady State Voltage Performance Criteria

2.1.2 Steady-State Thermal Limits

New England electric utilities follow a planning philosophy whereby normal thermal ratings shall not be violated under all-lines-in conditions, and the applicable emergency rating shall not be violated under contingency conditions. Table 2-2 contains the thermal loading performance criteria applied to transmission lines and transformers in this feasibility study. The use of long-time emergency (LTE) thermal ratings for importing areas in planning studies recognizes the limited line switching, re-dispatch and system re-configuration options available to operators. The use of short-time emergency (STE) thermal ratings for exporting areas recognizes operator's ability to re-dispatch generation assets in an expeditious manner during system emergencies. These ratings provide adequate flexibility to system operations to address unique circumstances encountered on a day-to-day basis.

System Condition	Time Interval	Maximum Allowable Facility Loading
Pre-Contingency (all-lines-in)	Continuous	Normal Rating
Post-Contingency (Importing Area)	Immediately Following Contingency	Long Time Emergency (LTE) Rating
Post-Contingency (Exporting Area)	Immediately Following Contingency	Short Time Emergency (STE) Rating
	15 Minutes Following Contingency	Long Time Emergency (LTE) Rating

Table 2-2, Steady-State Thermal Loading Performance Criteria

2.1.3 Steady State Powerflow Solution Parameters

The steady state analysis was performed with pre-contingency solution parameters that allowed adjustment of load tap-changing transformers (LTCs), static var compensators (SVCs), switched shunt devices and phase angle regulators (PARs). Post-contingency solution parameters did not allow adjustment of PARs, with all other automatic regulating devices enabled.

3 STEADY-STATE POWERFLOW ANALYSIS

3.1 POWERFLOW BASE CASE DEVELOPMENT

3.1.1 Base Case Origin, Year and Load Levels

The steady state analysis was performed on a set of NPCC library base cases representing a 2011 transmission system. Based on the ISO New England Capacity, Energy, Load and Transmission (CELT) Report, issued in April 2005, a 2008 summer peak load of 29,495 MW was assumed for the New England control area. Based on the ISO New England Capacity, Energy, Load and Transmission (CELT) Report, issued in April 2006, a 2008 summer light load of 13,398 MW (45% of peak) was assumed for the New England control area. These load levels represent a 10% probability of exceeding the forecasted peak demand.

3.1.2 Base Case Naming Conventions

Base case designations are formatted as shown in Figure 3-1 below:

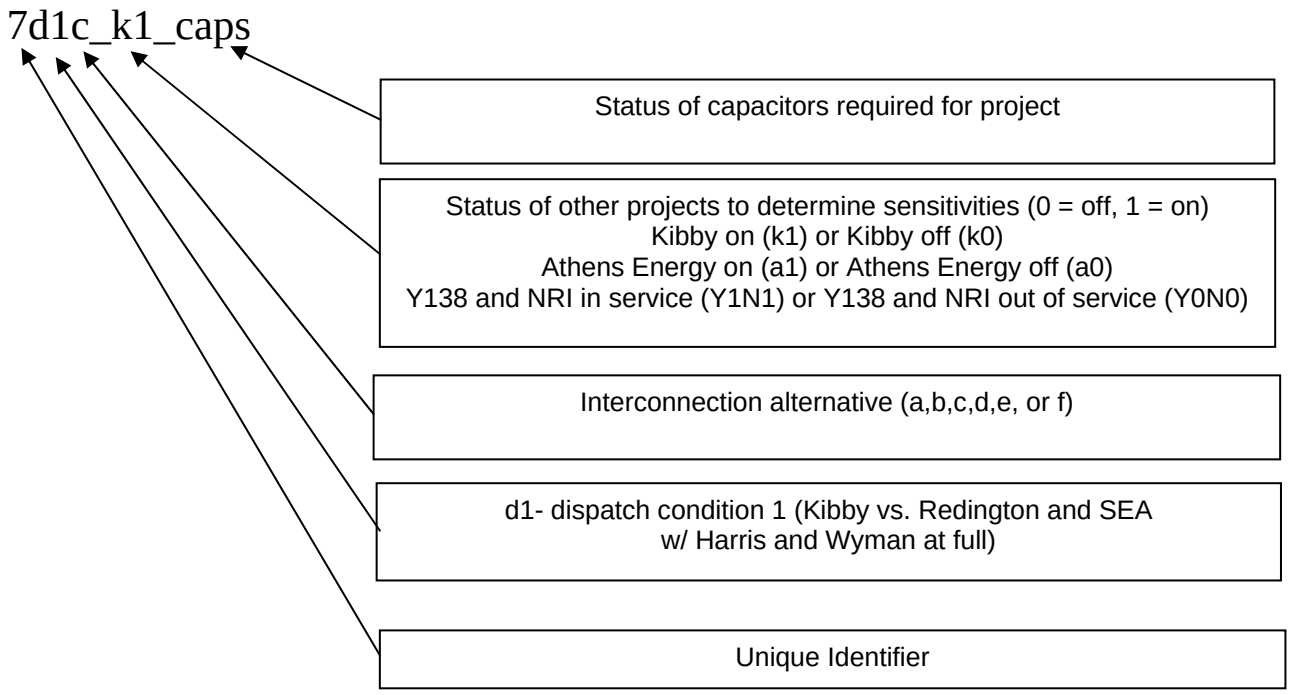


Figure 3-1 - Base Case Naming Convention

3.1.3 Base Case Modifications

The loadflow cases were created from the light and peak load cases available from the 2005 ISO-New England Study Group Library. These library cases needed little modification, as most of the

changes related to the study area were already in the cases. They were modified to reflect several relevant system upgrades including:

3.1.4 2008 Base Model

1. Redington – Phase 2 of the Redington wind farm was added to the model (increase in MW output from 30 to 90 MW, with the addition of several capacitors).
2. Genpower Athens Energy – 42 MW (gross) generator, currently ahead of Kibby Wind Power Project in the ISO New England queue.
3. Y138 and NRI projects – These transmission projects which impact the Maine transmission system were evaluated as a sensitivity.

3.1.5 Base Case Generation Dispatches

- Dispatch condition 1- The Project was dispatched against the Stratton Energy Associates Biomass facility and the Redington Mountain Wind Farm. Figure 3-2 contains a summary of the transmission interfaces and critical generation levels for this dispatch configuration.
- Light load sensitivity cases- The Project was analyzed under light load level conditions for the generation dispatch pattern described above. Figure 3-3 contains a summary of the transmission interfaces and critical generation levels for the light load cases for each dispatch configuration

GENERATOR	2008 SUMMER PEAK CASES Phase 1			
	Baseline	Kibby on	NRI/Y138 In	Athens off
New England	29495	29495	29495	29495
New Brunswick-New England	699	699	999	699
Orrington-South	992	992	1201	992
Surowiec-South	863	862	1029	829
SUROWIEC-SOUTH_Y138	863	862	1059	829
Maine-New Hampshire	991	990	1154	957
ME-NH_Y138	991	990	1184	957
Northern NE-Scobie + 394	2196	2195	2348	2166
Seabrook-South	1403	1402	1448	1396
Sandy Pond-South	1840	1839	1911	1829
North-South	1966	1963	2160	1934
Boston Import	2319	2318	2556	2314
SEMA Export	-482	-483	-490	-483
SEMA/RI Export	245	244	199	241
New England East-West	78	76	-26	46
New York-New England	-594	-594	-494	-565
MIS	494	494	395	494
BELLC	0	0	0	0
No. Hydro (Harris, Wyman, Will	178	178	178	178
Nugs (SEA, GenPower, AEI)	119	78	78	36
AEC #1-3	149	149	149	149
RPA #1-2	272	272	272	272
Redington	90	0	0	0
WEC #1-3	529	529	529	529
Kibby	0	130	130	130
Yarmouth #1-3	225	225	225	225
Yarmouth #4	0	0	0	0
MorComf Hydro	346	346	346	346
ConEd #1-3	510	510	510	510
Newington	0	0	0	0
Seabrook	1318	1318	1318	1318
AES #1-3	840	840	840	840
Merrimack #1-2	433	433	433	433
Vermont Yankee	550	550	550	550
North Western Maine Export	623	622	623	586
Highgate	192	192	192	192
Phase II (Sandy Pd)	1500	1500	1500	1500
Wyman Hydro Export	270	270	270	269

Figure 3-2 - Dispatch 1 Interface and Dispatch Summary

	GENERATOR	SUMMER LIGHT LOAD CASES NRI and Y138 out DISPATCH 1	
		Baseline	Project
SYSTEM LOAD & LOSSES	New England	13398	13398
MAJOR INTERFACES	New Brunswick-New England	695	695
	Orrington-South	1151	1151
	Surowiec-South	1141	1142
	SUROWIEC-SOUTH_Y138	1141	1142
	Maine-New Hampshire	1102	1102
	ME-NH_Y138	1102	1102
	Northern NE-Scobie + 394	1986	1986
	Seabrook-South	1174	1174
	Sandy Pond-South	649	649
	North-South	2088	2088
	Boston Import	1274	1274
	SEMA Export	524	524
	SEMA/RI Export	450	450
	New England East-West	317	317
	New York-New England	182	181
MAINE	MIS	542	542
	BELLC	0	0
	No. Hydro (Harris, Wyman, Wil	178	178
	Nugs (SEA, GenPower, AEI)	116	76
	AEC #1-3	49	49
	RPA #1-2	0	0
	Redington	90	0
	Kibby 1-4	0	130
	WEC #1-3	0	0
	Yarmouth #1-3	177	177
	Yarmouth #4	0	0
NEW HAMPSHIRE	MorComf Hydro	115	115
	ConEd #1-3	0	0
	Newington	0	0
	Seabrook	1318	1318
	AES #1-3	0	0
	Merrimack #1-2	96	96
VERMONT	Vermont Yankee	667	667
	North Western Maine Export	196	196
HVDC TRANSFERS FROM HQ	Highgate	195	195
	Phase II (Sandy Pd)	0	0

Figure 3-3 - Summer Light Load Interface and Dispatch Summary

3.1.6 Fault Contingency Descriptions

Figure 3-4 - Contingency List provides a list of faults used to analyze the impact of the Project on local area and system wide steady state performance. This list can also be found in Appendix C.

345 kV Contingencies (single element)	
Auto Surowiec T1	L/O Surowiec T1
Auto Maxcys T3	L/O Maxcys T3
Auto Mason T9	L/O Mason Auto T9
345L Sect 375	Loss of Sect 375: Maine Yankee x Buxton
345L Sect 377	Loss of Sect 377: Maine Yankee x Surowiec
345L Sect 374	Loss of Sect 374: Surowiec x Buxton
345L Sect 385	Loss of Sect 385: Buxton x Deerfield
345L Sect 391	Loss of Sect 391: Buxton x Scobie

345 kV Contingencies (multiple element)	
345B Sur Any	374, 377
345B Scob 9126	391, 326
345B Deerf 785	385, 307
345B Deerf 851	385,Deerfield T1
345B Deerf 72	307, 373
Surowiec T1 + caps	L/O Suro T1 caps
Maxcys T3 + caps	L/O Max T3 caps
Mason T9 + caps	L/O Mas T9 caps
Max SB KT3L-1	Maxcys T3 SB KT3L-1
Max SB KT3L-2	Maxcys T3 SB KT3L-2
Mason SB KT9L-1	L/O Mason Auto T1 SB KT9L-1
Mason SB KT9L-2	L/O Mason Auto T1 SB KT9L-2

115 kV Contingencies (single element)	
Line Sect 87	Line Sect 87
Line Sect 61-61A	Hotel Road
Line Sect 62	Line Sect 62: Crowleys to Surowiec
Line Sect 63	Line Sect 63:Wyman to Livermore Falls
Line Sect 64	Line Sect 64: Gulf Island to Surowiec
Line Sect 65	Line Sect 65: Orrington to Bucksport
Line Sect 66	Line Sect 66: Wyman to Detroit
Line Sect 67-67A	Line Sect 67: Maxcys to Deptroit
Line Sect 69	Line Sect 69: Topsham to Suroweic
Line Sect 75	Line Sect 75: Hotel Rd to Lewiston
Line Sect 81	Line Sect 81:Surowiec to Mason
Line Sect 83	Line Sect 83: Winslow to Wyman
Line Sect 84	Line Sect 84: Winslow to Maxcys
Line Sect 89	Line Sect 89
Line Sect 166	Line Sect 166
Line Sect 167	Moshers/S167A-PridesCnr
Line Sect 200	Line Sect 200:

115 kV Contingencies (single element) continued	
Line Sect 201	Line Sect 201
Line Sect 202	Line Sect 202
Line Sect 203	Line Sect 203
Line Sect 208	Line Sect 208
Line Sect 208&209	Line Sect 208 & 209 Raymond to Surowiec
Line Sect 209	Line Sect 209
Line Sect 210	Line Sect 210
Line Sect 210&211	Line Sect 210 & 211
Line Sect 211	Line Sect 211
Line Sect 212	Line Sect 212
Line Sect 217	Line Sect 217
Line Sect 228	Line Sect 228
Line Sect 229	Line Sect 229

115 kV Contingencies (multiple element)	
Sect 200 SB K200-4	Sect 200 SB K200-4
Sect 63 SB K63-2	Sect 63 SB K63-2
Sect 89 SB K89-1	Sect 89 SB K89-1 or bus fault
Sect 200 SB K200-1	Sect 200 SB K200-1
Gulf Island any SB not K200-1	Gulf Island any SB not K200-1
Bucksport SB KBS1/2	Bucksport Bus SB KBS1/2
Detroit Bus SB K85-1 or K203-1	Detroit Bus SB K85-1 or K203-1
Sect 67 SB K67-1	Sect 67SB K67-1
Sect 66 SB K66-6	Line Sect 66 SB K66-6
Sect 83 SB K83-1	Sect 83 SB K83-1
Sect 84 SB K84-1	Sect 84 SB K84-1

115 kV Contingencies (specific to Alternative D)	
Wym2Livermore	Wyman to Livermore Falls
LvFlsSB200_63	Livermore Falls SB 200 and 63
LvFlsSB63_200	Livermore Falls SB 63 and 200
LvFlsSB200_new	Livermore Falls SB 200 and NEW
LvFlsSB89_new	Livermore Falls SB 89 and NEW
LvFlsSB63_89	Livermore Falls SB 63 and 89 term
LvFlsSB89_63	Livermore Falls SB 89 and 63 term

115 kV Contingencies (specific to Alternative E)	
SEA 2 Rum	Stratton to Rumford
215A	Stratton to Bigelow
215	Wyman to Bigelow

Figure 3-4 - Contingency List

3.2 REVIEWING STEADY-STATE ANALYSIS VIOLATION REPORTS

Steady state contingency analysis results for voltage violations are included in Appendix D and thermal overloads are included in Appendix E. The results are organized two ways. The first report displays results sorted and grouped by contingency and the second report displays results grouped by violation. Entries in the reports can be interpreted as follows:

Interpretation of entries in the voltage reports:

- Results are shown for buses with base voltages equal to or greater than 115-kV
- For each bus entry, at least one of the comparison cases represents a violation of criteria
- Post-contingency entries represent a deviation of at least 0.005 pu from the base case voltage
- Voltages that are between 0.92 pu and 0.95 are green
- Voltages that are below 0.92 pu are blue
- Voltages that are above 1.05 pu are red

Interpretation of entries in the thermal reports:

- Results are shown for transmission lines between busses with base voltages equal to or greater than 115-kV.
- For each branch entry, at least one of the comparison cases represents a loading greater than 95%
- Post-contingency entries represent a deviation of at least 0.5% from the base loading
- Loadings that are greater than 100 % of the Short Time Emergency limit are red

4 2008 PEAK LOAD STEADY STATE ANALYSIS RESULTS

Dispatch condition 1 of the Study consisted of dispatching the Project online against Redington and Stratton Energy Associates concurrent with heavy Harris and Wyman Hydro generation levels. Phase 1 analysis was performed using existing Section 215 to transfer power to the Wyman Hydro bus.

4.1 BASELINE SYSTEM WITHOUT KIBBY WINDFARM

4.1.1 Voltage Performance

Baseline System - All Lines In
Under normal conditions, Steady state voltage analysis reported no violations of reliability criteria for the baseline configuration and all lines in-service in any of the base cases.

Baseline System – Post-Contingency
The following discussion addresses the low voltage criteria violation in the primary area of concern in the base system under contingency conditions. Complete contingency analysis results for this configuration can be reviewed in Appendix D1.

115 kV KT3L-1 Stuck Breaker Contingency at Maxcys
The KT3L-1 Stuck Breaker contingency removes the Maxcys T3 transformer from service, in addition to the Maxcys 115 kV Bus #1. The isolation of the Maxcys 115 kV Bus #1 open ends Section 60 (Maxcys-Bowman Street), Section 80 (Maxcys-Highland), Section 67 (Maxcys-Detroit), and also removes the two 50 MVAr capacitor banks. This contingency leaves Rice Rips feeding radial out of Detroit via Section 67/67A, leaving Rice Rips voltage at 0.950 (right at the 0.950 criteria).

4.1.2 Thermal Performance

Baseline System - All Lines In
Under normal conditions, steady state thermal analysis reported no violations of reliability criteria for the baseline configuration and all lines in-service in any of the base cases.

Baseline System – Post-Contingency
The following discussion addresses various circuit elements in the study area that demonstrated the most significant violations of thermal criteria in the base systems under contingency conditions. Complete contingency analysis results for this configuration can be reviewed in Appendix E1.

115 kV Wyman Hydro to Winslow - Section 83
In the dispatch 1 cases, Section 83 experiences loadings from 101% to 120.8% of the summer STE rating of 142.8 MVA for any contingency (including stuck breakers and bus faults) that involves the loss of either Section 66 or Section 63. The contingencies and magnitude of the thermal overloads are described below in Table 4-1. Section 83 line rating is currently sag

limited and has a 172.8 MVA limit at its maximum conductor operating temperature. This is 121% of the existing 142.8 MVA STE rating.

115 kV Wyman Hydro to Detroit - Section 66
In the dispatch 1 case with heavy Wyman Hydro area generation, Section 66 flow exceeds the summer STE rating of 171.8 MVA by 0.5% for loss of Section 83.

	Contingency					
Overloaded Line Section (% of Short-time Emergency Rating)	**Section 63**	**Section 66**	**Section 83**	**Detroit Bus fault or Detroit K85-1 or K203-1 SB**	**Detroit K67-1 SB**	**Detroit K66-6 SB**
Section 83 (% Summer STE of 142.8 MVA)	109.3	110.4		120.8	120.2	110.5
Section 66 (% Summer STE of 171.8 MVA)			100.5			

Table 4-1, Pre-existing Thermal Overloads Under Dispatch 1

4.2 POST-PROJECT WITH KIBBY WINDFARM

4.2.1 Voltage Performance

Post-Project System - All Lines In
Under normal conditions, steady state voltage analysis reported no violations of reliability criteria for the baseline configuration and all lines in-service in any of the base cases.

Post-Project System – Post-Contingency
The following discussion addresses the low voltage criteria violations in the primary area of concern in the base system under contingency conditions. Complete contingency analysis results for this configuration can be reviewed in Appendix D1.

115 kV KT3L-1 Stuck Breaker Contingency at Maxcys
The KT3L-1 Stuck Breaker contingency removes the Maxcys T3 transformer from service, in addition to the Maxcys 115 kV Bus #1. The isolation of the Maxcys 115 kV Bus #1 open ends Section 60 (Maxcys-Bowman Street), Section 80 (Maxcys-Highland), Section 67 (Maxcys-Detroit), and also removes the two 50 MVAr capacitor banks. This contingency leaves Rice Rips feeding radial out of Detroit via Section 67/67A, leaving Rice Rips voltage at 0.947 (slightly below the 0.95 criteria).

4.2.2 Thermal Performance

Post-Project System - All Lines In

Under normal conditions, steady state thermal analysis reported no violations of reliability criteria for the baseline configuration and all lines in-service in any of the base cases.

Post-Project System – Post-Contingency

The following discussion addresses various circuit elements in the study area that demonstrated the violations of thermal criteria in the base systems under contingency conditions. Complete contingency analysis results for this configuration can be reviewed in Appendix E1.

115 kV Wyman Hydro to Winslow - Section 83

In the dispatch 1 case, Section 83 experiences loadings from 101% to 121.8% of the summer STE rating of 142.8 MVA for any contingency (including stuck breakers and bus faults) that involved the loss of either Section 66 or Section 63. This overload is pre-existing and is not made significantly worse (greater than 1%) by the Project. Generation could be re-dispatched or Section 83 could be re-rated to mitigate this overload.

115 kV Wyman Hydro to Detroit - Section 66

In the dispatch 1 case, Section 66 flow exceeds the summer STE rating of 171.8 MVA by 1.1% for loss of the Section 83. This overload represents an increase of 0.6% from the baseline case and is not made significantly worse by the Project. Generation could be re-dispatched or Section 66 could be re-rated to mitigate this overload.

4.2.3 GenPower Athens Energy Offline Sensitivity Analysis

A sensitivity analysis was performed to examine the effect of the Project with the Athens Energy Project offline. Since Athens is ahead of the Project in the queue it was assumed to be online in the original Dispatch 1.

Voltage Performance- Post-Contingency

The following discussion addresses the low voltage criteria violations in the primary area of concern in the post-Project system under contingency conditions. Complete contingency analysis results for this configuration can be reviewed in Appendix D2.

115 kV KT3L-1 Stuck Breaker Contingency at Maxcys

The KT3L-1 Stuck Breaker contingency removes the Maxcys T3 transformer from service, in addition to the Maxcys 115 kV Bus #1. The isolation of the Maxcys 115 kV Bus #1 open ends Section 60 (Maxcys-Bowman Street), Section 80 (Maxcys-Highland), Section 67 (Maxcys-Detroit), and also removes the two 50 MVAr capacitor banks. This contingency leaves Rice Rips feeding radial out of Detroit via Section 67/67A. Table 4-2, below summarizes the voltages for selected busses most impacted by the Project. This table also provides a comparison of the voltage violation mitigation options discussed below.

