

**NPCC  
2015 MARITIMES AREA  
INTERIM REVIEW OF RESOURCE ADEQUACY**



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NORTHERN MAINE ISA, INC.**

**Approved by the RCC  
September 10, 2015**

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## 1.0 EXECUTIVE SUMMARY

The 2015 Maritimes Area Interim Review of Resource Adequacy (2015 Interim Review), covering the period of January 2016 through December 2018, has been prepared to satisfy the Reliability Assessment Program as established by the Northeast Power Coordinating Council (NPCC). This 2015 Interim Review follows the resource adequacy review guidelines as specified in the *NPCC Regional Reliability Directory #1 Appendix D (Adopted: December 1, 2009)*.

The Maritimes Area will comply with the NPCC resource adequacy criterion that requires a loss of load expectation (LOLE) value of not more than 0.1 days/year for all years of this 2015 Interim Review. A summary of LOLE values for each year of the 2015 Interim Review and the 2013 Maritimes Area Comprehensive Review of Resource Adequacy (2013 Comprehensive Review) is shown in Table 1 below.

**Table 1 – Maritimes Area LOLE Values from 2015 to 2018**

Year	2015 Interim Review (days/year)	2013 Comprehensive Review (days/year)
2016	0.003	0.007
2017	0.004	0.006
2018	0.002	0.005

Area load and capacity projections from 2016 to 2018 for this 2015 Interim Review are little changed from those projected for the 2013 Comprehensive Review and as a result, the LOLE values are practically the same. LOLE results for the 2015 Interim Review are all marginally lower than the 2013 Comprehensive Review.

There are no changes in this 2015 Interim Review with respect to fuel supplies, transfer capabilities, emergency operating procedures, or market rules.

## 2.0 INTRODUCTION

This 2015 Interim Review is the second update of the 2013 Comprehensive Review approved by the Reliability Coordinating Committee (RCC) on December 3, 2013. The Maritimes Area is a winter peaking area with separate jurisdictions in New Brunswick, Nova Scotia, Prince Edward Island, and Northern Maine. New Brunswick Power Corporation is the Reliability Coordinator for the Maritimes Area, with its system operator functions performed by its Transmission and System Operator division under a regulator approved Standards of Conduct.

### 3.0 ASSUMPTION CHANGES

No changes were made in this 2015 Interim Review with respect to fuel supplies, transfer capabilities, emergency operating procedures, or market rules.

#### 3.1 Demand Forecast

The Maritimes Area coincident peak demand is forecast to occur during the month of January each year. Table 2 shows a comparison of the annual peak loads used in this 2015 Interim Review versus the 2013 Comprehensive Review.

**Table 2 – Maritimes Area Peak Demand Forecast from 2016 to 2018**

Year	2015 Interim Review (MW)	2013 Comprehensive Review (MW)	Difference (MW)
2016	5,237	5,267	-30
2017	5,251	5,267	-16
2018	5,265	5,253	12
2016 to 2018 Compound Annual Growth Rate			
Growth Rate	0.3%	-0.1%	

Forecast peak demand in the Maritimes Area is effectively flat over the period of this 2015 Interim Review and practically unchanged from the 2013 Comprehensive Review.

#### 3.2 Resources Forecast

Resource changes for this 2015 Interim Review versus the 2013 Comprehensive Review include the following:

- Reductions of between 50 MW and 77 MW of Nova Scotia's on peak wind capacity due to removal of Energy Resource Interconnection Service connected wind generation from the capacity calculation. This generation capacity is considered unavailable due to capacity limits on the transmission system.
- A correction from 11 MW to 2 MW was made to a Nova Scotia hydro unit's modeled capacity.
- Partial availabilities modeled for Nova Scotia combined cycle maintenance modes.
- Installation of a 10 MW of Nova Scotia biomass generator in 2017 is now included in the resource mix.
- An existing biomass unit, presently an Energy Resource Interconnection Service resource, is planned to be converted to Network Resource Interconnection Service in 2018. It is assumed the unit will be available for 45 MW of net firm capacity.

- A 37 MW biomass plant in Northern Maine mothballed for the 2013 Comprehensive Review has now returned to service.

Table 3 shows the year by year January resources forecast for this 2015 Interim Review compared to the 2013 Comprehensive Review.

**Table 3 – Maritimes Area Resources Forecast for 2016 to 2018**

Year	2015 Interim Review (MW, with on-peak wind)			2013 Comprehensive Review (MW, with on-peak wind)			Difference (MW)
	Conventional	Wind	Total	Conventional	Wind	Total	Total
2016	6,892	482	7,374	6,858	532	7,390	-16
2017	6,902	482	7,384	6,858	545	7,403	-19
2018	6,947	482	7,429	6,858	559	7,417	12

Conventional capacity in Table 3 is from the peak load month of January of each year and includes installed generation, contracted inter-area purchases (if any), and tie benefits of 300 MW (see Section 3.5 below). Wind capacity used in Table 3 is the total amount of wind generation modeled during the hour of the Maritimes Area coincident peak load. Forecast hourly wind generation capacity is netted against hourly loads for LOLE analysis.