Substation	Baseline	Kibby on	Kibby on w/ 14 MVAr capacitors spread out on CMP's 34.5 kV system	Kibby on w/ 30 MVAr capacitor @ Kibby 115	Kibby on w/ 25 MVAr capacitor @ Wyman Hydro
Rice Rips	0.930	0.919	0.951	0.926	0.932
Lakewood	0.960	0.945	0.951	0.955	0.963
Sappi Somerset	0.955	0.942	0.948	0.951	0.959

Table 4-2, Post Contingency Voltages for KT3L-1 Stuck Breaker with Athens Offline

115 kV Wyman Hydro to Winslow - Section 83 Contingency

The contingent loss of Section 83 removes one of the three transmission paths available to export the power from the Wyman Hydro bus. This results in depressed voltages due to the increased loading on Section 66 and Section 63. The Hartland and Gorbell(Athens) buses were at 0.945 and 0.944 respectively. Voltage violation mitigation options are discussed below.

115 kV K89-1 Stuck Breaker Contingency at Livermore Falls

The K89-1 Stuck Breaker contingency clears the Livermore Falls bus, leaving Section 63 open-ended. Since Section 63 is one of the three lines that export power from the Wyman Hydro bus, this results in increased loading on Section 83 and Section 66. This flow increase results in depressed area voltages, with Sturtevant and Madison Paper showing up as violations at 0.940 and 0.948 respectively. Voltage violation mitigation options are discussed below.

Voltage Violation Mitigation Options

Three approaches were taken in an attempt to restore the low voltages caused by the KT3L-1 SB contingency, the K89-1 SB contingency, or the Section 83 contingency to pre-project values or 0.95.

- The first approach is to place capacitors at or near the buses where the voltage violation is occurring. This ends up requiring 14 MVAr of capacitors at three stations on CMP's 34.5 kV sub-transmission system. A new 8 MVAr capacitor would be placed at the Rice Rips substation for the KT3L-1 SB contingency. The Sturtevant station would require an additional 3 MVAr for the K89-1 SB contingency. The Detroit station would require an additional 3 MVAr for the Section 83 contingency. Since Detroit and Sturtevant already have capacitors, further analysis would be required to determine the most effective way to add capacitance.

- The second approach would be to add capacitors directly at the Kibby 115 kV station to offset the reactive demand that the Project places upon the system. Several capacitor sizes were evaluated as part of this analysis. A 35 MVAr capacitor appeared too large, as it causes high pre-contingency voltages. A 30 MVAr capacitor was also analyzed. Although the 30 MVAr capacitor does not result in high voltages, it also doesn't appear to fully restore the low voltages at Rice Rips to the pre-Project value.

- The third approach would be to place a 25 MVAr capacitor at the Wyman Hydro bus. This approach appears to provide the optimal solution to mitigating the low voltages. One advantage of locating a capacitor at Wyman Hydro is its centralized location to the Section 63, Section 83, and Section 66 corridors, allowing it to provide support for several different contingencies.

Thermal Performance - Post-Contingency

Contingency analysis results for the Athens offline configuration showed that there are several violations of thermal criteria in the primary area of concern following specific contingencies that are caused by the Project. With Athens Energy offline, there isn't as much generation within the Wyman Hydro Export area, resulting in less severe thermal overloading. Section 83 still experiences line loading above the current summer STE limit of 142.8 MVA and would still need to be re-rated in order to mitigate these overloads. The Section 66 overloads are much less severe and would not require line re-rating, as is required in the Athens online cases. The contingencies and magnitude of the thermal overloads are described below in Table 4-3, Section 83 Post Project Thermal Overloads with Athens Offline. Complete contingency analysis results for this configuration can be reviewed in Appendix E2.

	Contingency				
Overloaded Line Section (% of Short-time Emergency Rating)	**Section 63**	**Section 66**	**Detroit Bus fault or Detroit K85-1 or K203-1 SB**	**Detroit K67-1 SB**	**Detroit K66-6 SB**
Section 83 (% Summer STE of 142.8 MVA)	104	111.6	110.4	110	111.7

Table 4-3, Section 83 Post Project Thermal Overloads with Athens Offline

4.2.4 NRI and Y138 Closing Sensitivity Analysis

A sensitivity analysis was performed to examine the effect on the Project with the NRI and Y138 Closing Projects in service. The NRI and Y138 in service cases were modeled with the New Brunswick to New England transfer at 1000 MW and the Orrington-South interface at 1200 MW. The Y138 Closing Project was modeled with 110 MW flowing out of Kimball Road toward New Hampshire. The NRI and Y138 Closing Projects also include 90 MVAr of capacitors that were placed in service for this analysis (60 MVAr at Kimball Road and 30 MVAr at Gulf Island). Complete contingency analysis results for this configuration can be reviewed in Appendix D3 and E3 for voltage and thermal, respectively.

The NRI and Y138 sensitivity analysis showed that the capacitors at Kimball Road and Gulf Island help support the voltage in that area of the transmission system. The Kimball Road and Gulf Island capacitors improve the voltage profile such that the capacitors recommended in the phase 1 Voltage Performance analysis could be eliminated from this project.

As the Y138 Closing Project isn't in service, an operating guide has yet to be developed to reference when performing studies. As part of the I.3.9 approval for this Project, further sensitivity analysis should be performed on a wider range of Y138 flow to New Hampshire to ensure reliability over the full range of possible Y138 closed scenarios.

4.2.5 2008 Peak Load Steady State Analysis Summary

Due to the fact that the Project was dispatched against nearby Redington and SEA generation, transmission upgrades to mitigate thermal overloads were not required. This analysis has shown that there are pre-existing thermal overload issues on Section 83 that may require re-dispatch of generation to maintain reliable operation. Section 83 could optionally be re-rated to restore reliability.

The Project was shown to have adverse impact upon voltages in the primary area of concern under certain system configurations, particularly when Athens Energy is dispatched offline. With Athens Energy online, there was only one contingency (Maxcys KT3L-1 stuck breaker) that resulted in a marginal voltage violation at Rice Rips of 0.947. The NRI and Y138 Closing sensitivity analysis showed no voltage violations. With Athens Energy offline, there are several contingencies that each cause voltage violations in electrically distant areas. The Maxcys KT3L-1 stuck breaker contingency results in voltage violations at Rice Rips, Lakewood, and Sappi; the Section 83 contingency results in voltage violations at Gorbell and Hartland; and the K89-1 stuck breaker contingency results in voltage violations at Sturtevant. These voltage violations can be mitigated by adding a 25 MVAr capacitor at the Wyman Hydro bus or by adding 14 MVAr of smaller capacitors to three of CMP's 34.5 kV stations at/near the sites experiencing the low voltages.

5 2008 LIGHT LOAD STEADY STATE ANALYSIS

Additional analysis was performed to examine the effect that system load level has on the Project. The generation dispatch that was specified by the developer for peak load analysis was duplicated for the light load analysis.

Light Load Summary

This analysis dispatched the Project against Redington and SEA. No voltage violations were identified that weren't already identified in the peak load analysis. These voltage violations were mitigated by adding a capacitor at Wyman Hydro. No new thermal violations were introduced in the light load analysis. The results of this analysis can be reviewed in Appendix D4 and E4.

6 COST ESTIMATES

Budgetary cost estimates have been developed and are presented below. The cost estimates presented below reflect typical cost experience for the design, procurement and construction of comparable transmission line and substation facilities. These costs do not reflect land acquisition or regulatory permitting costs. These costs are included as budgetary level cost estimates in 2006 dollars and are not considered to be a detailed engineering cost estimate for construction.

This analysis showed that capacitor additions are required in order to mitigate adverse impact caused by the Project. Two acceptable options were accessed as presented in Table 6-1 below.

Kibby Mountain Wind Farm – Cost Estimates	
System Improvement	Estimate ($ million)
Option 1- 14 MVAr capacitors on CMP's 34.5-kV system	
8 MVAr capacitor at Rice Rips substation	0.6
3 MVAr capacitor at Detroit substation	0.3
3 MVAr capacitor at Sturtevant substation	0.3
Option 1 total	**1.2**
Option 2 – 25 MVAr capacitor at Wyman Hydro substation	**1.2**

Table 6-1, Phase 1 Cost Estimate

7 SHORT CIRCUIT ANALYSIS

Short-circuit studies were conducted to assess the impact of the Project on fault current levels and breaker duty in the area. E/PRO assessed the device interrupting ratings, as provided by Central Maine Power Company (CMP) to determine if the transmission system changes create an over-duty condition. The results of this analysis showed that there are no over-duty conditions. The results of these calculations are shown in Appendix G.

8 CONCLUSIONS

This study evaluated the impact that the Kibby Mountain Wind Farm has on the reliability and operability of the interconnected bulk power transmission system. Steady state thermal and voltage analysis examined two New England load levels: 2008 summer peak (29,495 MW) and 2008 summer light load (13,398 MW). Sensitivity analysis was also performed for other projects in the ISO New England queue, including GenPower Athens Energy, the Northeast Reliability Interconnect, and the Y138 Closing Project. Testing compared area transmission reliability performance for the baseline system and the system with the Kibby Mountain Wind Farm project.

The peak load steady state anlaysis investigation evaluated the Project dispatched against nearby Redington and SEA generation. Since Redington and SEA are nearby units, it was expected that transmission upgrades to mitigate thermal overloads would not be required. The analysis shows that although there are pre-existing thermal overload issues on Section 83, there are no adverse impacts introduced by this phase of the project; from a thermal standpoint. The Project was shown to have adverse impact upon voltages in the primary area of concern under certain system configurations, particularly when Athens Energy is dispatched offline. With Athens Energy offline, there are several contingencies that each cause voltage violations in electrically distant areas. These voltage violations can be mitigated by adding a 25 MVAr capacitor at the Wyman Hydro bus or by adding 14 MVAr of smaller capacitors to three of CMP's 34.5 kV stations at/near the sites experiencing the low voltages.

The Kibby Mountain Wind Farm Project demonstrated acceptable system performance for the conditions and assumptions included in this analysis. The Project, along with the recommended upgrades showed no significant adverse impact on the reliability or operability of the NEPOOL transmission system.

APPENDIX A – Interface and Dispatch Summaries

Included in Appendix A:

2008 Summer Peak Load – Dispatch 1:
Appendix A-1: Athens on – NRI/Y138 out – Baseline
Appendix A-2: Athens on – NRI/Y138 out – Project in service

Appendix A-3: Athens off – NRI/Y138 out – Baseline
Appendix A-4: Athens off – NRI/Y138 out – Project in service

Appendix A-5: Athens on – NRI/Y138 in – Baseline
Appendix A-6: Athens on – NRI/Y138 in – Project in service

2008 Summer Light Load – Dispatch 1:
Appendix A-7: Athens on – NRI/Y138 out – Baseline
Appendix A-8: Athens on – NRI/Y138 out – Project in service

Case name: 7ad1 k0
2005 NPCC LIBRARY-2011 SUMMER PEAK
CASE LOAD @ 2008 SUMMER PEAK 90/10 29495 MW

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	699	-9
Orrington-South	992	50
Surowiec-South	863	-154
SUROWIEC-SOUTH Y138	863	-154
Maine-New Hampshire	991	-120
ME-NH Y138	991	-120
Northern NE-Scobie + 394	2196	97
Seabrook-South	1403	146
North-South	1966	-223
New York-New England	-594	-180

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 618 MW																				
70060	MIS GT1	1	179	110	162	85	70061	MIS GT2	2	179	110	162	85	70062	MIS ST	3	191	118	170	96
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	2	8	2
70019	ELLSWORT	1	0	2	8	2	70040	GRAHAM 1	1	0	2	12	2	70066	PERC 138	1	0	4	20	4
70029	POWERSVI	1	0	2	45	2	70067	UP5 125	1	0	3	19	3	70070	UP6 125	1	0	3	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	2	7	2							
CMP WESTERN GEN TOTAL: 707 MW																				
70377	AEC G1	1	55	41	50	29	70378	AEC G2	2	55	41	50	29	70379	AEC G3	3	55	41	50	29
70381	RPA CG1	1	179	120	179	67	70382	RPA SG2	2	93	70	93	34	70101	RUMFRDGN	1	7	1	6	0
70370	AEI GEN	1	39	3	36	3	70177	LWSTN GN	1	17	0	2	0	70425	MEADCOGN	1	110	15	93	15
70104	LEW LWR	1	30	3	27	3	70118	GULF ISL	1	34	0	21	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	9	70421	J/MILL B	1	35	19	23	0
70420	J/MILL A	1	35	19	21	2	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 545 MW																				
70356	HARRIS#1	1	17	7	17	2	70357	HARRIS#2	2	37	15	36	4	70358	HARRIS#3	3	36	15	35	4
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	2	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	41	18
70391	REDCOLLW	1	45	9	45	3	70392	BNCOLLLW	1	45	9	45	3	70351	KIBBY G1	1	31	15	0	0
70352	KIBBY G2	2	31	15	0	0	70353	KIBBY G3	3	36	15	0	0	70354	KIBBY G4	4	31	15	0	0
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	7	4
70157	GUILF GN	1	15	0	24	0	70330	WINSLOW	2	8	0	7	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	42	26	70422	WARRN G1	1	51	15	51	15
70423	WARRN G2	1	62	11	45	11	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	32	65	32
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 16 MW																				
70222	TOPSHAM	1	20	3	3	2	70223	TOPSHMGN	1	14	0	7	0	70223	TOPSHMGN	2	14	0	6	0
CMP PORT/SOUTH GEN TOTAL: 864 MW																				
70127	SPRNG GN	1	11	0	11	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	172	79	70387	WBK G2	2	185	109	172	79	70388	WBK G3	3	196	94	185	94
70365	WF WY #1	1	57	14	50	14	70366	WF WY #2	2	57	14	50	14	70367	WF WY #3	3	125	55	125	14
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	10	50	10	70419	SDW#10GN	1	16	4	14	4	70129	LOUDEN	1	37	0	7	0
70160	W.BUXTON	1	37	0	2	0	70162	SANFORD	1	2	1	1	0	70179	MERC GN	1	19	5	18	5
MAJOR NH GEN TOTAL: 3247 MW																				
72869	SBRK G1	1	1318	375	1318	333	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	25
72871	SCHILLER	5	50	25	50	25	72872	SCHILLER	6	48	25	48	25	72866	MERMK G1	1	113	53	113	17
72867	MERMK G2	2	320	150	320	48	71950	GRANRDG1	1	280	140	280	35	71951	GRANRDG2	2	280	140	280	140
72701	AESSTG	3	250	161	280	26	72702	CONEDG1	1	169	105	160	46	72703	CONEDG2	2	169	105	160	46
72704	CONEDG3	3	195	120	190	46														

SVD DATA

SVD Name	MVAR

CHESTER	33
ORRINGTN	134
MAXCYS	100
SUROWIEC	50
S.GORHAM	50
CROWLEYS	50
SANFORD	31

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.027	70001	CHESTER	345	0.998	70002	ORRINGTN	345	1.008	70003	MAXCYS	345	0.998
70086	ME YANK	345	1.009	70087	SUROWIEC	345	1.011	70088	WYMAN	345	1.019	70089	S.GORHAM	345	1.018
70090	BUXTON	345	1.016	70091	MASON	345	1.011	72692	NWGTN345	345	1.035	72697	LAWRENCE	345	1.024
72696	AMHST345	345	1.018	72695	TIMBR345	345	1.035	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.015
72691	DRFLD345	345	1.017	71786	SANDY PD	345	1.037	70027	ORRINGTN	115	1.035	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.007	70120	MAXCYS	115	1.036	70121	MASON	115	1.029	70125	SUROWIEC	115	1.027
70165	S.GORHAM	115	1.033	70130	Q HILL	115	1.011	70162	SANFORD	115	1.014	70185	WBK 115	115	1.043
72746	SCOBIE2	115	1.040	72718	DEERFELD	115	1.041	72754	3 RIVERS	115	1.020	72770	3 RIV 2	115	1.020
72745	SCHILLER	115	1.024	72734	MERRMACK	115	1.035								

Case name: 7ad1 k1
2005 NPCC LIBRARY-2011 SUMMER PEAK
CASE LOAD @ 2008 SUMMER PEAK 90/10 29495 MW

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	699	-8
Orrington-South	992	52
Surowiec-South	862	-157
SUROWIEC-SOUTH Y138	862	-157
Maine-New Hampshire	990	-122
ME-NH Y138	990	-122
Northern NE-Scobie + 394	2195	96
Seabrook-South	1402	147
North-South	1963	-223
New York-New England	-594	-178

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 618 MW																				
70060	MIS GT1	1	179	110	162	86	70061	MIS GT2	2	179	110	162	86	70062	MIS ST	3	191	118	170	97
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	2	8	2
70019	ELLSWORT	1	0	2	8	2	70040	GRAHAM 1	1	0	2	12	2	70066	PERC 138	1	0	4	20	4
70029	POWERSVI	1	0	2	45	2	70067	UP5 125	1	0	3	19	3	70070	UP6 125	1	0	3	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	2	7	2							
CMP WESTERN GEN TOTAL: 707 MW																				
70377	AEC G1	1	55	41	50	30	70378	AEC G2	2	55	41	50	30	70379	AEC G3	3	55	41	50	30
70381	RPA CG1	1	179	120	179	67	70382	RPA SG2	2	93	70	93	35	70101	RUMFRDGN	1	7	1	6	0
70370	AEI GEN	1	39	3	36	3	70177	LWSTN GN	1	17	0	2	0	70425	MEADCOGN	1	110	15	93	15
70104	LEW LWR	1	30	3	27	3	70118	GULF ISL	1	34	0	21	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	9	70421	J/MILL B	1	35	19	23	-0
70420	J/MILL A	1	35	19	21	2	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 544 MW																				
70356	HARRIS#1	1	17	7	17	3	70357	HARRIS#2	2	37	15	36	6	70358	HARRIS#3	3	36	15	35	6
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	2	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	0	0
70391	REDCOLLW	1	45	9	0	0	70392	BNCOLLLW	1	45	9	0	0	70351	KIBBY G1	1	31	15	31	4
70352	KIBBY G2	2	31	15	31	6	70353	KIBBY G3	3	36	15	36	6	70354	KIBBY G4	4	31	15	31	6
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	7	4
70157	GUILF GN	1	15	0	24	0	70330	WINSLOW	2	8	0	7	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	42	28	70422	WARRN G1	1	51	15	51	15
70423	WARRN G2	1	62	11	45	11	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	32	65	32
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 16 MW																				
70222	TOPSHAM	1	20	3	3	2	70223	TOPSHMGN	1	14	0	7	0	70223	TOPSHMGN	2	14	0	6	0
CMP PORT/SOUTH GEN TOTAL: 864 MW																				
70127	SPRNG GN	1	11	0	11	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	172	80	70387	WBK G2	2	185	109	172	80	70388	WBK G3	3	196	94	185	94
70365	WF WY #1	1	57	14	50	14	70366	WF WY #2	2	57	14	50	14	70367	WF WY #3	3	125	55	125	14
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	10	50	10	70419	SDW#10GN	1	16	4	14	4	70129	LOUDEN	1	37	0	7	0
70160	W.BUXTON	1	37	0	2	0	70162	SANFORD	1	2	1	1	0	70179	MERC GN	1	19	5	18	5
MAJOR NH GEN TOTAL: 3247 MW																				
72869	SBRK G1	1	1318	375	1318	334	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	25
72871	SCHILLER	5	50	25	50	25	72872	SCHILLER	6	48	25	48	25	72866	MERMK G1	1	113	53	113	17
72867	MERMK G2	2	320	150	320	48	71950	GRANRDG1	1	280	140	280	35	71951	GRANRDG2	2	280	140	280	140
72701	AESSTG	3	250	161	280	26	72702	CONEDG1	1	169	105	160	46	72703	CONEDG2	2	169	105	160	46
72704	CONEDG3	3	195	120	190	46														

SVD DATA

SVD Name	MVAR

CHESTER	32
ORRINGTN	134
MAXCYS	100
SUROWIEC	50
S.GORHAM	50
CROWLEYS	50
SANFORD	31

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.026	70001	CHESTER	345	0.997	70002	ORRINGTN	345	1.008	70003	MAXCYS	345	0.997
70086	ME YANK	345	1.009	70087	SUROWIEC	345	1.011	70088	WYMAN	345	1.019	70089	S.GORHAM	345	1.018
70090	BUXTON	345	1.016	70091	MASON	345	1.010	72692	NWGTN345	345	1.035	72697	LAWRENCE	345	1.024
72696	AMHST345	345	1.018	72695	TIMBR345	345	1.035	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.015
72691	DRFLD345	345	1.017	71786	SANDY PD	345	1.037	70027	ORRINGTN	115	1.035	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.006	70120	MAXCYS	115	1.034	70121	MASON	115	1.028	70125	SUROWIEC	115	1.027
70165	S.GORHAM	115	1.033	70130	Q HILL	115	1.011	70162	SANFORD	115	1.014	70185	WBK 115	115	1.043
72746	SCOBIE2	115	1.040	72718	DEERFELD	115	1.041	72754	3 RIVERS	115	1.020	72770	3 RIV 2	115	1.020
72745	SCHILLER	115	1.024	72734	MERRMACK	115	1.035								

Case name: 7ad1 a0k0
2005 NPCC LIBRARY-2011 SUMMER PEAK
CASE LOAD @ 2008 SUMMER PEAK 90/10 29495 MW

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	699	-9
Orrington-South	992	43
Surowiec-South	830	-146
SUROWIEC-SOUTH Y138	830	-146
Maine-New Hampshire	959	-114
ME-NH Y138	959	-114
Northern NE-Scobie + 394	2167	95
Seabrook-South	1397	141
North-South	1937	-221
New York-New England	-565	-185

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 618 MW																				
70060	MIS GT1	1	179	110	162	84	70061	MIS GT2	2	179	110	162	84	70062	MIS ST	3	191	118	170	95
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	2	8	2
70019	ELLSWORT	1	0	2	8	2	70040	GRAHAM 1	1	0	2	12	2	70066	PERC 138	1	0	4	20	4
70029	POWERSVI	1	0	2	45	2	70067	UP5 125	1	0	3	19	3	70070	UP6 125	1	0	3	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	2	7	2							
CMP WESTERN GEN TOTAL: 707 MW																				
70377	AEC G1	1	55	41	50	29	70378	AEC G2	2	55	41	50	28	70379	AEC G3	3	55	41	50	29
70381	RPA CG1	1	179	120	179	65	70382	RPA SG2	2	93	70	93	34	70101	RUMFRDGN	1	7	1	6	0
70370	AEI GEN	1	39	3	36	3	70177	LWSTN GN	1	17	0	2	0	70425	MEADCOGN	1	110	15	93	15
70104	LEW LWR	1	30	3	27	3	70118	GULF ISL	1	34	0	21	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	9	70421	J/MILL B	1	35	19	23	0
70420	J/MILL A	1	35	19	21	2	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 503 MW																				
70356	HARRIS#1	1	17	7	17	3	70357	HARRIS#2	2	37	15	36	5	70358	HARRIS#3	3	36	15	35	5
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	2	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	41	21
70391	REDCOLLW	1	45	9	45	3	70392	BNCOLLLW	1	45	9	45	3	70351	KIBBY G1	1	31	15	0	0
70352	KIBBY G2	2	31	15	0	0	70353	KIBBY G3	3	36	15	0	0	70354	KIBBY G4	4	31	15	0	0
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	7	4
70157	GUILF GN	1	15	0	24	0	70330	WINSLOW	2	8	0	7	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	0	0	70422	WARRN G1	1	51	15	51	15
70423	WARRN G2	1	62	11	45	11	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	32	65	32
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 16 MW																				
70222	TOPSHAM	1	20	3	3	1	70223	TOPSHMGN	1	14	0	7	0	70223	TOPSHMGN	2	14	0	6	0
CMP PORT/SOUTH GEN TOTAL: 864 MW																				
70127	SPRNG GN	1	11	0	11	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	172	75	70387	WBK G2	2	185	109	172	75	70388	WBK G3	3	196	94	185	94
70365	WF WY #1	1	57	14	50	14	70366	WF WY #2	2	57	14	50	14	70367	WF WY #3	3	125	55	125	13
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	10	50	10	70419	SDW#10GN	1	16	4	14	4	70129	LOUDEN	1	37	0	7	0
70160	W.BUXTON	1	37	0	2	0	70162	SANFORD	1	2	1	1	0	70179	MERC GN	1	19	5	18	5
MAJOR NH GEN TOTAL: 3247 MW																				
72869	SBRK G1	1	1318	375	1318	327	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	25
72871	SCHILLER	5	50	25	50	25	72872	SCHILLER	6	48	25	48	25	72866	MERMK G1	1	113	53	113	17
72867	MERMK G2	2	320	150	320	47	71950	GRANRDG1	1	280	140	280	35	71951	GRANRDG2	2	280	140	280	140
72701	AESSTG	3	250	161	280	26	72702	CONEDG1	1	169	105	160	44	72703	CONEDG2	2	169	105	160	44
72704	CONEDG3	3	195	120	190	44														

SVD DATA

SVD Name	MVAR

CHESTER	29
ORRINGTN	134
MAXCYS	100
SUROWIEC	50
S.GORHAM	50
CROWLEYS	50
SANFORD	31

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.027	70001	CHESTER	345	0.998	70002	ORRINGTN	345	1.009	70003	MAXCYS	345	1.001
70086	ME YANK	345	1.012	70087	SUROWIEC	345	1.013	70088	WYMAN	345	1.021	70089	S.GORHAM	345	1.020
70090	BUXTON	345	1.018	70091	MASON	345	1.013	72692	NWGTN345	345	1.035	72697	LAWRENCE	345	1.025
72696	AMHST345	345	1.018	72695	TIMBR345	345	1.035	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.016
72691	DRFLD345	345	1.018	71786	SANDY PD	345	1.037	70027	ORRINGTN	115	1.035	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.006	70120	MAXCYS	115	1.035	70121	MASON	115	1.030	70125	SUROWIEC	115	1.029
70165	S.GORHAM	115	1.033	70130	Q HILL	115	1.012	70162	SANFORD	115	1.015	70185	WBK 115	115	1.043
72746	SCOBIE2	115	1.041	72718	DEERFELD	115	1.042	72754	3 RIVERS	115	1.021	72770	3 RIV 2	115	1.021
72745	SCHILLER	115	1.025	72734	MERRMACK	115	1.035								

Case name: 7ad1 a0k1
2005 NPCC LIBRARY-2011 SUMMER PEAK
CASE LOAD @ 2008 SUMMER PEAK 90/10 29495 MW

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	699	-8
Orrington-South	992	48
Surowiec-South	829	-150
SUROWIEC-SOUTH Y138	829	-150
Maine-New Hampshire	957	-116
ME-NH Y138	957	-116
Northern NE-Scobie + 394	2166	94
Seabrook-South	1396	142
North-South	1934	-221
New York-New England	-565	-183

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 618 MW																				
70060	MIS GT1	1	179	110	162	86	70061	MIS GT2	2	179	110	162	86	70062	MIS ST	3	191	118	170	97
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	2	8	2
70019	ELLSWORT	1	0	2	8	2	70040	GRAHAM 1	1	0	2	12	2	70066	PERC 138	1	0	4	20	4
70029	POWERSVI	1	0	2	45	2	70067	UP5 125	1	0	3	19	3	70070	UP6 125	1	0	3	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	2	7	2							
CMP WESTERN GEN TOTAL: 707 MW																				
70377	AEC G1	1	55	41	50	30	70378	AEC G2	2	55	41	50	30	70379	AEC G3	3	55	41	50	30
70381	RPA CG1	1	179	120	179	65	70382	RPA SG2	2	93	70	93	34	70101	RUMFRDGN	1	7	1	6	0
70370	AEI GEN	1	39	3	36	3	70177	LWSTN GN	1	17	0	2	0	70425	MEADCOGN	1	110	15	93	15
70104	LEW LWR	1	30	3	27	3	70118	GULF ISL	1	34	0	21	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	9	70421	J/MILL B	1	35	19	23	0
70420	J/MILL A	1	35	19	21	2	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 502 MW																				
70356	HARRIS#1	1	17	7	17	4	70357	HARRIS#2	2	37	15	36	8	70358	HARRIS#3	3	36	15	35	8
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	2	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	0	0
70391	REDCOLLW	1	45	9	0	0	70392	BNCOLLLW	1	45	9	0	0	70351	KIBBY G1	1	31	15	31	4
70352	KIBBY G2	2	31	15	31	7	70353	KIBBY G3	3	36	15	36	6	70354	KIBBY G4	4	31	15	31	7
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	7	4
70157	GUILF GN	1	15	0	24	0	70330	WINSLOW	2	8	0	7	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	0	0	70422	WARRN G1	1	51	15	51	15
70423	WARRN G2	1	62	11	45	11	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	32	65	32
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 16 MW																				
70222	TOPSHAM	1	20	3	3	1	70223	TOPSHMGN	1	14	0	7	0	70223	TOPSHMGN	2	14	0	6	0
CMP PORT/SOUTH GEN TOTAL: 864 MW																				
70127	SPRNG GN	1	11	0	11	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	172	76	70387	WBK G2	2	185	109	172	76	70388	WBK G3	3	196	94	185	94
70365	WF WY #1	1	57	14	50	14	70366	WF WY #2	2	57	14	50	14	70367	WF WY #3	3	125	55	125	13
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	10	50	10	70419	SDW#10GN	1	16	4	14	4	70129	LOUDEN	1	37	0	7	0
70160	W.BUXTON	1	37	0	2	0	70162	SANFORD	1	2	1	1	0	70179	MERC GN	1	19	5	18	5
MAJOR NH GEN TOTAL: 3247 MW																				
72869	SBRK G1	1	1318	375	1318	328	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	25
72871	SCHILLER	5	50	25	50	25	72872	SCHILLER	6	48	25	48	25	72866	MERMK G1	1	113	53	113	17
72867	MERMK G2	2	320	150	320	47	71950	GRANRDG1	1	280	140	280	35	71951	GRANRDG2	2	280	140	280	140
72701	AESSTG	3	250	161	280	26	72702	CONEDG1	1	169	105	160	45	72703	CONEDG2	2	169	105	160	45
72704	CONEDG3	3	195	120	190	45														

SVD DATA

SVD Name	MVAR

CHESTER	29
ORRINGTN	134
MAXCYS	100
SUROWIEC	50
S.GORHAM	50
CROWLEYS	50
SANFORD	31

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.026	70001	CHESTER	345	0.997	70002	ORRINGTN	345	1.008	70003	MAXCYS	345	0.999
70086	ME YANK	345	1.011	70087	SUROWIEC	345	1.012	70088	WYMAN	345	1.021	70089	S.GORHAM	345	1.019
70090	BUXTON	345	1.017	70091	MASON	345	1.012	72692	NWGTN345	345	1.035	72697	LAWRENCE	345	1.025
72696	AMHST345	345	1.018	72695	TIMBR345	345	1.035	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.016
72691	DRFLD345	345	1.018	71786	SANDY PD	345	1.037	70027	ORRINGTN	115	1.035	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.005	70120	MAXCYS	115	1.036	70121	MASON	115	1.030	70125	SUROWIEC	115	1.028
70165	S.GORHAM	115	1.033	70130	Q HILL	115	1.012	70162	SANFORD	115	1.015	70185	WBK 115	115	1.043
72746	SCOBIE2	115	1.041	72718	DEERFELD	115	1.042	72754	3 RIVERS	115	1.021	72770	3 RIV 2	115	1.021
72745	SCHILLER	115	1.025	72734	MERRMACK	115	1.035								

Case name: 7d1 a1y1k0
2005 NPCC LIBRARY-2011 SUMMER PEAK
CASE LOAD @ 2008 SUMMER PEAK 90/10 29495 MW
Kibby off-Athens on-NRI/Y138 in service

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	999	-50
Orrington-South	1201	-75
Surowiec-South	1029	-82
SUROWIEC-SOUTH Y138	1060	-98
Maine-New Hampshire	1154	-88
ME-NH Y138	1185	-103
Northern NE-Scobie + 394	2349	129
Seabrook-South	1448	160
North-South	2161	-214
New York-New England	-494	-192

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 519 MW																				
70060	MIS GT1	1	179	110	130	30	70061	MIS GT2	2	179	110	130	30	70062	MIS ST	3	191	118	135	33
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	2	8	2
70019	ELLSWORT	1	0	2	8	2	70040	GRAHAM 1	1	0	2	12	2	70066	PERC 138	1	0	4	20	4
70029	POWERSVI	1	0	2	45	2	70067	UP5 125	1	0	3	19	3	70070	UP6 125	1	0	3	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	2	7	2							
CMP WESTERN GEN TOTAL: 707 MW																				
70377	AEC G1	1	55	41	50	25	70378	AEC G2	2	55	41	50	25	70379	AEC G3	3	55	41	50	25
70381	RPA CG1	1	179	120	179	41	70382	RPA SG2	2	93	70	93	21	70101	RUMFRDGN	1	7	1	6	0
70370	AEI GEN	1	39	3	36	3	70177	LWSTN GN	1	17	0	2	0	70425	MEADCOGN	1	110	15	93	15
70104	LEW LWR	1	30	3	27	3	70118	GULF ISL	1	34	0	21	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	9	70421	J/MILL B	1	35	19	23	-0
70420	J/MILL A	1	35	19	21	2	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 545 MW																				
70356	HARRIS#1	1	17	7	17	2	70357	HARRIS#2	2	37	15	36	3	70358	HARRIS#3	3	36	15	35	3
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	2	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	41	16
70391	REDCOLLW	1	45	9	45	3	70392	BNCOLLLW	1	45	9	45	2	70351	KIBBY G1	1	31	15	0	0
70352	KIBBY G2	2	31	15	0	0	70353	KIBBY G3	3	36	15	0	0	70354	KIBBY G4	4	31	15	0	0
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	7	4
70157	GUILF GN	1	15	0	24	0	70330	WINSLOW	2	8	0	7	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	42	24	70422	WARRN G1	1	51	15	51	15
70423	WARRN G2	1	62	11	45	11	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	32	65	32
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 16 MW																				
70222	TOPSHAM	1	20	3	3	2	70223	TOPSHMGN	1	14	0	7	0	70223	TOPSHMGN	2	14	0	6	0
CMP PORT/SOUTH GEN TOTAL: 864 MW																				
70127	SPRNG GN	1	11	0	11	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	172	74	70387	WBK G2	2	185	109	172	74	70388	WBK G3	3	196	94	185	94
70365	WF WY #1	1	57	14	50	14	70366	WF WY #2	2	57	14	50	14	70367	WF WY #3	3	125	55	125	13
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	10	50	10	70419	SDW#10GN	1	16	4	14	4	70129	LOUDEN	1	37	0	7	0
70160	W.BUXTON	1	37	0	2	0	70162	SANFORD	1	2	1	1	0	70179	MERC GN	1	19	5	18	5
MAJOR NH GEN TOTAL: 3247 MW																				
72869	SBRK G1	1	1318	375	1318	351	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	25
72871	SCHILLER	5	50	25	50	25	72872	SCHILLER	6	48	25	48	25	72866	MERMK G1	1	113	53	113	11
72867	MERMK G2	2	320	150	320	32	71950	GRANRDG1	1	280	140	280	36	71951	GRANRDG2	2	280	140	280	140
72701	AESSTG	3	250	161	280	27	72702	CONEDG1	1	169	105	160	45	72703	CONEDG2	2	169	105	160	45
72704	CONEDG3	3	195	120	190	45														

SVD DATA

SVD Name	MVAR

CHESTER	-38
ORRINGTN	134
MAXCYS	100
SUROWIEC	100
S.GORHAM	50
CROWLEYS	50
SANFORD	31

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.042	70001	CHESTER	345	1.025	70002	ORRINGTN	345	1.029	70003	MAXCYS	345	1.007
70086	ME YANK	345	1.016	70087	SUROWIEC	345	1.023	70088	WYMAN	345	1.023	70089	S.GORHAM	345	1.022
70090	BUXTON	345	1.020	70091	MASON	345	1.018	72692	NWGTN345	345	1.035	72697	LAWRENCE	345	1.024
72696	AMHST345	345	1.018	72695	TIMBR345	345	1.034	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.015
72691	DRFLD345	345	1.017	71786	SANDY PD	345	1.037	70027	ORRINGTN	115	1.052	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.024	70120	MAXCYS	115	1.033	70121	MASON	115	1.030	70125	SUROWIEC	115	1.029
70165	S.GORHAM	115	1.034	70130	Q HILL	115	1.011	70162	SANFORD	115	1.014	70185	WBK 115	115	1.043
72746	SCOBIE2	115	1.040	72718	DEERFELD	115	1.041	72754	3 RIVERS	115	1.020	72770	3 RIV 2	115	1.020
72745	SCHILLER	115	1.024	72734	MERRMACK	115	1.035								

Case name: 7d1 a1y1k1
2005 NPCC LIBRARY-2011 SUMMER PEAK
CASE LOAD @ 2008 SUMMER PEAK 90/10 29495 MW
Kibby on-Athens on-NRI/Y138 in service

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	999	-49
Orrington-South	1201	-72
Surowiec-South	1029	-84
SUROWIEC-SOUTH Y138	1059	-99
Maine-New Hampshire	1154	-89
ME-NH Y138	1184	-104
Northern NE-Scobie + 394	2348	128
Seabrook-South	1448	160
North-South	2160	-214
New York-New England	-494	-191

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 519 MW																				
70060	MIS GT1	1	179	110	130	30	70061	MIS GT2	2	179	110	130	30	70062	MIS ST	3	191	118	135	34
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	2	8	2
70019	ELLSWORT	1	0	2	8	2	70040	GRAHAM 1	1	0	2	12	2	70066	PERC 138	1	0	4	20	4
70029	POWERSVI	1	0	2	45	2	70067	UP5 125	1	0	3	19	3	70070	UP6 125	1	0	3	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	2	7	2							
CMP WESTERN GEN TOTAL: 707 MW																				
70377	AEC G1	1	55	41	50	26	70378	AEC G2	2	55	41	50	26	70379	AEC G3	3	55	41	50	26
70381	RPA CG1	1	179	120	179	41	70382	RPA SG2	2	93	70	93	21	70101	RUMFRDGN	1	7	1	6	0
70370	AEI GEN	1	39	3	36	3	70177	LWSTN GN	1	17	0	2	0	70425	MEADCOGN	1	110	15	93	15
70104	LEW LWR	1	30	3	27	3	70118	GULF ISL	1	34	0	21	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	9	70421	J/MILL B	1	35	19	23	-0
70420	J/MILL A	1	35	19	21	2	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 544 MW																				
70356	HARRIS#1	1	17	7	17	3	70357	HARRIS#2	2	37	15	36	5	70358	HARRIS#3	3	36	15	35	5
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	2	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	0	0
70391	REDCOLLW	1	45	9	0	0	70392	BNCOLLLW	1	45	9	0	0	70351	KIBBY G1	1	31	15	31	3
70352	KIBBY G2	2	31	15	31	6	70353	KIBBY G3	3	36	15	36	5	70354	KIBBY G4	4	31	15	31	6
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	7	4
70157	GUILF GN	1	15	0	24	0	70330	WINSLOW	2	8	0	7	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	42	26	70422	WARRN G1	1	51	15	51	15
70423	WARRN G2	1	62	11	45	11	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	32	65	32
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 16 MW																				
70222	TOPSHAM	1	20	3	3	2	70223	TOPSHMGN	1	14	0	7	0	70223	TOPSHMGN	2	14	0	6	0
CMP PORT/SOUTH GEN TOTAL: 864 MW																				
70127	SPRNG GN	1	11	0	11	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	172	75	70387	WBK G2	2	185	109	172	75	70388	WBK G3	3	196	94	185	94
70365	WF WY #1	1	57	14	50	14	70366	WF WY #2	2	57	14	50	14	70367	WF WY #3	3	125	55	125	13
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	10	50	10	70419	SDW#10GN	1	16	4	14	4	70129	LOUDEN	1	37	0	7	0
70160	W.BUXTON	1	37	0	2	0	70162	SANFORD	1	2	1	1	0	70179	MERC GN	1	19	5	18	5
MAJOR NH GEN TOTAL: 3247 MW																				
72869	SBRK G1	1	1318	375	1318	351	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	25
72871	SCHILLER	5	50	25	50	25	72872	SCHILLER	6	48	25	48	25	72866	MERMK G1	1	113	53	113	11
72867	MERMK G2	2	320	150	320	32	71950	GRANRDG1	1	280	140	280	36	71951	GRANRDG2	2	280	140	280	140
72701	AESSTG	3	250	161	280	27	72702	CONEDG1	1	169	105	160	45	72703	CONEDG2	2	169	105	160	45
72704	CONEDG3	3	195	120	190	45														

SVD DATA

SVD Name	MVAR

CHESTER	-37
ORRINGTN	134
MAXCYS	100
SUROWIEC	100
S.GORHAM	50
CROWLEYS	50
SANFORD	31

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.042	70001	CHESTER	345	1.025	70002	ORRINGTN	345	1.029	70003	MAXCYS	345	1.006
70086	ME YANK	345	1.016	70087	SUROWIEC	345	1.023	70088	WYMAN	345	1.023	70089	S.GORHAM	345	1.022
70090	BUXTON	345	1.020	70091	MASON	345	1.017	72692	NWGTN345	345	1.035	72697	LAWRENCE	345	1.024
72696	AMHST345	345	1.018	72695	TIMBR345	345	1.034	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.015
72691	DRFLD345	345	1.017	71786	SANDY PD	345	1.037	70027	ORRINGTN	115	1.051	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.023	70120	MAXCYS	115	1.032	70121	MASON	115	1.029	70125	SUROWIEC	115	1.028
70165	S.GORHAM	115	1.034	70130	Q HILL	115	1.011	70162	SANFORD	115	1.014	70185	WBK 115	115	1.043
72746	SCOBIE2	115	1.040	72718	DEERFELD	115	1.041	72754	3 RIVERS	115	1.019	72770	3 RIV 2	115	1.019
72745	SCHILLER	115	1.024	72734	MERRMACK	115	1.035								

Case name: 2008-k0a1-base-d1
2005 NPCC LIBRARY
2008 SUMMER LIGHT 13398 MW
BASELINE SYSTEM - DISPATCH 1

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	695	-11
Orrington-South	1151	80
Surowiec-South	1141	-104
SUROWIEC-SOUTH Y138	1141	-104
Maine-New Hampshire	1102	-115
ME-NH Y138	1102	-115
Northern NE-Scobie + 394	1986	-29
Seabrook-South	1174	57
North-South	2088	-189
New York-New England	182	-153

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 637 MW																				
70060	MIS GT1	1	0	110	174	82	70061	MIS GT2	2	0	110	174	82	70062	MIS ST	3	0	118	194	92
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	1	8	1
70019	ELLSWORT	1	0	2	9	2	70040	GRAHAM 1	1	0	2	18	2	70066	PERC 138	1	0	2	20	2
70029	POWERSVI	1	0	5	0	0	70067	UP5 125	1	0	1	19	1	70070	UP6 125	1	0	1	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	0	16	0							
CMP WESTERN GEN TOTAL: 292 MW																				
70377	AEC G1	1	55	41	49	41	70378	AEC G2	2	55	41	0	0	70379	AEC G3	3	55	41	0	0
70381	RPA CG1	1	179	120	0	0	70382	RPA SG2	2	93	70	0	0	70101	RUMFRDGN	1	7	0	0	0
70370	AEI GEN	1	39	3	34	3	70177	LWSTN GN	1	17	0	0	0	70425	MEADCOGN	1	110	34	85	34
70104	LEW LWR	1	30	3	23	3	70118	GULF ISL	1	34	0	0	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	12	70421	J/MILL B	1	35	19	23	-0
70420	J/MILL A	1	35	19	21	8	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 534 MW																				
70356	HARRIS#1	1	17	7	17	3	70357	HARRIS#2	2	37	15	35	6	70358	HARRIS#3	3	36	15	36	6
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	1	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	40	16
70391	REDCOLLW	1	45	9	45	5	70392	BNCOLLLW	1	45	9	45	4	70351	KIBBY G1	1	31	15	0	0
70352	KIBBY G2	2	31	15	0	0	70353	KIBBY G3	3	36	15	0	0	70354	KIBBY G4	4	31	15	0	0
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	6	4
70157	GUILF GN	1	15	0	22	0	70330	WINSLOW	2	8	0	6	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	42	11	70422	WARRN G1	1	51	15	45	2
70423	WARRN G2	1	62	11	45	-0	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	20	63	20
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 30 MW																				
70222	TOPSHAM	1	20	3	0	0	70223	TOPSM GN	1	14	0	12	0	70223	TOPSM GN	2	14	0	18	0
CMP PORT/SOUTH GEN TOTAL: 317 MW																				
70127	SPRNG GN	1	11	0	3	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	0	0	70387	WBK G2	2	185	109	0	0	70388	WBK G3	3	196	94	0	0
70365	WF WY #1	1	57	14	52	4	70366	WF WY #2	2	57	14	32	4	70367	WF WY #3	3	125	55	94	8
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	11	42	11	70419	SDW #10G	1	16	4	14	4	70129	LOUDEN	1	37	0	27	0
70160	W.BUXTON	1	37	0	30	0	70162	SANFORD	1	2	1	0	0	70179	MERC GN	1	19	5	17	3
MAJOR NH GEN TOTAL: 1559 MW																				
72869	SBRK G1	1	1318	375	1318	270	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	1
72871	SCHILLER	5	50	25	50	1	72872	SCHILLER	6	48	25	48	1	72866	MERMK G1	1	113	53	96	7
72867	MERMK G2	2	320	150	0	0	71950	GRANRDG1	1	280	140	0	0	71951	GRANRDG2	2	280	140	0	0
72701	AESSTG	3	250	161	0	0	72702	CONEDG1	1	169	105	0	0	72703	CONEDG2	2	169	105	0	0
72704	CONEDG3	3	195	120	0	0														