### 3.3 Comparison of Forecast and Required Reserve

The Maritimes Area uses a 20% reserve criterion for planning purposes. This criterion is not mandated but has historically resulted in levels of reserve that are closely correlated to the reserve levels necessary to meet the NPCC resource adequacy criterion. A close correlation between this 20% reserve criterion and NPCC’s LOLE criterion of not more than 0.1 days per year of load losses due to resource deficiencies was established in the 2013 Comprehensive Review. Table 4 shows annual values for the forecast, minimum and required reserves at 20%. In each year of this 2015 Interim Review, the forecast reserve exceeds the 20% required reserve criterion.

**Table 4 – Forecast, Minimum and Required Reserve - January 2016 to 2018**

Year	Forecast Capacity (MW)	Peak Load (MW)	Inter. Load (MW)	Forecast Reserve		Minimum Reserve		Required Reserve	
				MW	%	MW	%	MW	%
2016	7,374	5,237	252	2,389	48	1,455	41	997	20
2017	7,384	5,251	252	2,385	48	2,279	47	1,000	20
2018	7,429	5,265	252	2,416	48	2,274	48	1,003	20

$$\text{Forecast Reserve (\%)} = \frac{[\text{Forecast Capacity} - (\text{Peak Load} - \text{Inter. Load})]}{(\text{Peak Load} - \text{Inter. Load})} * 100\%$$

$$\text{Min. Reserve (\%)} = \frac{[\text{Min. of Hourly (Capacity - (Load - Inter. Load))}] * 100\%}{(\text{Peak Load} - \text{Inter. Load})}$$

Forecast wind generation outputs during the Maritimes Area peak load hour are used for the forecast capacity totals in Table 4. Hour by hour reserve values are used for the minimum reserve calculations.

### 3.4 Interconnection Tie Benefits

In this 2015 Interim Review, 300 MW of interconnection tie benefits from New England are assumed. These tie benefits are based on a 2011 decision by the New Brunswick Market Advisory Committee to recognize the lowest historical Firm Transmission Capacity posted from summer peaking New England to winter peaking New Brunswick since the commissioning of the second 345 kV tie between these systems in December 2007. This is unchanged from the 2013 Comprehensive Review. In the CP-8 report *Review of Interconnection Assistance Reliability Benefits (June 1, 2011)* the range of estimated annual tie benefit potential for the Maritimes Area for 2015 was 1,252 – 1,536 MW. Based on this CP-8 report, the 300 MW of tie benefits assumed is conservative.

### 3.5 Interface Limits

For the purposes of this 2015 Interim Review, interconnection support from neighbouring NPCC Areas was limited to 300 MW of tie benefits for all years. In addition, beginning in late 2017, 153 MW of firm contracted capacity is expected to be available from a new 500 MW Maritimes Area HVDC link with Newfoundland and Labrador. Non-firm capacity from Newfoundland and Labrador was not modeled.

## 4.0 FUEL SUPPLIES

The 2013 Comprehensive Review showed that the Maritimes Area has a diversified mix of resources such that there is not a high degree of reliance upon any one type or source of fuel. This diversified resource mix is unchanged for this 2015 Interim Review.

Generation fueled only by natural gas accounts for just 7% of Maritimes Area capacity resources with supply options that include local shale gas fields, eastern off-shore production, western pipelines, and a liquefied natural gas receiving and re-gasification terminal. These supply options help to significantly reduce the exposure of the Maritimes Area to natural gas fuel disruptions.

## 5.0 LOLE RESULTS

Area load and capacity projections from 2016 to 2018 for this 2015 Maritimes Area Interim Review of Resource Adequacy are little changed from those predicted for the 2013 Comprehensive Review and as a result, the LOLE values are practically the same.

A summary of the Maritimes Area LOLE values from 2016 to 2018 is shown in Table 5 below. All LOLE values for this 2015 Interim Review meet the NPCC resource adequacy criterion.

**Table 5 – Maritimes Area LOLE Values from 2015 to 2018**

Year	2015 Interim Review (days/year)	2013 Comprehensive Review (days/year)
2016	0.003	0.007
2017	0.004	0.006
2018	0.002	0.005

In the 2013 Comprehensive Review, the Maritimes Area examined a high growth scenario based on adding a fixed value of 1% compounding growth to the average annual growth rate examined during the period. As a check on this scenario for this 2015 Interim Review, a compounding load growth rate of 1.3% per year was added uniformly across all sub-areas to the two future years of the forecast period. The LOLE values obtained for the future years of 2017 and 2018 were 0.006 and 0.004 respectively, both still meeting the NPCC resource adequacy criterion.

## 6.0 CONCLUSION

Results of this 2015 Interim Review show the Maritimes Area will comply with the NPCC resource adequacy criterion requiring a LOLE value of not more than 0.1 days/year for all years from 2016 to 2018.