SVD DATA

SVD Name	MVAR

CHESTER	31
ORRINGTN	134
MAXCYS1	100
MASON2	100
SUROWIEC	150
S.GORHAM	100
CROWLEYS	0
SANFORD	0

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.031	70001	CHESTER	345	1.004	70002	ORRINGTN	345	1.014	70003	MAXCYS	345	0.997
70086	ME YANK	345	1.010	70087	SUROWIEC	345	1.018	70088	WYMAN	345	1.018	70089	S.GORHAM	345	1.018
70090	BUXTON	345	1.017	70091	MASON	345	1.012	72692	NWGTN345	345	1.030	72697	LAWRENCE	345	1.023
72696	AMHST345	345	1.023	72695	TIMBR345	345	1.034	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.022
72691	DRFLD345	345	1.021	71786	SANDY PD	345	1.027	70027	ORRINGTN	115	1.030	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.016	70120	MAXCYS1	115	1.041	70121	MASON1	115	1.041	70125	SUROWIEC	115	1.040
70165	S.GORHAM	115	1.042	70130	Q HILL	115	1.029	70162	SANFORD	115	1.029	70185	WBK 115	115	1.039
72746	SCOBIE2	115	1.042	72718	DEERFELD	115	1.042	72754	3 RIVERS	115	1.028	72770	3 RIV 2	115	1.028
72745	SCHILLER	115	1.035	72734	MERRMACK	115	1.035								

Case name: 2008-k1a1-20wym-d1
2005 NPCC LIBRARY
2008 SUMMER LIGHT - 13398 MW - DISPATCH 1
KIBBY ON LINE WITH 20 MVAR CAPACITOR AT WYMAN HYDRO

INTERFACE FLOWS

Interface Name	MW	MVAR
New Brunswick-New England	695	-9
Orrington-South	1151	78
Surowiec-South	1142	-103
SUROWIEC-SOUTH Y138	1142	-103
Maine-New Hampshire	1102	-114
ME-NH Y138	1102	-114
Northern NE-Scobie + 394	1986	-29
Seabrook-South	1174	57
North-South	2088	-189
New York-New England	181	-153

GENERATION DATA

Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR	Bus #	Gen Name	ID	PMAX	QMAX	MW	MVAR
BHE GENERATION TOTAL: 637 MW																				
70060	MIS GT1	1	0	110	174	83	70061	MIS GT2	2	0	110	174	83	70062	MIS ST	3	0	118	194	93
70068	BEAVRWD	1	0	0	0	0	70017	CHESTER	1	0	1	5	1	70071	DPPRD	1	0	1	8	1
70019	ELLSWORT	1	0	2	9	2	70040	GRAHAM 1	1	0	2	18	2	70066	PERC 138	1	0	2	20	2
70029	POWERSVI	1	0	5	0	0	70067	UP5 125	1	0	1	19	1	70070	UP6 125	1	0	1	0	0
70023	WASH. CT	1	0	0	0	0	70069	WENFD 13	1	0	0	16	0							
CMP WESTERN GEN TOTAL: 292 MW																				
70377	AEC G1	1	55	41	49	41	70378	AEC G2	2	55	41	0	0	70379	AEC G3	3	55	41	0	0
70381	RPA CG1	1	179	120	0	0	70382	RPA SG2	2	93	70	0	0	70101	RUMFRDGN	1	7	0	0	0
70370	AEI GEN	1	39	3	34	3	70177	LWSTN GN	1	17	0	0	0	70425	MEADCOGN	1	110	34	85	34
70104	LEW LWR	1	30	3	23	3	70118	GULF ISL	1	34	0	0	0	70431	OTIS GEN	1	5	1	2	0
70428	JAY HYDR	1	3	1	1	1	70431	OTIS GEN	2	5	1	2	0	70359	IP RILEY	1	7	-2	1	-2
70427	LVRM HYD	1	6	1	1	1	70414	MEADBUS1	1	8	1	6	1	70412	MEAD UH2	1	8	1	6	1
70412	MEAD UH2	2	8	1	7	1	70415	MEADBUS2	1	8	1	6	1	70416	MEADBUS3	1	8	3	10	3
70413	MEAD UH1	1	8	1	7	1	70432	J/MILL C	1	40	20	31	12	70421	J/MILL B	1	35	19	23	-0
70420	J/MILL A	1	35	19	21	7	70421	J/MILL B	A	0	2	-3	2	70421	J/MILL B	B	0	2	-3	2
70421	J/MILL B	C	0	2	-3	2	70421	J/MILL B	D	0	2	-3	2	70421	J/MILL B	E	0	2	-3	2
70421	J/MILL B	F	0	2	-3	2														
CMP NORTHERN GEN TOTAL: 534 MW																				
70356	HARRIS#1	1	17	7	17	3	70357	HARRIS#2	2	37	15	35	5	70358	HARRIS#3	3	36	15	36	5
70360	WYMAN #1	1	27	12	26	12	70361	WYMAN #2	2	27	12	26	12	70362	WYMAN #3	3	25	12	25	12
70363	WILLM #1	1	8	1	7	1	70364	WILLM #2	2	7	1	6	1	70372	SEA STRN	1	47	25	0	0
70391	REDCOLLW	1	45	9	0	0	70392	BNCOLLLW	1	45	9	0	0	70351	KIBBY G1	1	31	15	31	4
70352	KIBBY G2	2	31	15	31	6	70353	KIBBY G3	3	36	15	36	5	70354	KIBBY G4	4	31	15	31	6
72683	MADSN UP	S	3	0	2	0	72685	MADSN G1	1	0	3	-6	3	72686	MADSN G2	1	0	3	-6	3
72687	MADSN G3	1	0	1	-3	1	72688	ANSON HY	2	2	0	2	0	72688	ANSON HY	3	2	0	2	0
72688	ANSON HY	1	2	0	2	0	72688	ANSON HY	5	2	0	0	0	72688	ANSON HY	4	2	0	0	0
72689	ABENAKI	4	2	0	2	0	72689	ABENAKI	R	0	-1	-1	-1	72689	ABENAKI	3	2	0	2	0
72689	ABENAKI	1	3	0	3	0	70142	RICERIPS	1	5	0	0	0	70147	LAKEWOOD	1	9	4	6	4
70157	GUILF GN	1	15	0	22	0	70330	WINSLOW	2	8	0	6	0	70330	WINSLOW	1	9	0	0	0
70330	WINSLOW	3	4	0	0	0	70330	WINSLOW	4	2	0	0	0	70410	HYDRO KN	2	9	0	0	0
70410	HYDRO KN	1	9	0	5	0	70355	ATHENS	1	42	40	42	10	70422	WARRN G1	1	51	15	45	1
70423	WARRN G2	1	62	11	45	-0	70350	CHAMP EF	5	0	-1	-3	-1	70350	CHAMP EF	6	0	-1	-3	-1
70350	CHAMP EF	4	0	-1	-3	-1	70350	CHAMP EF	2	0	-1	-3	-1	70350	CHAMP EF	1	0	-1	-3	-1
70350	CHAMP EF	3	0	-1	-3	-1	70426	CHAMP G2	1	21	6	15	6	70424	CHAMP G3	3	72	20	63	20
70389	BUCKS G4	4	191	120	0	0														
CMP CENTRAL GEN TOTAL: 30 MW																				
70222	TOPSHAM	1	20	3	0	0	70223	TOPSM GN	1	14	0	12	0	70223	TOPSM GN	2	14	0	18	0
CMP PORT/SOUTH GEN TOTAL: 317 MW																				
70127	SPRNG GN	1	11	0	3	0	70140	CAPE	1	12	0	0	0	70140	CAPE	2	12	0	0	0
70386	WBK G1	1	185	109	0	0	70387	WBK G2	2	185	109	0	0	70388	WBK G3	3	196	94	0	0
70365	WF WY #1	1	57	14	52	14	70366	WF WY #2	2	57	14	32	14	70367	WF WY #3	3	125	55	94	-11
70368	WF WY #4	4	636	242	0	0	70417	SDW #8GN	2	1	0	1	0	70417	SDW #8GN	1	11	0	6	0
70418	SDW #9GN	1	51	11	42	11	70419	SDW #10G	1	16	4	14	4	70129	LOUDEN	1	37	0	27	0
70160	W.BUXTON	1	37	0	30	0	70162	SANFORD	1	2	1	0	0	70179	MERC GN	1	19	5	17	3
MAJOR NH GEN TOTAL: 1559 MW																				
72869	SBRK G1	1	1318	375	1318	270	72868	NWNGT G1	1	422	180	0	0	72870	SCHILLER	4	48	25	48	1
72871	SCHILLER	5	50	25	50	1	72872	SCHILLER	6	48	25	48	1	72866	MERMK G1	1	113	53	96	7
72867	MERMK G2	2	320	150	0	0	71950	GRANRDG1	1	280	140	0	0	71951	GRANRDG2	2	280	140	0	0
72701	AESSTG	3	250	161	0	0	72702	CONEDG1	1	169	105	0	0	72703	CONEDG2	2	169	105	0	0
72704	CONEDG3	3	195	120	0	0														

SVD DATA

SVD Name	MVAR

CHESTER	26
ORRINGTN	134
MAXCYS1	100
MASON2	100
SUROWIEC	150
S.GORHAM	100
CROWLEYS	0
SANFORD	0

BUS VOLTAGES

BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu	BusNo	Bus Name	Bkv	Vpu
87004	KESWICK	345	1.031	70001	CHESTER	345	1.002	70002	ORRINGTN	345	1.013	70003	MAXCYS	345	0.997
70086	ME YANK	345	1.010	70087	SUROWIEC	345	1.018	70088	WYMAN	345	1.018	70089	S.GORHAM	345	1.019
70090	BUXTON	345	1.018	70091	MASON	345	1.012	72692	NWGTN345	345	1.030	72697	LAWRENCE	345	1.023
72696	AMHST345	345	1.023	72695	TIMBR345	345	1.034	72694	SEBRK345	345	1.035	72693	SCOB 345	345	1.022
72691	DRFLD345	345	1.021	71786	SANDY PD	345	1.027	70027	ORRINGTN	115	1.030	70028	GRAHAM 1	115	1.052
70210	BUCKSPOR	115	1.016	70120	MAXCYS1	115	1.041	70121	MASON1	115	1.041	70125	SUROWIEC	115	1.041
70165	S.GORHAM	115	1.042	70130	Q HILL	115	1.029	70162	SANFORD	115	1.029	70185	WBK 115	115	1.039
72746	SCOBIE2	115	1.042	72718	DEERFELD	115	1.042	72754	3 RIVERS	115	1.028	72770	3 RIV 2	115	1.028
72745	SCHILLER	115	1.035	72734	MERRMACK	115	1.035								

APPENDIX B – Base Case Draw Files

Included in Appendix B:

2008 Summer Peak Load – Dispatch 1:

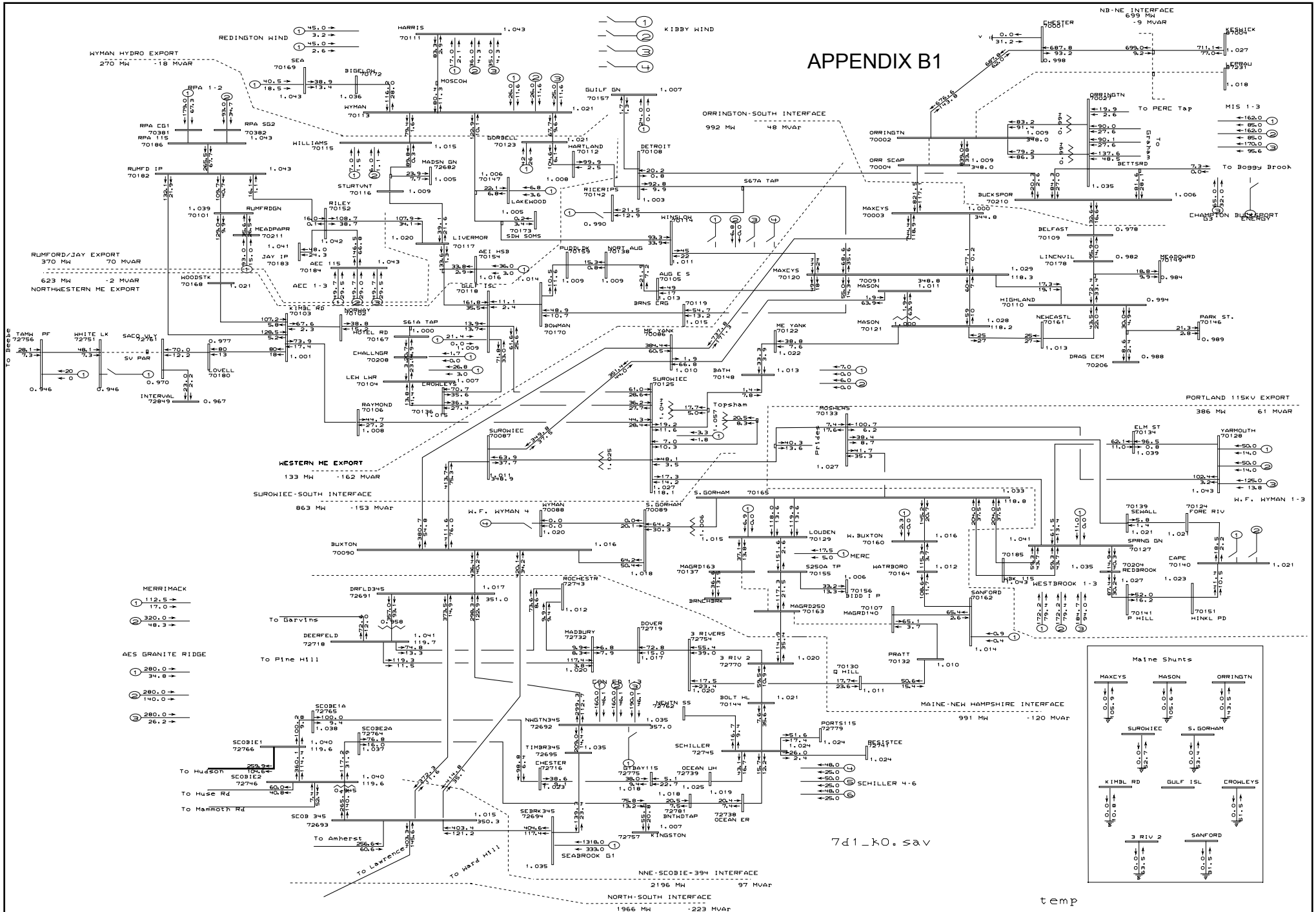
Appendix B-1: Athens on – NRI/Y138 out – Baseline
Appendix B-2: Athens on – NRI/Y138 out – Project in service

Appendix B-3: Athens off – NRI/Y138 out – Baseline
Appendix B-4: Athens off – NRI/Y138 out – Project in service
Appendix B-5: Athens off – NRI/Y138 out – Project with 25 MVAr @ Wyman
Appendix B-6: Athens off – NRI/Y138 out – Project with 30 MVAr @ Kibby
Appendix B-7: Athens off – NRI/Y138 out – Project with 14 MVAr @ 34.5 kV

Appendix B-8: Athens on – NRI/Y138 in – Baseline
Appendix B-9: Athens on – NRI/Y138 in – Project in service

2008 Summer Light Load – Dispatch 1:

Appendix B-10: Athens on – NRI/Y138 out – Baseline
Appendix B-11: Athens on – NRI/Y138 out – Project in service


APPENDIX B1
NB-NE INTERFACE
699 MW -9 MVAR
ORRINGTON-SOUTH INTERFACE
992 MW 48 MVAR
SUROWIEC-SOUTH INTERFACE
863 MW -153 MVAR
WESTERN ME EXPORT
133 MW -162 MVAR
PORTLAND 115KV EXPORT
386 MW 61 MVAR
MAINE-NEW HAMPSHIRE INTERFACE
991 MW -120 MVAR
NNE-SCOBIE-394 INTERFACE
2196 MW 97 MVAR
NORTH-SOUTH INTERFACE
1966 MW -223 MVAR
WYMAN HYDRO EXPORT
270 MW -18 MVAR
RUMFORD/JAY EXPORT
370 MW 70 MVAR
623 MW -2 MVAR
NORTHWESTERN ME EXPORT
REDINGTON WIND
KIBBY WIND
To Beebe
To Garvins
To Pine Hill
To Hudson
To Huse Rd
To Mammoth Rd
To Amherst
To Lawrence
To Ward Hill
To PERC Tap
To Boggy Brook
Maine Shunts
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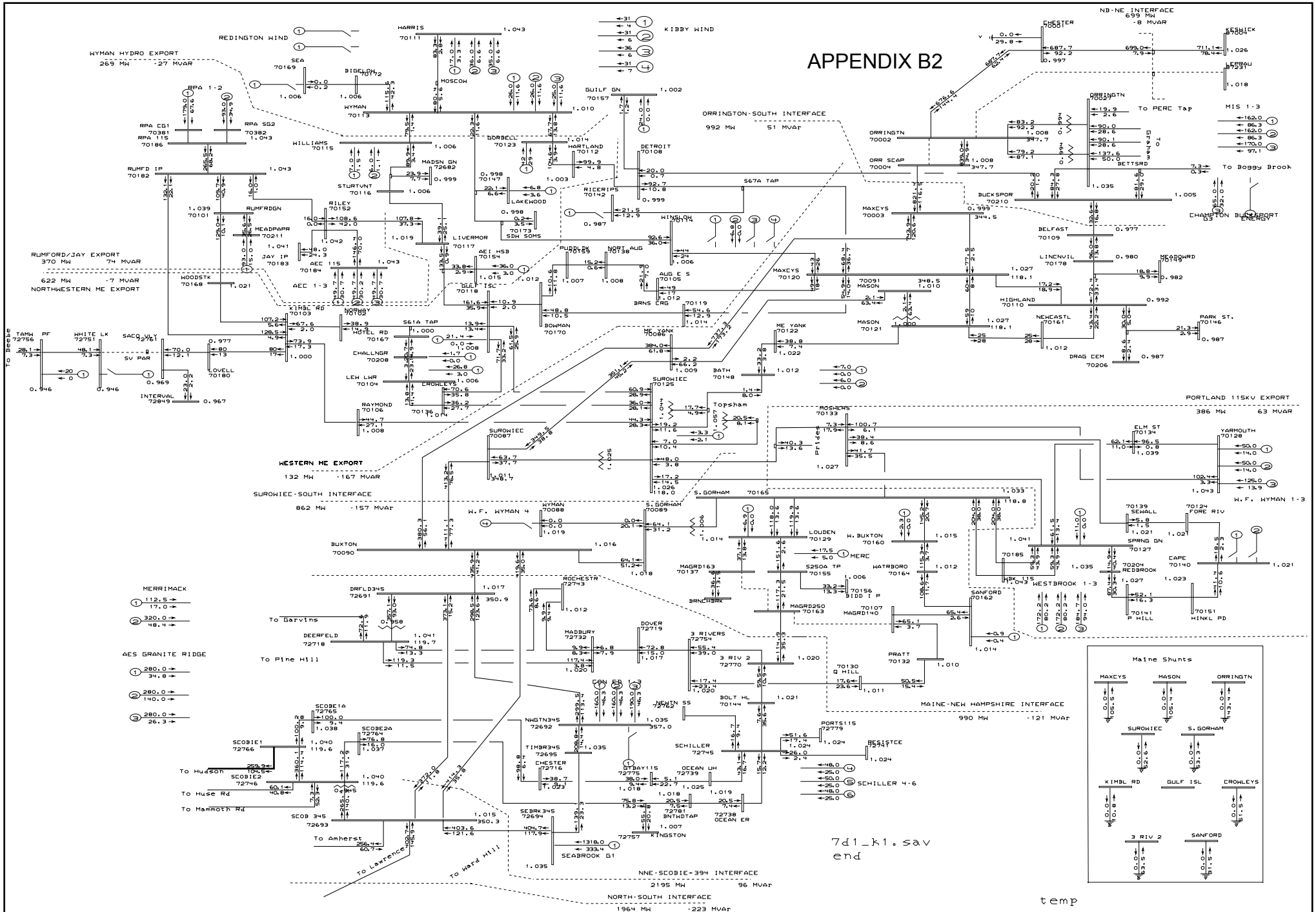
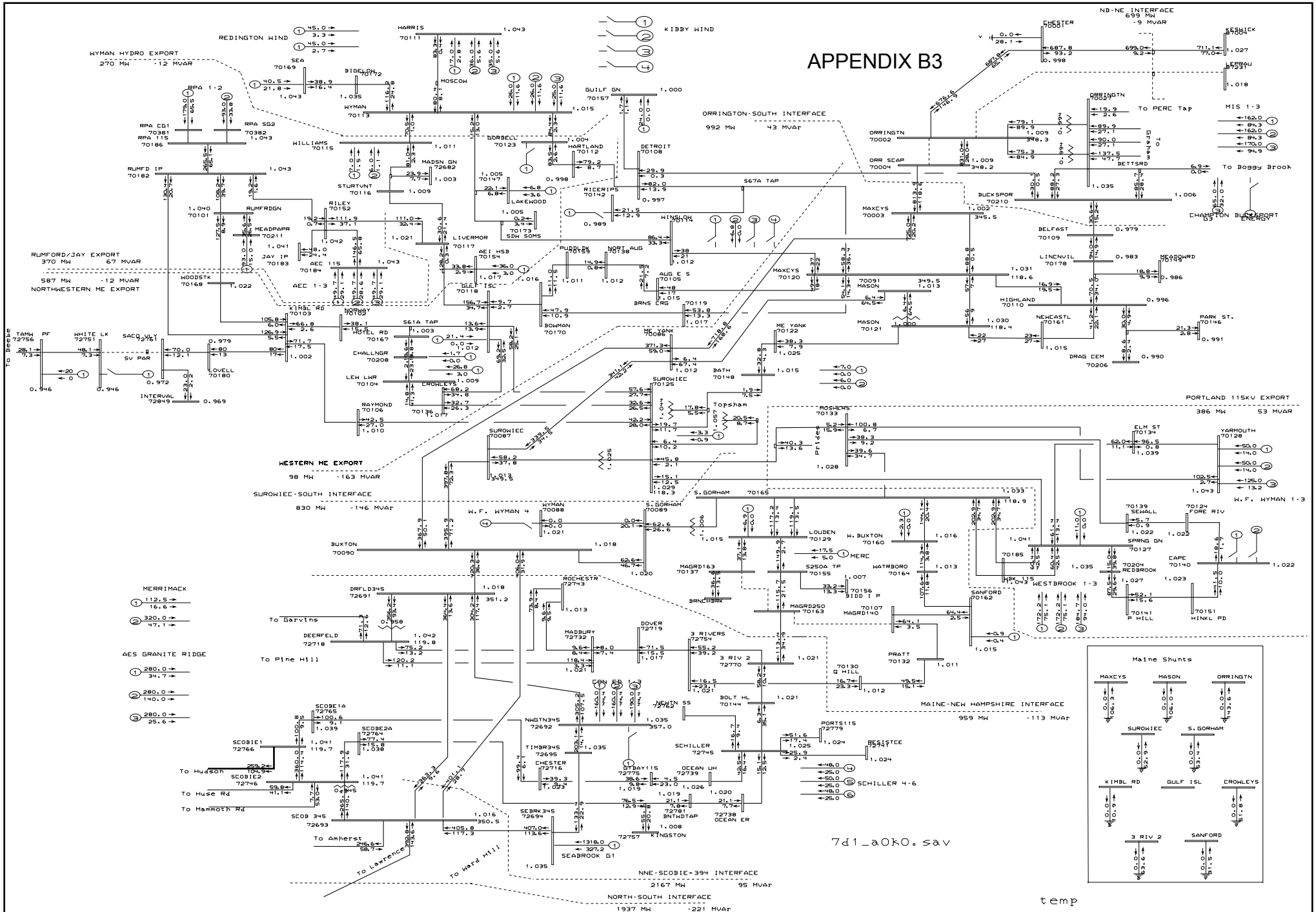

APPENDIX B2
NB-NE INTERFACE
699 MW -8 MVAR
WYMAN HYDRO EXPORT
269 MW -27 MVAR
REDINGTON WIND
KIBBY WIND
ORRINGTON-SOUTH INTERFACE
992 MW 51 MVAR
RUMFORD/JAY EXPORT
370 MW 74 MVAR
622 MW -7 MVAR
NORTHWESTERN ME EXPORT
WESTERN ME EXPORT
132 MW -167 MVAR
SUROWIEC-SOUTH INTERFACE
862 MW -157 MVAR
PORTLAND 115KV EXPORT
386 MW 63 MVAR
MAINE-NEW HAMPSHIRE INTERFACE
990 MW -121 MVAR
NNE-SCOBIE-394 INTERFACE
2195 MW 96 MVAR
NORTH-SOUTH INTERFACE
1964 MW -223 MVAR
To Beebe
To Garvins
To Pine Hill
To Hudson
To Huse Rd
To Mammoth Rd
To Amherst
To Lawrence
To Ward Hill
To PERC Tap
To Boggy Brook
Maine Shunts
7d1_k1.sav
end
temp
temp.wrk
MW/MVAR
Fri May 05 09:14:08 2006
2005 NPCC LIBRARY-2011 SUMMER PEAK
Base Case
PSLF Program
me345115-y138-kibby.
Rating - 1



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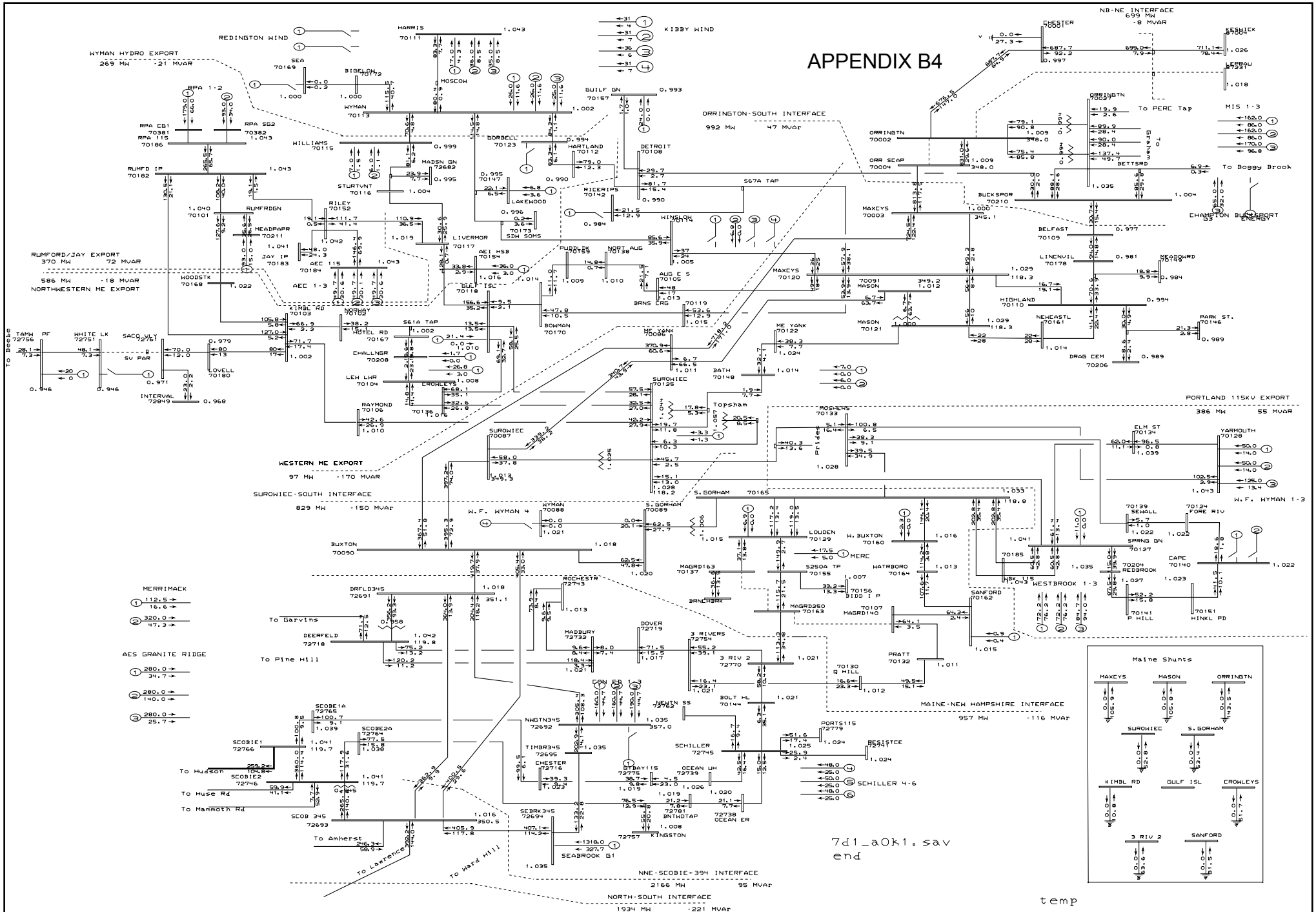
2005 NPCC LIBRARY-2011 SUMMER PEAK

Base Case

PSLF Program

me345115-y138-kibby.

Rating - 1



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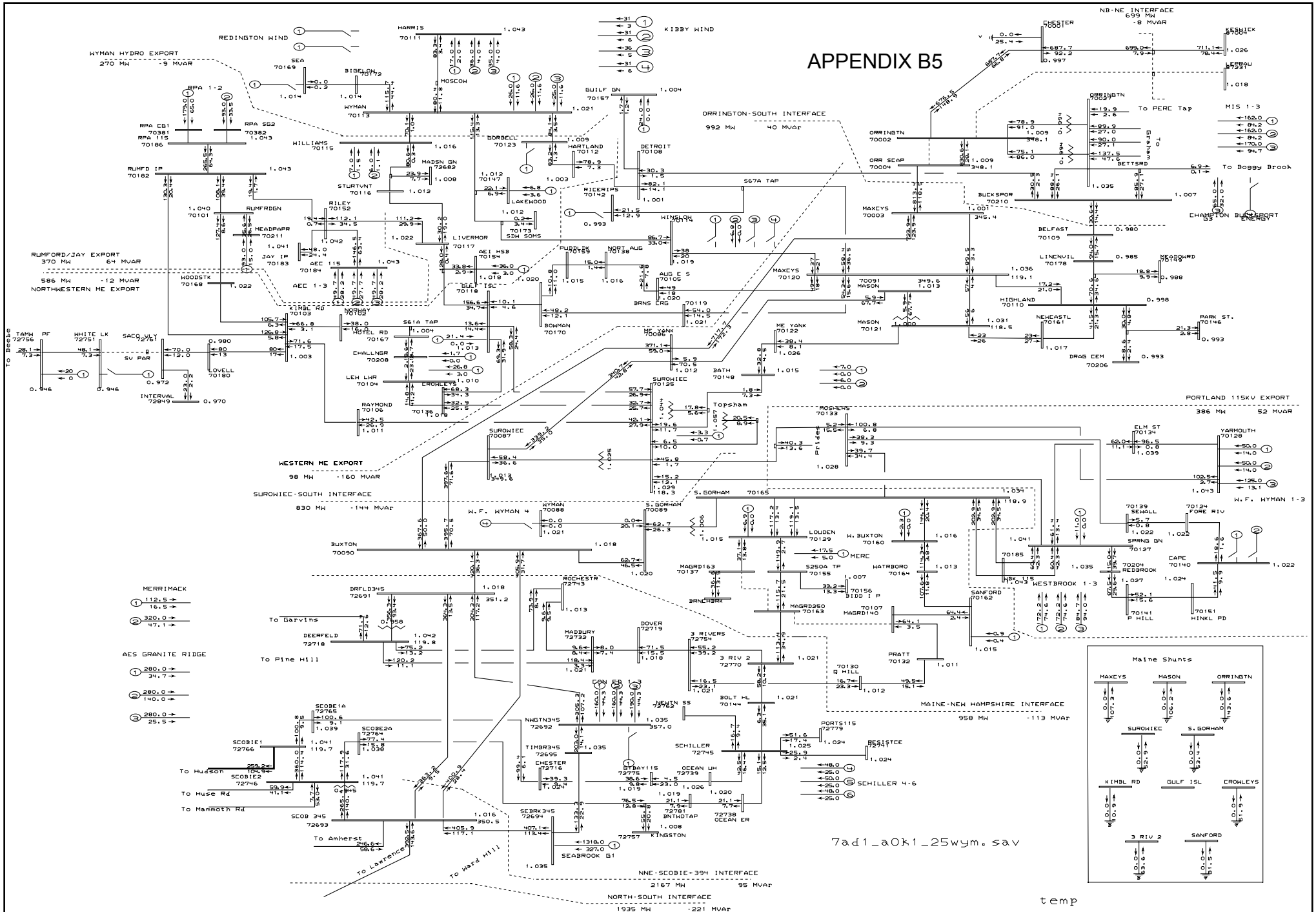
2005 NPCC LIBRARY-2011 SUMMER PEAK

Base Case

PSLF Program

me345115-y138-kibby.

Rating - 1



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MW/MVAR

Fri May 05 13:55:29 2006

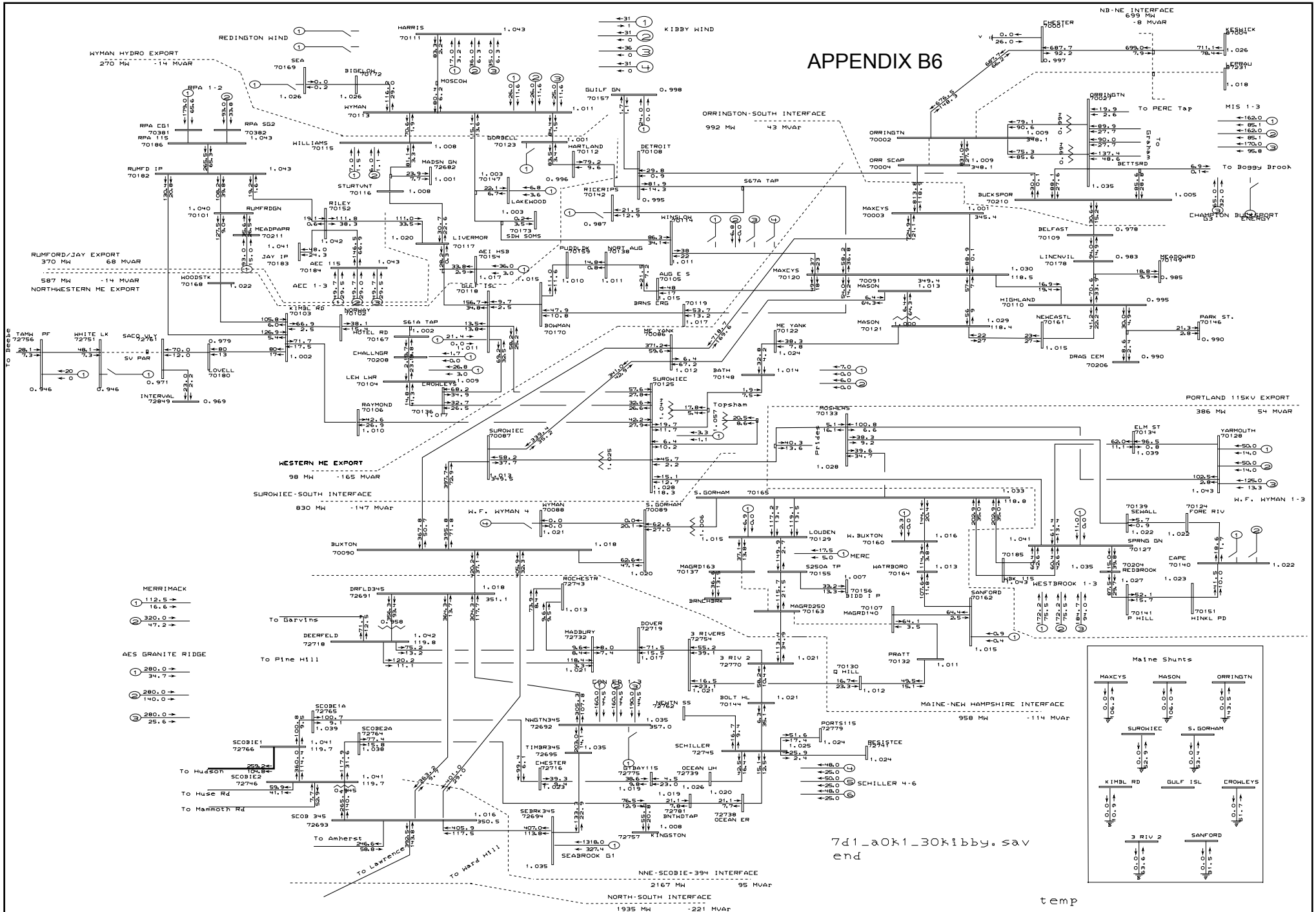
2005 NPCC LIBRARY-2011 SUMMER PEAK

Base Case

PSLF Program

me345115-y138-kibby.

Rating - 1



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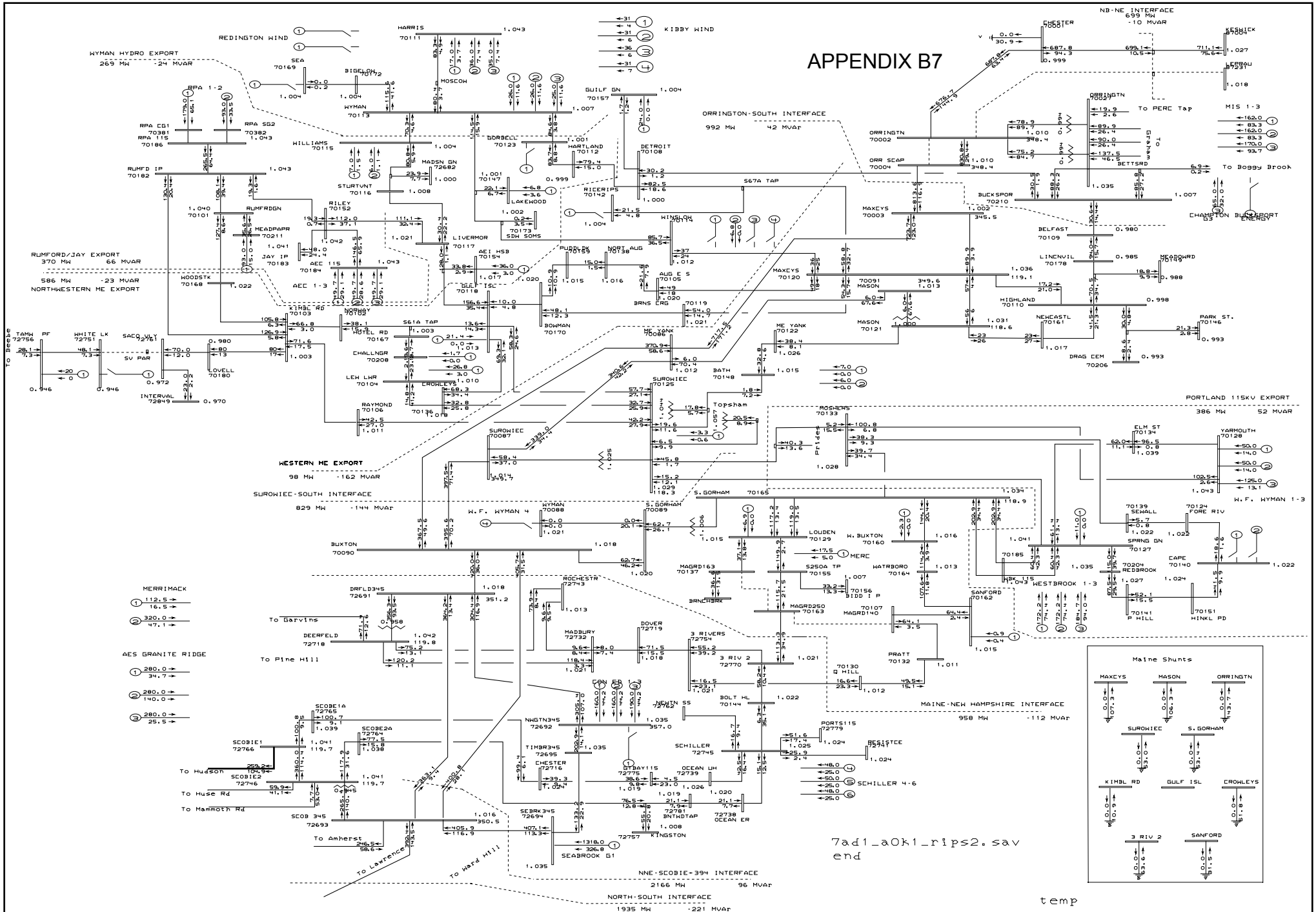

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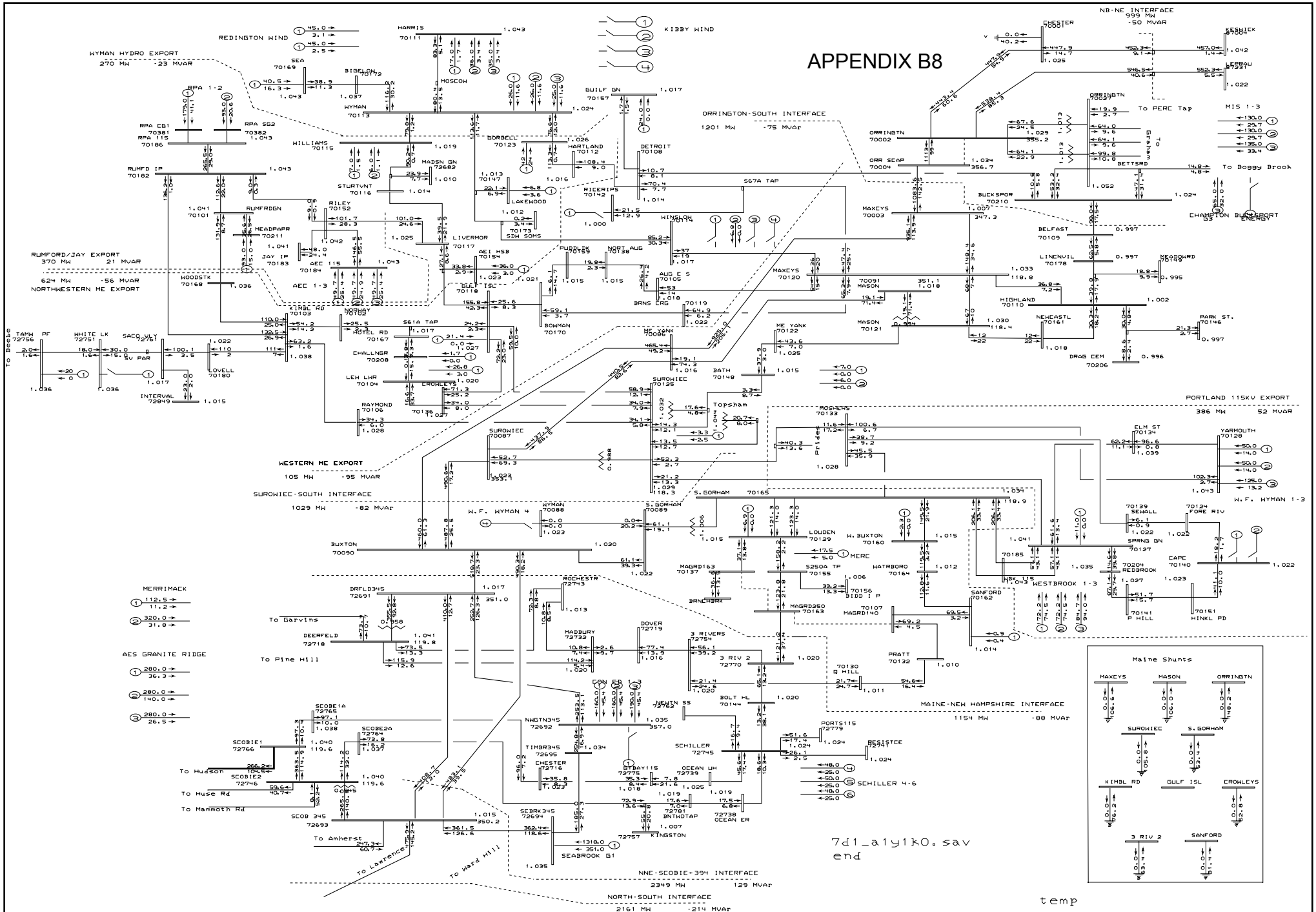
2005 NPCC LIBRARY-2011 SUMMER PEAK

Base Case

PSLF Program

me345115-y138-kibby.

Rating = 1



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2005 NPCC LIBRARY-2011 SUMMER PEAK

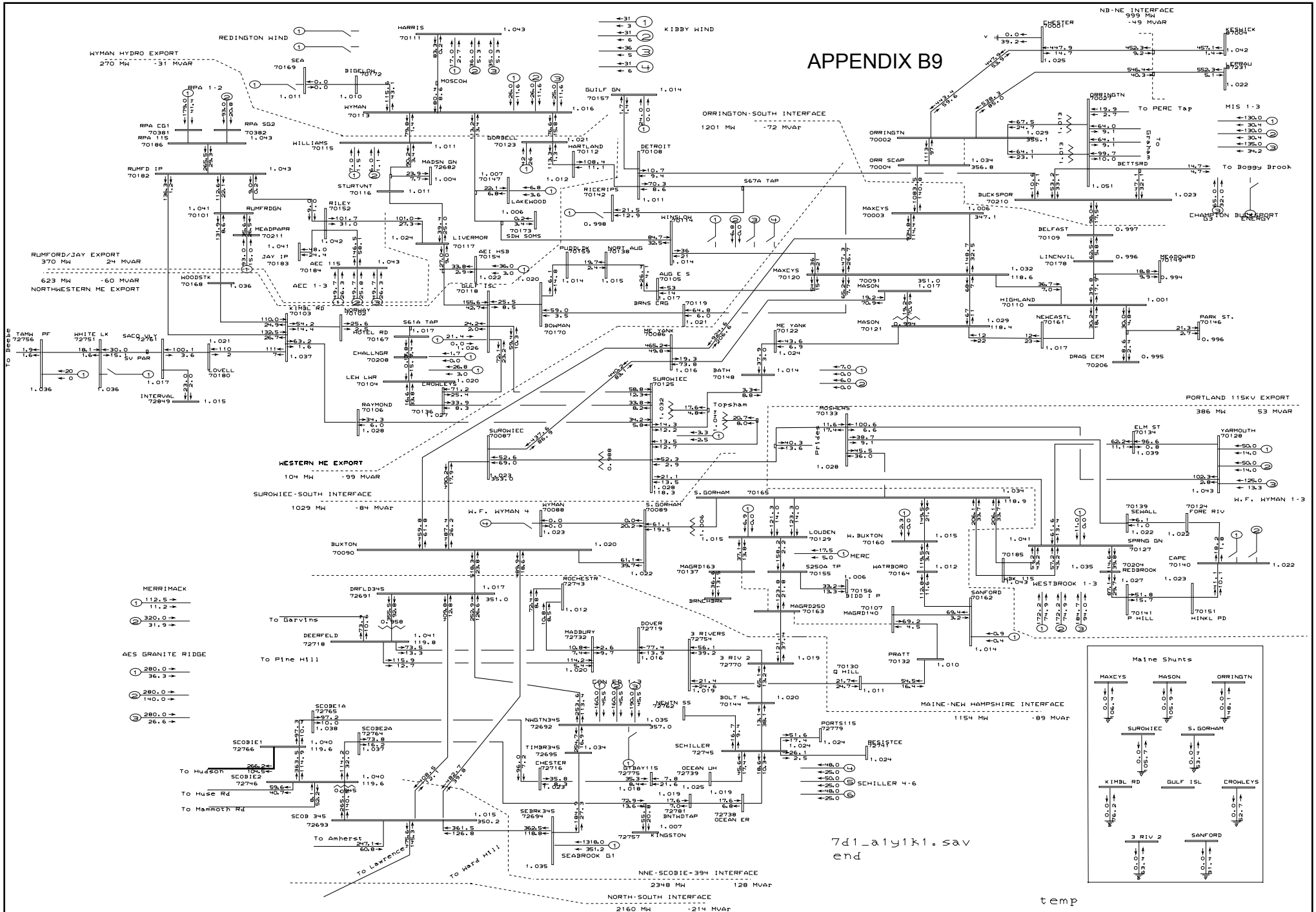
Base Case

Kibby off-Athens on-NRI/Y138 in service

PSLF Program

me345115-y138-kibby.

Rating = 1



temp.wrk MW/MVAR Fri May 05 14:31:29 2006

2005 NPCC LIBRARY-2011 SUMMER PEAK

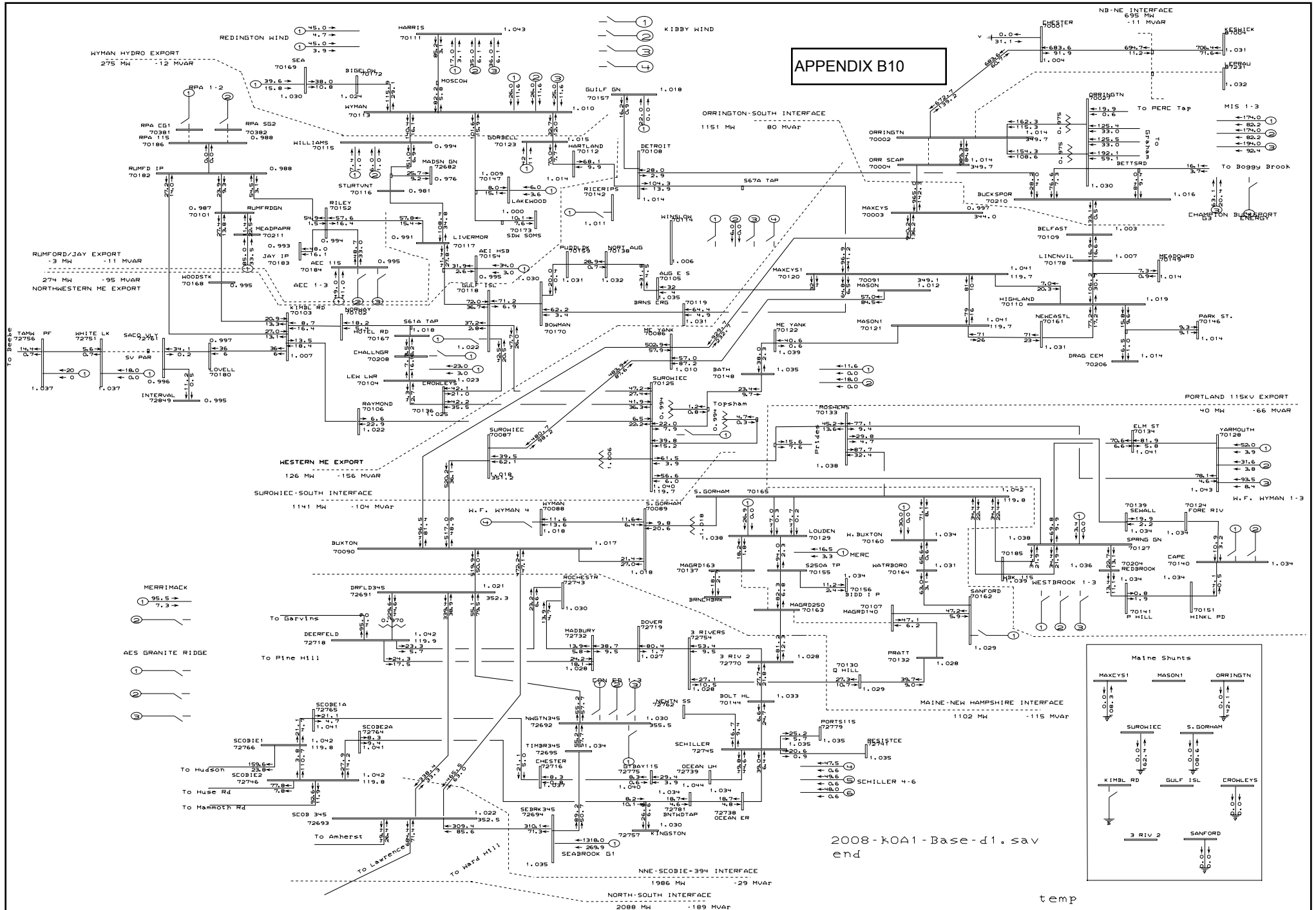
Base Case

Kibby on-Athens on-NRI/Y138 in service

PSLF Program

me345115-y138-kibby.

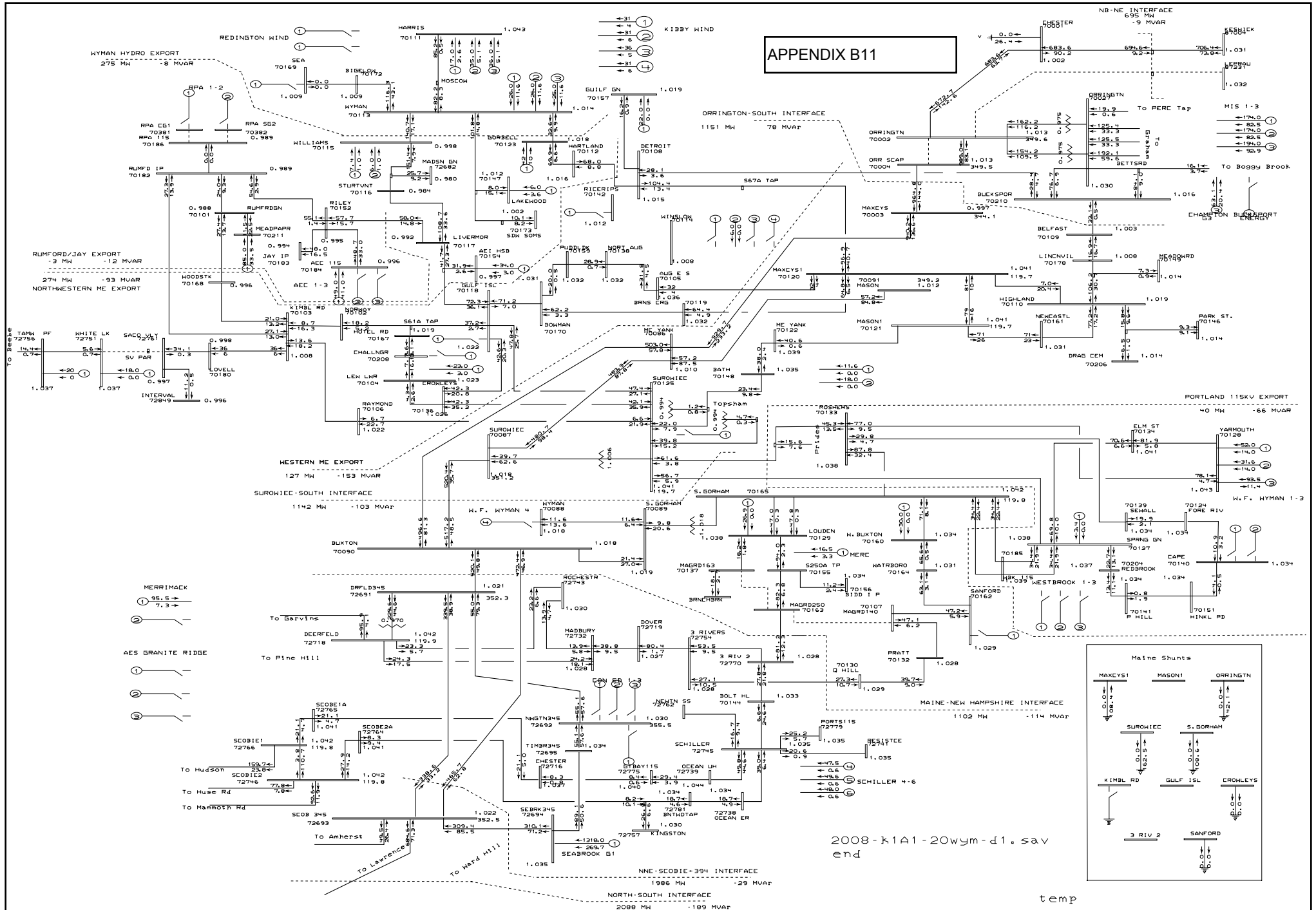
Rating = 1



temp.wrk | MW/MVAR | Fri May 12 16:17:48 2006

2005 NPCC LIBRARY
2011 SUMMER LIGHT
Base Case

PSLF Program
me345115-y138-kibby.
Rating = 1



temp.wrk MW/MVAR Fri May 12 16:26:38 2006

2005 NPCC LIBRARY
2011 SUMMER LIGHT
Base Case

PSLF Program
me345115-y138-kibby.
Rating - 1

APPENDIX C – Contingency Descriptions

APPENDIX C
Kibby Mountain Wind Farm Contingency List

345 kV Contingencies (single element)	
Auto Surowiec T1	L/O Surowiec T1
Auto Maxcys T3	L/O Maxcys T3
Auto Mason T9	L/O Mason Auto T9
345L Sect 375	Loss of Sect 375: Maine Yankee x Buxton
345L Sect 377	Loss of Sect 377: Maine Yankee x Surowiec
345L Sect 374	Loss of Sect 374: Surowiec x Buxton
345L Sect 385	Loss of Sect 385: Buxton x Deerfield
345L Sect 391	Loss of Sect 391: Buxton x Scobie

345 kV Contingencies (multiple element)	
345B Sur Any	374, 377
345B Scob 9126	391, 326
345B Deerf 785	385, 307
345B Deerf 851	385,Deerfield T1
345B Deerf 72	307, 373
Surowiec T1 + caps	L/O Suro T1 caps
Maxcys T3 + caps	L/O Max T3 caps
Mason T9 + caps	L/O Mas T9 caps
Max SB KT3L-1	Maxcys T3 SB KT3L-1
Max SB KT3L-2	Maxcys T3 SB KT3L-2
Mason SB KT9L-1	L/O Mason Auto T1 SB KT9L-1
Mason SB KT9L-2	L/O Mason Auto T1 SB KT9L-2

115 kV Contingencies (single element)	
Line Sect 87	Line Sect 87
Line Sect 61-61A	Hotel Road
Line Sect 62	Line Sect 62: Crowleys to Surowiec
Line Sect 63	Line Sect 63:Wyman to Livermore Falls
Line Sect 64	Line Sect 64: Gulf Island to Surowiec
Line Sect 65	Line Sect 65: Orrington to Bucksport
Line Sect 66	Line Sect 66: Wyman to Detroit
Line Sect 67-67A	Line Sect 67: Maxcys to Deptroit
Line Sect 69	Line Sect 69: Topsham to Suroweic
Line Sect 75	Line Sect 75: Hotel Rd to Lewiston
Line Sect 81	Line Sect 81:Surowiec to Mason
Line Sect 83	Line Sect 83: Winslow to Wyman
Line Sect 84	Line Sect 84: Winslow to Maxcys
Line Sect 89	Line Sect 89
Line Sect 166	Line Sect 166
Line Sect 167	Moshers/S167A-PridesCnr
Line Sect 200	Line Sect 200:

115 kV Contingencies (single element) continued	
Line Sect 201	Line Sect 201
Line Sect 202	Line Sect 202
Line Sect 203	Line Sect 203
Line Sect 208	Line Sect 208
Line Sect 208&209	Line Sect 208 & 209 Raymond to Surowiec
Line Sect 209	Line Sect 209
Line Sect 210	Line Sect 210
Line Sect 210&211	Line Sect 210 & 211
Line Sect 211	Line Sect 211
Line Sect 212	Line Sect 212
Line Sect 217	Line Sect 217
Line Sect 228	Line Sect 228
Line Sect 229	Line Sect 229

115 kV Contingencies (multiple element)	
Sect 200 SB K200-4	Sect 200 SB K200-4
Sect 63 SB K63-2	Sect 63 SB K63-2
Sect 89 SB K89-1	Sect 89 SB K89-1 or bus fault
Sect 200 SB K200-1	Sect 200 SB K200-1
Gulf Island any SB not K200-1	Gulf Island any SB not K200-1
Bucksport SB KBS1/2	Bucksport Bus SB KBS1/2
Detroit Bus SB K85-1 or K203-1	Detroit Bus SB K85-1 or K203-1
Sect 67 SB K67-1	Sect 67SB K67-1
Sect 66 SB K66-6	Line Sect 66 SB K66-6
Sect 83 SB K83-1	Sect 83 SB K83-1
Sect 84 SB K84-1	Sect 84 SB K84-1

115 kV Contingencies (specific to Alternative D)	
Wym2Livermore	Wyman to Livermore Falls
LvFlsSB200_63	Livermore Falls SB 200 and 63
LvFlsSB63_200	Livermore Falls SB 63 and 200
LvFlsSB200_new	Livermore Falls SB 200 and NEW
LvFlsSB89_new	Livermore Falls SB 89 and NEW
LvFlsSB63_89	Livermore Falls SB 63 and 89 term
LvFlsSB89_63	Livermore Falls SB 89 and 63 term

115 kV Contingencies (specific to Alternative E)	
SEA 2 Rum	Stratton to Rumford
215A	Stratton to Bigelow
215	Wyman to Bigelow

APPENDIX D – Post Contingency Voltage Results Comparison of Baseline and Project Cases

Included in Appendix D:

2008 Summer Peak – Dispatch 1:
Appendix D-1: Athens on – NRI/Y138 out
Appendix D-2: Athens off – NRI/Y138 out
Appendix D-3: Athens on – NRI/Y138 in

2008 Summer Light – Dispatch 1:
Appendix D-4: Athens on – NRI/Y138 out

Interpretation of entries in the voltage tables:

- For each bus entry, at least one of the comparison cases represents a violation of criteria
- Voltages less than 0.92pu are colored blue
- Voltages greater than 0.92 and less than 0.95 are colored green
- Voltages greater than 1.05 are colored red

High >1.05pu
Low < 0.95pu
High BHE >1.06pu

Kibby Wind Feasibility Study
Contingency Analysis Voltage Results
Y138 & NRI not in service - Athens on
Appendix D1
Dispatch 1

Sorted by
Contingency

Outage Name	*Bus*	*Name*	*KV*	*Baseline*	*Kibby on*
base	70102	NORWAY	115	0.999	0.998
base	70109	BELFAST	115	0.980	0.979
base	70110	HIGHLAND	115	0.997	0.996
base	70142	RICERIPS	115	0.995	0.992
base	70146	PARK ST.	115	0.992	0.991
base	70149	MEADOWRD	115	0.987	0.986
base	70178	LINCNVIL	115	0.984	0.983
base	70180	LOVELL	115	0.978	0.978
base	70206	DRAG CEM	115	0.992	0.991
Bucksport SB KBS	70109	BELFAST	115	0.944	0.944
Gulf Island any	70180	LOVELL	115	0.941	0.940
Line Sect 202	70104	LEW LWR	115	0.940	0.939
Line Sect 202	70177	LWSTN GN	115	0.940	0.939
Line Sect 202	70208	CHALLNGR	115	0.942	0.941
Line Sect 228	70101	RUMFRDGN	115	0.915	0.915
Line Sect 228	70168	WOODSTK	115	0.941	0.941
Line Sect 228	70180	LOVELL	115	0.950	0.950
Line Sect 228	70211	MEADPAPR	115	0.913	0.913
Max SB KT3L-1	70142	RICERIPS	115	0.950	0.947
Maxcys T3 + caps	70142	RICERIPS	115	0.941	0.937
Sect 200 SB K200	70180	LOVELL	115	0.943	0.943

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

High >1.05pu
Low < 0.95pu
High BHE >1.06pu

Kibby Wind Feasibility Study
Contingency Analysis Voltage Results
Y138 & NRI not in service - Athens on
Appendix D1
Dispatch 1

Sorted by
Violation

Outage Name	*Bus*	*Name*	*KV*	*Baseline*	*Kibby on*
Bucksport SB KBS	70109	BELFAST	115	0.944	0.944
base	70109	BELFAST	115	0.980	0.979
Line Sect 202	70208	CHALLNGR	115	0.942	0.941
base	70206	DRAG CEM	115	0.992	0.991
base	70110	HIGHLAND	115	0.997	0.996
Line Sect 202	70104	LEW LWR	115	0.940	0.939
base	70178	LINCNVIL	115	0.984	0.983
Sect 200 SB K200	70180	LOVELL	115	0.943	0.943
Line Sect 228	70180	LOVELL	115	0.950	0.950
base	70180	LOVELL	115	0.978	0.978
Gulf Island any	70180	LOVELL	115	0.941	0.940
Line Sect 202	70177	LWSTN GN	115	0.940	0.939
base	70149	MEADOWRD	115	0.987	0.986
Line Sect 228	70211	MEADPAPR	115	0.913	0.913
base	70102	NORWAY	115	0.999	0.998
base	70146	PARK ST.	115	0.992	0.991
base	70142	RICERIPS	115	0.995	0.992
Max SB KT3L-1	70142	RICERIPS	115	0.950	0.947
Maxcys T3 + caps	70142	RICERIPS	115	0.941	0.937
Line Sect 228	70101	RUMFRDGN	115	0.915	0.915
Line Sect 228	70168	WOODSTK	115	0.941	0.941

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

Kibby Wind Feasibility Study
Contingency Analysis Voltage Results
Y138, NRI & Athens not in service
Appendix D2
Dispatch 1

High >1.05pu
Low < 0.95pu
High BHE >1.06pu

Sorted by

Contingency

Outage Name	*Bus*	*Name*	*KV*	*Baseline*	*Kibby on*	*Kibby on-spread-14 VMAr*	*Kibby on-Kibby-30 MVAr*	*Kibby on-WymH-25 MVAr*
base	70102	NORWAY	115	1.000	1.000	1.000	1.000	1.001
base	70108	DETROIT	115	0.998	0.994	1.001	0.997	1.001
base	70109	BELFAST	115	0.980	0.979	0.980	0.979	0.980
base	70110	HIGHLAND	115	0.998	0.998	0.998	0.997	0.998
base	70112	HARTLAND	115	0.999	0.993	0.999	0.997	1.003
base	70123	GORBELL	115	1.005	0.996	1.001	1.002	1.009
base	70142	RICERIPS	115	0.991	0.990	1.004	0.990	0.993
base	70146	PARK ST.	115	0.993	0.993	0.993	0.992	0.993
base	70147	LAKEWOOD	115	1.007	0.999	1.001	1.005	1.012
base	70149	MEADOWRD	115	0.987	0.987	0.988	0.987	0.988
base	70157	GUILF GN	115	1.001	0.997	1.004	1.000	1.004
base	70178	LINCNVIL	115	0.985	0.984	0.985	0.984	0.985
base	70180	LOVELL	115	0.980	0.979	0.980	0.979	0.980
base	70206	DRAG CEM	115	0.992	0.992	0.993	0.992	0.993
base	72682	MADSN GN	115	1.004	0.997	1.000	1.002	1.008
Bucksport SB KBS	70109	BELFAST	115	0.943	0.944	0.944	0.945	0.944
Gulf Island any	70180	LOVELL	115	0.946	0.944	0.944	0.946	0.947
Line Sect 202	70104	LEW LWR	115	0.941	0.941	0.942	0.941	0.942
Line Sect 202	70177	LWSTN GN	115	0.941	0.941	0.942	0.941	0.942
Line Sect 202	70208	CHALLNGR	115	0.944	0.943	0.944	0.943	0.944
Line Sect 217	70180	LOVELL	115	0.950	0.963	0.951	0.949	0.950
Line Sect 228	70101	RUMFRDGN	115	0.919	0.915	0.919	0.919	0.917
Line Sect 228	70168	WOODSTK	115	0.945	0.941	0.945	0.945	0.943
Line Sect 228	70211	MEADPAPR	115	0.917	0.914	0.917	0.918	0.915
Line Sect 83	70112	HARTLAND	115	0.956	0.945	0.953	0.953	0.959
Line Sect 83	70123	GORBELL	115	0.958	0.944	0.950	0.954	0.962

Outage Name	Bus	Name	KV	Baseline	Kibby on	Kibby on-spread-14 VMAr	Kibby on-Kibby-30 MVAr	Kibby on-WymH-25 MVAr
Max SB KT3L-1	70114	WINSLOW	115	0.960	0.950	0.954	0.957	0.963
Max SB KT3L-1	70142	RICERIPS	115	0.930	0.919	0.951	0.926	0.932
Max SB KT3L-1	70147	LAKEWOOD	115	0.960	0.945	0.951	0.955	0.963
Max SB KT3L-1	70173	SDW SOMS	115	0.955	0.942	0.948	0.951	0.959
Maxcys T3 + caps	70142	RICERIPS	115	0.934	0.927	0.946	0.932	0.935
Sect 200 SB K200	70180	LOVELL	115	0.946	0.945	0.945	0.945	0.946
Sect 83 SB K83-1	70123	GORBELL	115	0.963	0.949	0.953	0.958	0.966
Sect 89 SB K89-1	70116	STURTVNT	115	0.962	0.940	0.954	0.954	0.965
Sect 89 SB K89-1	72682	MADSN GN	115	0.970	0.948	0.960	0.962	0.973

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

Kibby Wind Feasibility Study
Contingency Analysis Voltage Results
Y138, NRI & Athens not in service
Appendix D2
Dispatch 1

High >1.05pu
Low < 0.95pu
High BHE >1.06pu

Sorted by

Violation

Outage Name	Bus	Name	KV	Baseline	Kibby on	Kibby on-spread-14 VMAr	Kibby on-Kibby-30 MVAr	Kibby on-WymH-25 MVAr
base	70109	BELFAST	115	0.980	0.979	0.980	0.979	0.980
Bucksport SB KBS	70109	BELFAST	115	0.943	0.944	0.944	0.945	0.944
Line Sect 202	70208	CHALLNGR	115	0.944	0.943	0.944	0.943	0.944
base	70108	DETROIT	115	0.998	0.994	1.001	0.997	1.001
base	70206	DRAG CEM	115	0.992	0.992	0.993	0.992	0.993
base	70123	GORBELL	115	1.005	0.996	1.001	1.002	1.009
Line Sect 83	70123	GORBELL	115	0.958	0.944	0.950	0.954	0.962
Sect 83 SB K83-1	70123	GORBELL	115	0.963	0.949	0.953	0.958	0.966
base	70157	GUILF GN	115	1.001	0.997	1.004	1.000	1.004
base	70112	HARTLAND	115	0.999	0.993	0.999	0.997	1.003
Line Sect 83	70112	HARTLAND	115	0.956	0.945	0.953	0.953	0.959
base	70110	HIGHLAND	115	0.998	0.998	0.998	0.997	0.998
Max SB KT3L-1	70147	LAKEWOOD	115	0.960	0.945	0.951	0.955	0.963
base	70147	LAKEWOOD	115	1.007	0.999	1.001	1.005	1.012
Line Sect 202	70104	LEW LWR	115	0.941	0.941	0.942	0.941	0.942
base	70178	LINCNVIL	115	0.985	0.984	0.985	0.984	0.985
base	70180	LOVELL	115	0.980	0.979	0.980	0.979	0.980
Line Sect 217	70180	LOVELL	115	0.950	0.963	0.951	0.949	0.950
Sect 200 SB K200	70180	LOVELL	115	0.946	0.945	0.945	0.945	0.946
Gulf Island any	70180	LOVELL	115	0.946	0.944	0.944	0.946	0.947
Line Sect 202	70177	LWSTN GN	115	0.941	0.941	0.942	0.941	0.942
Sect 89 SB K89-1	72682	MADSN GN	115	0.970	0.948	0.960	0.962	0.973
base	72682	MADSN GN	115	1.004	0.997	1.000	1.002	1.008
base	70149	MEADOWRD	115	0.987	0.987	0.988	0.987	0.988

Outage Name	Bus	Name	KV	Baseline	Kibby on	Kibby on-spread-14 VMAr	Kibby on-Kibby-30 MVAr	Kibby on-WymH-25 MVAr
Line Sect 228	70211	MEADPAPR	115	0.917	0.914	0.917	0.918	0.915
base	70102	NORWAY	115	1.000	1.000	1.000	1.000	1.001
base	70146	PARK ST.	115	0.993	0.993	0.993	0.992	0.993
base	70142	RICERIPS	115	0.991	0.990	1.004	0.990	0.993
Max SB KT3L-1	70142	RICERIPS	115	0.930	0.919	0.951	0.926	0.932
Maxcys T3 + caps	70142	RICERIPS	115	0.934	0.927	0.946	0.932	0.935
Line Sect 228	70101	RUMFRDGN	115	0.919	0.915	0.919	0.919	0.917
Max SB KT3L-1	70173	SDW SOMS	115	0.955	0.942	0.948	0.951	0.959
Sect 89 SB K89-1	70116	STURTVNT	115	0.962	0.940	0.954	0.954	0.965
Max SB KT3L-1	70114	WINSLOW	115	0.960	0.950	0.954	0.957	0.963
Line Sect 228	70168	WOODSTK	115	0.945	0.941	0.945	0.945	0.943

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

High >1.05pu
Low < 0.95pu
High BHE >1.06pu

Kibby Wind Feasibility Study
Contingency Analysis Voltage Results
Y138, NRI, & Athens in service
Appendix D3
Dispatch 1

Sorted by
Contingency

Outage Name	Bus	Name	KV	Baseline	Kibby on
base	70109	BELFAST	115	0.997	0.997
base	70142	RICERIPS	115	1.000	0.998
base	70146	PARK ST.	115	0.997	0.996
base	70149	MEADOWRD	115	0.995	0.994
base	70178	LINCNVIL	115	0.997	0.996
base	70206	DRAG CEM	115	0.996	0.995
Bucksport SB KBS	70109	BELFAST	115	0.946	0.945

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

High >1.05pu
Low < 0.95pu
High BHE >1.06pu

Kibby Wind Feasibility Study
Contingency Analysis Voltage Results
Y138, NRI, & Athens in service
Appendix D3
Dispatch 1

Sorted by
Violation

Outage Name	*Bus*	*Name*	*KV*	*Baseline*	*Kibby on*
Bucksport SB KBS	70109	BELFAST	115	0.946	0.945
base	70109	BELFAST	115	0.997	0.997
base	70206	DRAG CEM	115	0.996	0.995
base	70178	LINCNVIL	115	0.997	0.996
base	70149	MEADOWRD	115	0.995	0.994
base	70146	PARK ST.	115	0.997	0.996
base	70142	RICERIPS	115	1.000	0.998

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

Appendix D4
Kibby Wind Farm Feasibililty Study
Contingency Analysis Voltage Results
Light Load Analysis
NRI & Y138 not in service, Athens on Dispatch 1

High >1.05pu
Low < 0.95pu
High BHE
>1.06pu

Sorted by
Contingency

Outage Name	*Bus*	*Name*	*KV*	*Baseline*	*Kibby on*	*Kibby on /20 MVAr @ Wym*
base	70003	MAXCYS	345	0.997	0.995	0.997
base	70101	RUMFRDGN	115	0.987	0.988	0.988
base	70115	WILLIAMS	115	0.994	0.987	0.998
base	70116	STURTVNT	115	0.981	0.979	0.984
base	70117	LIVERMOR	115	0.991	0.990	0.993
base	70154	AEI HSB	115	0.995	0.995	0.997
base	70168	WOODSTK	115	0.995	0.995	0.996
base	70173	SDW SOMS	115	1.000	0.997	1.002
base	70180	LOVELL	115	0.997	0.999	0.998
base	70183	JAY IP	115	0.993	0.993	0.994
base	70211	MEADPAPR	115	0.986	0.987	0.987
base	72682	MADSN GN	115	0.976	0.971	0.980
Detroit Bus SB K	70116	STURTVNT	115	0.949	0.944	0.951
Detroit Bus SB K	72682	MADSN GN	115	0.941	0.933	0.944
Gulf Island any	70101	RUMFRDGN	115	0.951	0.950	0.952
Gulf Island any	70211	MEADPAPR	115	0.950	0.949	0.951
Line Sect 228	70211	MEADPAPR	115	0.949	0.951	0.950
Line Sect 66	72682	MADSN GN	115	0.954	0.942	0.957
Line Sect 83	70115	WILLIAMS	115	0.944	0.930	0.945
Line Sect 83	70116	STURTVNT	115	0.930	0.921	0.930
Line Sect 83	70117	LIVERMOR	115	0.953	0.948	0.952
Line Sect 83	72682	MADSN GN	115	0.920	0.908	0.920
Line Sect 84	72682	MADSN GN	115	0.951	0.943	0.953
Max SB KT3L-1	72682	MADSN GN	115	0.947	0.941	0.950
Max SB KT3L-2	72682	MADSN GN	115	0.950	0.942	0.953
Maxcys T3 + caps	72682	MADSN GN	115	0.957	0.950	0.959
Sect 200 SB K200	70116	STURTVNT	115	0.955	0.949	0.959

Outage Name	Bus	Name	KV	Baseline	Kibby on	Kibby on /20 MVAr @ Wym
Sect 66 SB K66-6	72682	MADSN GN	115	0.954	0.944	0.958
Sect 67 SB K67-1	70116	STURTVNT	115	0.950	0.944	0.952
Sect 67 SB K67-1	72682	MADSN GN	115	0.942	0.934	0.944
Sect 83 SB K83-1	70115	WILLIAMS	115	0.944	0.930	0.945
Sect 83 SB K83-1	70116	STURTVNT	115	0.928	0.920	0.930
Sect 83 SB K83-1	70117	LIVERMOR	115	0.951	0.947	0.953
Sect 83 SB K83-1	72682	MADSN GN	115	0.919	0.907	0.921
Sect 84 SB K84-1	70116	STURTVNT	115	0.947	0.943	0.949
Sect 84 SB K84-1	72682	MADSN GN	115	0.941	0.933	0.943

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

Appendix D.4
Kibby Wind Farm Feasibililty Study
Contingency Analysis Voltage Results
Light Load Analysis
NRI & Y138 not in service, Athens on Dispatch 1

High >1.05pu
Low < 0.95pu
High BHE
>1.06pu

Sorted by
Violation

Outage Name	*Bus*	*Name*	*KV*	*Baseline*	*Kibby on*	*Kibby on /20 MVAr @ Wym*
base	70154	AEI HSB	115	0.995	0.995	0.997
base	70183	JAY IP	115	0.993	0.993	0.994
base	70117	LIVERMOR	115	0.991	0.990	0.993
Sect 83 SB K83-1	70117	LIVERMOR	115	0.951	0.947	0.953
Line Sect 83	70117	LIVERMOR	115	0.953	0.948	0.952
base	70180	LOVELL	115	0.997	0.999	0.998
Maxcys T3 + caps	72682	MADSN GN	115	0.957	0.950	0.959
Detroit Bus SB K	72682	MADSN GN	115	0.941	0.933	0.944
Sect 84 SB K84-1	72682	MADSN GN	115	0.941	0.933	0.943
base	72682	MADSN GN	115	0.976	0.971	0.980
Line Sect 83	72682	MADSN GN	115	0.920	0.908	0.920
Line Sect 84	72682	MADSN GN	115	0.951	0.943	0.953
Max SB KT3L-1	72682	MADSN GN	115	0.947	0.941	0.950
Max SB KT3L-2	72682	MADSN GN	115	0.950	0.942	0.953
Line Sect 66	72682	MADSN GN	115	0.954	0.942	0.957
Sect 66 SB K66-6	72682	MADSN GN	115	0.954	0.944	0.958
Sect 67 SB K67-1	72682	MADSN GN	115	0.942	0.934	0.944
Sect 83 SB K83-1	72682	MADSN GN	115	0.919	0.907	0.921
base	70003	MAXCYS	345	0.997	0.995	0.997
base	70211	MEADPAPR	115	0.986	0.987	0.987
Line Sect 228	70211	MEADPAPR	115	0.949	0.951	0.950
Gulf Island any	70211	MEADPAPR	115	0.950	0.949	0.951
Gulf Island any	70101	RUMFRDGN	115	0.951	0.950	0.952
base	70101	RUMFRDGN	115	0.987	0.988	0.988
base	70173	SDW SOMS	115	1.000	0.997	1.002
Detroit Bus SB K	70116	STURTVNT	115	0.949	0.944	0.951
Line Sect 83	70116	STURTVNT	115	0.930	0.921	0.930
Sect 200 SB K200	70116	STURTVNT	115	0.955	0.949	0.959

Outage Name	Bus	Name	KV	Baseline	Kibby on	Kibby on /20 MVAr @ Wym
Sect 67 SB K67-1	70116	STURTVNT	115	0.950	0.944	0.952
Sect 83 SB K83-1	70116	STURTVNT	115	0.928	0.920	0.930
Sect 84 SB K84-1	70116	STURTVNT	115	0.947	0.943	0.949
base	70116	STURTVNT	115	0.981	0.979	0.984
base	70115	WILLIAMS	115	0.994	0.987	0.998
Line Sect 83	70115	WILLIAMS	115	0.944	0.930	0.945
Sect 83 SB K83-1	70115	WILLIAMS	115	0.944	0.930	0.945
base	70168	WOODSTK	115	0.995	0.995	0.996

Color Key
voltage < 0.92 - blue
voltage > 0.92 and < 0.95 - green
voltage > 1.05 - red
difference > adverse impact threshold (0) - gray

APPENDIX E – Post Contingency Thermal Results Comparison of Baseline and Project Cases

Included in Appendix E:

2008 Summer Peak – Dispatch 1:
Appendix E-1: Athens on – NRI/Y138 out
Appendix E-2: Athens off – NRI/Y138 out
Appendix E-3: Athens on – NRI/Y138 in

2008 Summer Light – Dispatch 1:
Appendix E-4: Athens on – NRI/Y138 out

Interpretation of entries in the thermal table:

- For each branch entry, at least one of the comparison cases represents a loading greater than 95%
- Loadings greater than 100% are colored red

100% of STE

Kibby Wind Feasibility Study
Contingency Analysis Thermal Results
Y138 & NRI not in service - Athens on
Appendix E1
Dispatch 1

Sorted by
Contingency

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Percentage of Emergency Rating: Kibby on
Detroit Bus SB K	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	104.1	104.9
Detroit Bus SB K	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	104.9	105.8
Detroit Bus SB K	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	120.8	121.8
Gulf Island any	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	104.7	105.2
Line Sect 200	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	100.0	100.5
Line Sect 63	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	109.3	109.9
Line Sect 66	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	110.4	111.9
Line Sect 83	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	100.5	101.1
Max SB KT3L-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	102.0	102.2
Sect 200 SB K200	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	100.3	100.8
Sect 63 SB K63-2	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	108.9	109.9
Sect 66 SB K66-6	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	110.5	111.9
Sect 67 SB K67-1	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	103.6	104.4
Sect 67 SB K67-1	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	104.3	105.3
Sect 67 SB K67-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	120.2	121.3
Sect 83 SB K83-1	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	99.9	100.6

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

100% of STE

Kibby Wind Feasibility Study
Contingency Analysis Thermal Results
Y138 & NRI not in service - Athens on
Appendix E1
Dispatch 1

Sorted by
Violation

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Percentage of Emergency Rating: Kibby on
Line Sect 83	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	100.5	101.1
Sect 83 SB K83-1	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	99.9	100.6
Detroit Bus SB K	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	120.8	121.8
Gulf Island any	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	104.7	105.2
Line Sect 200	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	100.0	100.5
Line Sect 63	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	109.3	109.9
Line Sect 66	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	110.4	111.9
Max SB KT3L-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	102.0	102.2
Sect 200 SB K200	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	100.3	100.8
Sect 63 SB K63-2	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	108.9	109.9
Sect 66 SB K66-6	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	110.5	111.9
Sect 67 SB K67-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	120.2	121.3
Detroit Bus SB K	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	104.9	105.8
Sect 67 SB K67-1	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	104.3	105.3
Detroit Bus SB K	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	104.1	104.9
Sect 67 SB K67-1	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	103.6	104.4

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

100% of STE

Kibby Wind Feasibility Study

Contingency Analysis Thermal Results
Y138, NRI & Athens not in service
Appendix E2
Dispatch 1

Sorted by
Contingency

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Kibby on	Kibby on-spread-14 VMAr	Kibby on-Kibby-30 MVAr	Kibby on-WymH-25 MVAr
Detroit Bus SB K	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	109.0	110.4	110.4	109.6	108.4
Gulf Island any	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	99.5	100.3	99.9	99.8	99.1
Line Sect 63	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	102.5	104.0	103.5	103.0	101.9
Line Sect 66	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	110.2	111.6	111.6	110.8	109.6
Sect 63 SB K63-2	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	102.3	103.9	103.4	102.9	101.7
Sect 66 SB K66-6	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	110.2	111.7	111.6	110.8	109.7
Sect 67 SB K67-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	108.6	110.0	109.9	109.1	108.0

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

100% of STE

Kibby Wind Feasibility Study

Contingency Analysis Thermal Results
Y138, NRI & Athens not in service
Appendix E2
Dispatch 1

Sorted by
Violation

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Kibby on	Kibby on-spread-14 VMAr	Kibby on-Kibby-30 MVAr	Kibby on-WymH-25 MVAr
Detroit Bus SB K	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	109.0	110.4	110.4	109.6	108.4
Gulf Island any	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	99.5	100.3	99.9	99.8	99.1
Line Sect 63	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	102.5	104.0	103.5	103.0	101.9
Line Sect 66	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	110.2	111.6	111.6	110.8	109.6
Sect 63 SB K63-2	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	102.3	103.9	103.4	102.9	101.7
Sect 66 SB K66-6	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	110.2	111.7	111.6	110.8	109.7
Sect 67 SB K67-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.800	108.6	110.0	109.9	109.1	108.0

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

100% of STE

Kibby Wind Feasibility Study
Contingency Analysis Thermal Results
Y138, NRI, & Athens in service
Appendix E3
Dispatch 1

Sorted by
Contingency

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Percentage of Emergency Rating: Kibby on
Detroit Bus SB K	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	100.6	101.5
Detroit Bus SB K	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	101.4	102.3
Detroit Bus SB K	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	117.2	118.2
Line Sect 63	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	101.9	102.8
Line Sect 66	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	106.9	108.2
Line Sect 83	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	102.4	103.0
Line Sect 83	70108	DETROIT	115	70112	HARTLAND	115	1	171.8	100.5	101.1
Sect 63 SB K63-2	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	102.0	102.9
Sect 66 SB K66-6	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	106.7	108.1
Sect 67 SB K67-1	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	100.2	101.0
Sect 67 SB K67-1	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	100.9	101.8
Sect 67 SB K67-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	116.8	117.8
Sect 83 SB K83-1	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	101.6	102.2
Sect 83 SB K83-1	70108	DETROIT	115	70112	HARTLAND	115	1	171.8	99.7	100.3

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

100% of STE

Kibby Wind Feasibility Study
Contingency Analysis Thermal Results
Y138, NRI, & Athens in service
Appendix E3
Dispatch 1

Sorted by
Violation

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Percentage of Emergency Rating: Kibby on
Line Sect 83	70108	DETROIT	115	70112	HARTLAND	115	1	171.8	100.5	101.1
Sect 83 SB K83-1	70108	DETROIT	115	70112	HARTLAND	115	1	171.8	99.7	100.3
Line Sect 83	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	102.4	103.0
Sect 83 SB K83-1	70112	HARTLAND	115	70123	GORBELL	115	1	171.8	101.6	102.2
Detroit Bus SB K	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	117.2	118.2
Line Sect 63	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	101.9	102.8
Line Sect 66	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	106.9	108.2
Sect 63 SB K63-2	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	102.0	102.9
Sect 66 SB K66-6	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	106.7	108.1
Sect 67 SB K67-1	70113	WYMAN	115	70181	S83B TAP	115	1	142.8	116.8	117.8
Detroit Bus SB K	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	101.4	102.3
Sect 67 SB K67-1	70114	WINSLOW	115	70150	S83C TAP	115	1	142.8	100.9	101.8
Detroit Bus SB K	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	100.6	101.5
Sect 67 SB K67-1	70150	S83C TAP	115	70181	S83B TAP	115	1	142.8	100.2	101.0

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

Appendix E4
Kibby Wind Farm Feasibililty Study
Contingency Analysis Thermal Results
Light Load Analysis
NRI & Y138 not in service, Athens on Dispatch 1

100% of LTE

Sorted by
Contingency

Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Kibby on	Kibby on /20 MVAr @ Wym
Detroit Bus SB K	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	109.7	110.7	109.6
Detroit Bus SB K	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	102.5	103.3	102.4
Line Sect 66	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	98.9	100.0	98.7
Line Sect 67-67A	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	101.2	101.7	101.1
Line Sect 83	70116	STURTVNT	115	70171	S 63B TP	115	1	171.8	102.0	103.1	102.0
Line Sect 83	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	117.5	118.6	117.6
Line Sect 83	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	110.1	111.1	110.2
Line Sect 84	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	104.6	105.3	104.5
Max SB KT3L-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	102.8	103.5	102.8
Max SB KT3L-2	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	106.0	106.7	106.0
Sect 67 SB K67-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	109.7	110.7	109.6
Sect 67 SB K67-1	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	102.5	103.3	102.4
Sect 83 SB K83-1	70116	STURTVNT	115	70171	S 63B TP	115	1	171.8	102.3	103.3	102.4
Sect 83 SB K83-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	117.9	119.0	117.9
Sect 83 SB K83-1	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	110.5	111.4	110.5
Sect 84 SB K84-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	111.3	111.9	111.2
Sect 84 SB K84-1	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	104.0	104.6	104.0

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

Appendix E.4
Kibby Wind Farm Feasibililty Study
Contingency Analysis Thermal Results
Light Load Analysis
NRI & Y138 not in service, Athens on Dispatch 1

100% of LTE

Sorted by
Violation

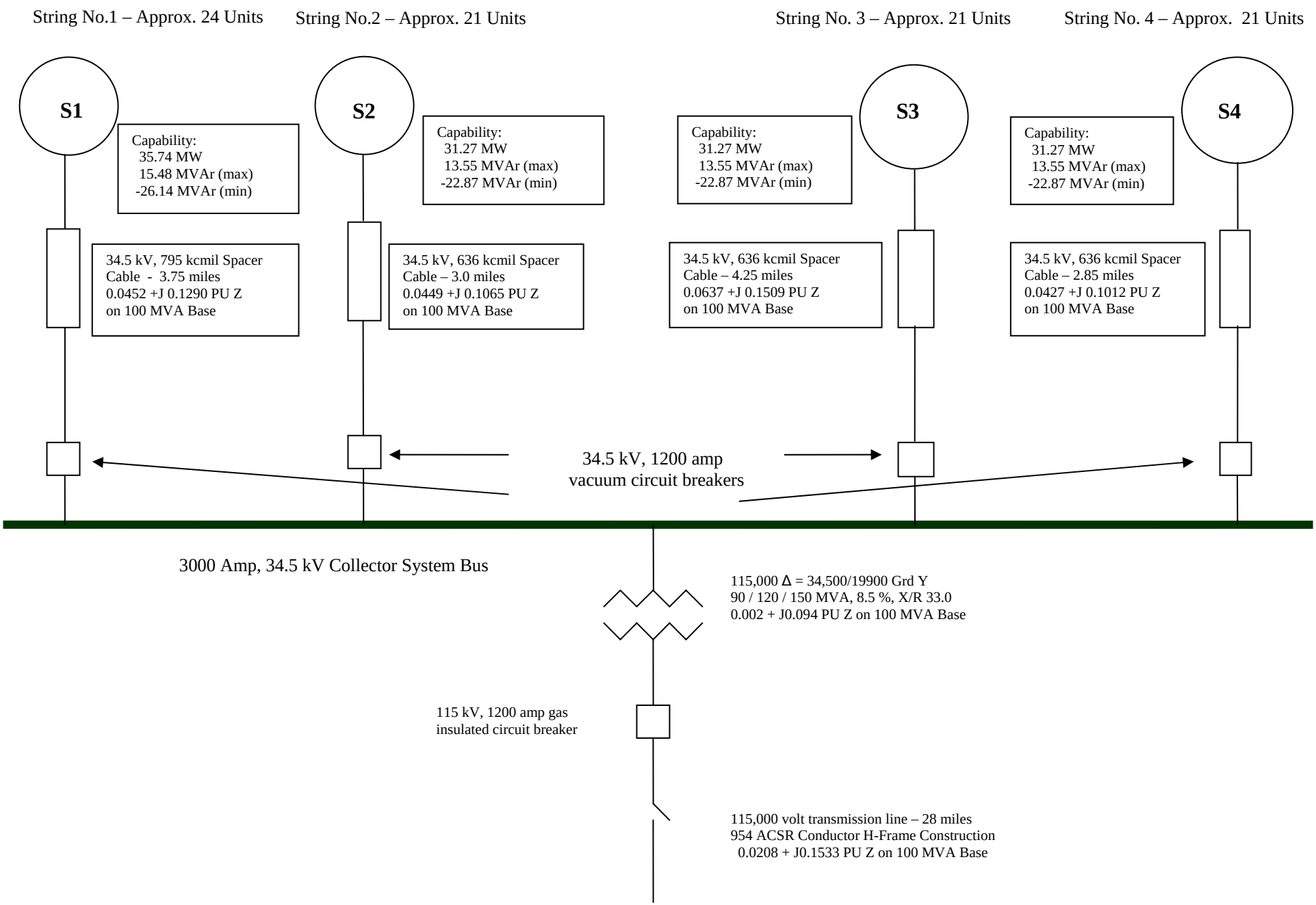
Outage Name	From Bus	From Name	From KV	To Bus	To Name	To KV	ID	Rating	Percentage of Emergency Rating: Baseline	Kibby on	Kibby on /20 MVAr @ Wym
Detroit Bus SB K	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	102.5	103.3	102.4
Line Sect 83	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	110.1	111.1	110.2
Sect 67 SB K67-1	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	102.5	103.3	102.4
Sect 83 SB K83-1	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	110.5	111.4	110.5
Sect 84 SB K84-1	70113	WYMAN	115	70115	WILLIAMS	115	1	171.8	104.0	104.6	104.0
Detroit Bus SB K	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	109.7	110.7	109.6
Line Sect 66	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	98.9	100.0	98.7
Line Sect 67-67A	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	101.2	101.7	101.1
Line Sect 83	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	117.5	118.6	117.6
Line Sect 84	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	104.6	105.3	104.5
Max SB KT3L-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	102.8	103.5	102.8
Max SB KT3L-2	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	106.0	106.7	106.0
Sect 67 SB K67-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	109.7	110.7	109.6
Sect 83 SB K83-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	117.9	119.0	117.9
Sect 84 SB K84-1	70115	WILLIAMS	115	70171	S 63B TP	115	1	171.8	111.3	111.9	111.2
Line Sect 83	70116	STURTVNT	115	70171	S 63B TP	115	1	171.8	102.0	103.1	102.0
Sect 83 SB K83-1	70116	STURTVNT	115	70171	S 63B TP	115	1	171.8	102.3	103.3	102.4

Color Key
flow > 100% - red
difference > adverse impact threshold (0) - gray

APPENDIX F – Kibby Project Equivalent One Line

APPENDIX F

KIBBY WIND POWER PROJECT
EQUIVALENT GENERATOR



APPENDIX G – Short-Circuit Analysis Results

Appendix G
Kibby Mountain Wind Farm
Feasibility Study
Short-circuit Results

Kibby Phase 1 Upgrades Only												
115kV Bus Fault Location	Device	Device Interruption Rating (Amperes*)	Pre-Kibby Project				Post-Kibby Project				Delta	
			Three-Phase		Single-Phase		Three-Phase		Single-Phase		Three-Phase	Single-Phase
			Amperes*	X/R	Amperes*	X/R	Amperes*	X/R	Amperes*	X/R	Amperes*	Amperes*
Redington			3,989.70	7.29990	1,684.80	3.28831	4,561.40	7.22102	2,411.30	3.62165	571.70	726.50
	not designed	n/a										
Bigelow			4,639.20	7.13865	2,113.20	3.36470	5,740.30	7.60639	3,474.10	3.96968	1,101.10	1,360.90
T1H	fuses	10,000	46%		21%		57%		35%			
Wyman Hydro			9,160.40	7.95022	8,546.50	6.83802	9,482.60	7.68340	8,947.70	6.55429	322.20	401.20
K222-1	breaker	40,000	23%		21%		24%		22%			
K63-1	breaker	17,000	54%		50%		56%		53%			
K66-1	breaker	17,000	54%		50%		56%		53%			
K83-5	breaker	40,000	23%		21%		24%		22%			
KG-1	breaker	40,000	23%		21%		24%		22%			
KG-2	breaker	20,000	46%		43%		47%		45%			
KG-3	breaker	20,000	46%		43%		47%		45%			
Athens			6,322.20	7.90547	5,332.90	6.35242	6,384.80	7.80632	5,375.00	6.26978	62.60	42.10
	not designed	n/a										
Detroit			6,540.80	6.95343	4,312.50	4.08165	6,560.50	6.92379	4,320.80	4.06949	19.70	8.30
KT1H	breaker	7,000	93%		62%		94%		62%			
K66-6	breaker	40,000	16%		11%		16%		11%			
K67-1	breaker	40,000	16%		11%		16%		11%			
K85-1	breaker	25,000	26%		17%		26%		17%			
K203-1	breaker	40,000	16%		11%		16%		11%			

* All Fault Current and Interrupting Values are expressed in terms of RMS Amperes Symmetrical

Appendix G
Kibby Mountain Wind Farm
Feasibility Study
Short-circuit Results

Kibby Phase 3 - Alternative D Upgrades												
115kV Bus Fault Location	Device	Device Interruption Rating (Amperes*)	Pre-Kibby Project				Post-Kibby Project				Delta	
			Three-Phase		Single-Phase		Three-Phase		Single-Phase		Three-Phase	Single-Phase
			Amperes*	X/R	Amperes*	X/R	Amperes*	X/R	Amperes*	X/R	Amperes*	Amperes*
Bigelow			4,639.20	7.13865	2,113.20	3.36472	7,081.80	10.23640	4,672.60	6.83096	2,442.60	2,559.40
T1H	fuses	10000										
Detroit			6,540.80	6.95343	4,312.40	4.08180	6,638.70	6.94431	4,346.50	4.06270	97.90	34.10
KT1H	breaker	7,000	93%		62%		95%		62%			
K66-6	breaker	40,000	16%		11%		17%		11%			
K67-1	breaker	40,000	16%		11%		17%		11%			
K85-1	breaker	25,000	26%		17%		27%		17%			
K203-1	breaker	40,000	16%		11%		17%		11%			
Guilford			2,319.20	6.18326	1,374.50	3.59065	2,330.00	6.18006	1,377.60	3.58552	10.80	3.10
KT2H	breaker	6,000	39%		23%		39%		23%			
Gulf Island			13,722.80	7.54903	8,578.80	3.55003	13,828.70	7.53491	8,623.80	3.54614	105.90	45.00
KT4H	breaker	43,000	32%		20%		32%		20%			
K61-1	breaker	17,000	81%		50%		81%		51%			
K64-1	breaker	43,000	32%		20%		32%		20%			
K200-1	breaker	43,000	32%		20%		32%		20%			
K201-1	breaker	43,000	32%		20%		32%		20%			
K212-1	breaker	17,000	81%		50%		81%		51%			
Kibby			n/a	n/a	n/a	n/a	3,770.70	9.86996	4,304.20	10.95460	n/a	n/a
	not designed	n/a										
Livermore Falls			10,027.30	8.52595	7,810.40	5.20127	11,180.30	8.69198	8,669.60	5.46416	1,153.00	859.20
T1H	fuses	**10,000**	**100%**		78%		**112%**		87%			
K63-2	breaker	25,000	40%		31%		45%		35%			
K89-1	breaker	25,000	40%		31%		45%		35%			
K200-4	breaker	25,000	40%		31%		45%		35%			
Kimball Road			9,902.40	7.05735	6,229.10	3.42947	9,929.40	7.04057	6,237.70	3.42561	27.00	8.60
K87-2	breaker	43,000	23%		14%		23%		15%			
K209-2	breaker	43,000	23%		14%		23%		15%			
K210-1	breaker	43,000	23%		14%		23%		15%			
K214-1	breaker	43,000	23%		14%		23%		15%			
K217-1	breaker	40,000	25%		16%		25%		16%			
Redington			3,989.70	7.29990	1,684.80	3.28832	5,155.30	7.86692	2,896.80	4.60250	1,165.60	1,212.00
	not designed	n/a										
Riley			12,060.80	11.41830	11,992.00	9.76598	12,597.80	11.26270	12,411.40	9.63056	537.00	419.40
KT1H	breaker	25,000	48%		48%		50%		50%			
K89-2	breaker	40,000	30%		30%		31%		31%			
K227-1	breaker	40,000	30%		30%		31%		31%			
K229-1	breaker	40,000	30%		30%		31%		31%			
K230-1	breaker	40,000	30%		30%		31%		31%			
Rumford			13,644.70	12.97490	13,588.00	9.44230	13,723.70	12.82840	13,642.10	9.38057	79.00	54.10
T2H	fuses	15,000	91%		91%		91%		91%			
T3H	fuses	15,000	91%		91%		91%		91%			
T4H	fuses	15,000	91%		91%		91%		91%			
K211-1	breaker	43,000	32%		32%		32%		32%			
K228-1	breaker	43,000	32%		32%		32%		32%			
K218-1	breaker	20,000	68%		68%		69%		68%			
Rumford IP			14,588.40	14.01690	15,627.40	12.74230	14,689.50	13.83180	15,707.60	12.62840	101.10	80.20
KT1H/KGBS	breaker	43,000	34%		36%		34%		37%			
KGBS/229	breaker	43,000	34%		36%		34%		37%			
K217/228	breaker	43,000	34%		36%		34%		37%			
K228/T1H	breaker	43,000	34%		36%		34%		37%			
K229/217	breaker	43,000	34%		36%		34%		37%			
Stratton			3,919.30	7.68796	1,742.40	3.40665	5,216.30	9.40671	3,109.50	5.24886	1,297.00	1,367.10
K215A-4	breaker	20,000	20%		9%		26%		16%			
Wyman Hydro			9,160.40	7.95021	8,546.50	6.83820	11,128.40	8.78826	10,194.40	7.18377	1,968.00	1,647.90
K222-1	breaker	40,000	23%		21%		28%		25%			
K63-1	breaker	17,000	54%		50%		65%		60%			
K66-1	breaker	17,000	54%		50%		65%		60%			
K83-5	breaker	40,000	23%		21%		28%		25%			
KG1	breaker	40,000	23%		21%		28%		25%			
KG2	breaker	20,000	46%		43%		56%		51%			
KG3	breaker	20,000	46%		43%		56%		51%			
Woodstock			6,722.00	7.20512	4,898.10	4.04027	6,738.10	7.18291	4,904.20	4.03456	16.10	6.10
KT1H	breaker	**6,000**	**112%**		82%		**112%**		82%			
Winslow			6,303.90	5.33511	3,524.00	3.12034	6,354.00	5.29579	3,542.90	3.10269	50.10	18.90
K83-1	breaker	40,000	16%		9%		16%		9%			
K84-1	breaker	40,000	16%		9%		16%		9%			
KT1H	breaker	7,000	90%		50%		91%		51%			
KT2H	breaker	7,000	90%		50%		91%		51%			
KT3H	breaker	7,000	90%		50%		91%		51%			

* All Fault Current and Interrupting Values are expressed in terms of RMS Amperes Symmetrical

Appendix G
Kibby Mountain Wind Farm
Feasibility Study
Short-circuit Results

Kibby Phase 3 - Alternative E Upgrades												
115kV Bus Fault Location	Device	Device Interruption Rating (Amperes*)	Pre-Kibby Project				Post-Kibby Project				Delta	
			Three-Phase		Single-Phase		Three-Phase		Single-Phase		Three-Phase	Single-Phase
			Amperes*	X/R	Amperes*	X/R	Amperes*	X/R	Amperes*	X/R	Amperes*	Amperes*
Bigelow			4,639.20	7.13865	2,113.20	3.36472	7,601.30	9.50885	5,004.50	6.82907	2,962.10	2,891.30
T1H	fuses	10000	46%		21%		76%		50%			
Detroit			6,540.80	6.95343	4,312.40	4.08180	6,601.00	6.95451	4,333.90	4.07004	60.20	21.50
KT1H	breaker	7,000	93%		62%		94%		62%			
K66-6	breaker	40,000	16%		11%		17%		11%			
K67-1	breaker	40,000	16%		11%		17%		11%			
K85-1	breaker	25,000	26%		17%		26%		17%			
K203-1	breaker	40,000	16%		11%		17%		11%			
Guilford			2,319.20	6.18326	1,374.50	3.59065	2,325.80	6.18295	1,376.50	3.58744	6.60	2.00
KT2H	breaker	6,000	39%		23%		39%		23%			
Gulf Island			13,722.80	7.54903	8,578.80	3.55003	13,749.00	7.53418	8,586.00	3.54676	26.20	7.20
KT4H	breaker	43,000	32%		20%		32%		20%			
K61-1	breaker	17,000	81%		50%		81%		51%			
K64-1	breaker	43,000	32%		20%		32%		20%			
K200-1	breaker	43,000	32%		20%		32%		20%			
K201-1	breaker	43,000	32%		20%		32%		20%			
K212-1	breaker	17,000	81%		50%		81%		51%			
Kibby			n/a	n/a	n/a	n/a	3,776.40	9.75378	4,310.00	10.79930	n/a	n/a
	not designed	n/a										
Livermore Falls			10,027.30	8.52595	7,810.40	5.20127	10,063.90	8.49890	7,826.90	5.19045	36.60	16.50
T1H	fuses	**10,000**	**100%**		78%		**101%**		78%			
K63-2	breaker	25,000	40%		31%		40%		31%			
K89-1	breaker	25,000	40%		31%		40%		31%			
K200-4	breaker	25,000	40%		31%		40%		31%			
Kimball Road			9,902.40	7.05735	6,229.10	3.42947	10,012.00	7.01462	6260.6	3.41444	109.60	31.50
K87-2	breaker	43,000	23%		14%		23%		15%			
K209-2	breaker	43,000	23%		14%		23%		15%			
K210-1	breaker	43,000	23%		14%		23%		15%			
K214-1	breaker	43,000	23%		14%		23%		15%			
K217-1	breaker	40,000	25%		16%		25%		16%			
Redington			3,989.70	7.29990	1,684.80	3.28832	5,355.30	7.44961	3,006.50	4.54465	1,365.60	1,321.70
	not designed	n/a										
Riley			12,060.80	11.41830	11,992.00	9.76598	12,152.30	11.27650	12,054.60	9.69049	91.50	62.60
KT1H	breaker	25,000	48%		48%		49%		48%			
K89-2	breaker	40,000	30%		30%		30%		30%			
K227-1	breaker	40,000	30%		30%		30%		30%			
K229-1	breaker	40,000	30%		30%		30%		30%			
K230-1	breaker	40,000	30%		30%		30%		30%			
Rumford			13,644.70	12.97490	13,588.00	9.44230	14,868.90	12.64070	14,571.70	9.29166	1,224.20	983.70
T2H	fuses	15,000	91%		91%		99%		97%			
T3H	fuses	15,000	91%		91%		99%		97%			
T4H	fuses	15,000	91%		91%		99%		97%			
K211-1	breaker	43,000	32%		32%		35%		34%			
K228-1	breaker	43,000	32%		32%		35%		34%			
K218-1	breaker	20,000	68%		68%		74%		73%			
Rumford IP			14,588.40	14.01690	15,627.40	12.74230	15,631.00	13.50520	16,519.70	12.36780	1,042.60	892.30
KT1H/KGBS	breaker	43,000	34%		36%		36%		38%			
KGBS/229	breaker	43,000	34%		36%		36%		38%			
K217/228	breaker	43,000	34%		36%		36%		38%			
K228/T1H	breaker	43,000	34%		36%		36%		38%			
K229/217	breaker	43,000	34%		36%		36%		38%			
Stratton			3,919.30	7.68796	1,742.40	3.40665	7,129.50	9.74575	4,749.90	6.15245	3,210.20	3,007.50
K215A-4	breaker	20,000	20%		9%		36%		24%			
Wyman Hydro			9,160.40	7.95021	8,546.50	6.83820	10,242.80	8.52560	9,507.10	7.04413	1,082.40	960.60
K222-1	breaker	40,000	23%		21%		26%		24%			
K63-1	breaker	17,000	54%		50%		60%		56%			
K66-1	breaker	17,000	54%		50%		60%		56%			
K83-5	breaker	40,000	23%		21%		26%		24%			
KG1	breaker	40,000	23%		21%		26%		24%			
KG2	breaker	20,000	46%		43%		51%		48%			
KG3	breaker	20,000	46%		43%		51%		48%			
Woodstock			6,722.00	7.20512	4,898.10	4.04027	6,883.80	7.10953	4,963.10	3.99802	161.80	65.00
KT1H	breaker	**6,000**	**112%**		82%		**115%**		83%			
Winslow			6,303.90	5.33511	3,524.00	3.12034	6,335.80	5.31243	3,536.60	3.10835	50.10	18.90
K83-1	breaker	40,000	16%		9%		16%		9%			
K84-1	breaker	40,000	16%		9%		16%		9%			
KT1H	breaker	7,000	90%		50%		91%		51%			
KT2H	breaker	7,000	90%		50%		91%		51%			
KT3H	breaker	7,000	90%		50%		91%		51%			

* All Fault Current and Interrupting Values are expressed in terms of RMS Amperes Symmetrical