



# Characteristics of Proxy Units

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RESOURCE ADEQUACY



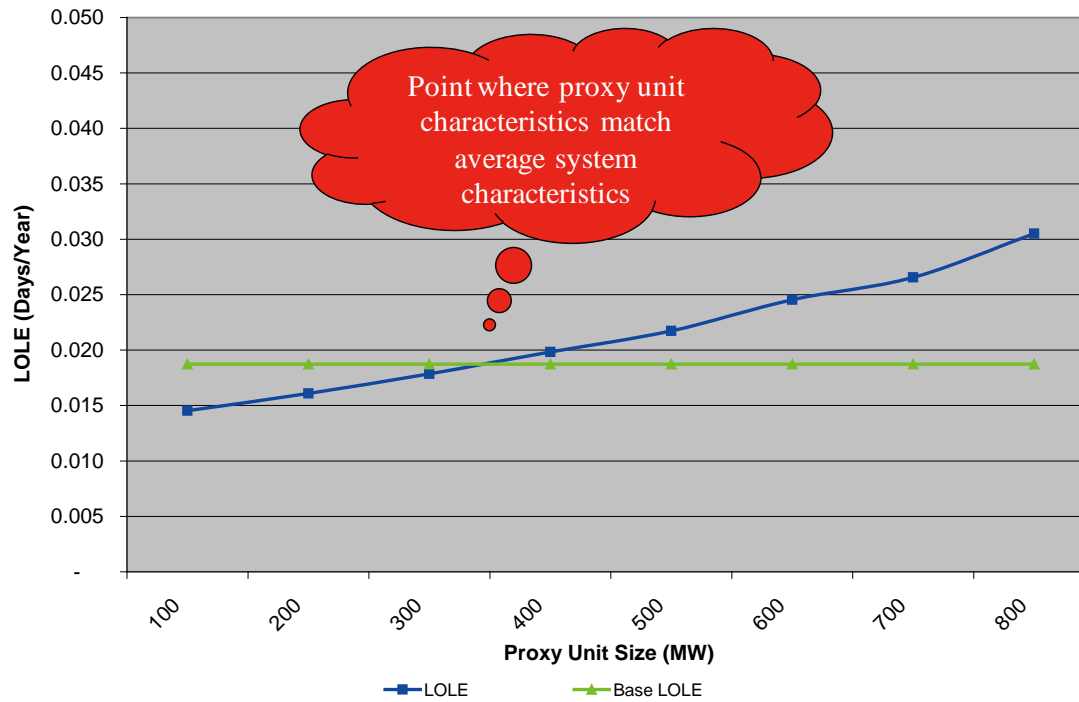
# Background

Market Rule 12.7.1 states that: “When the available resources are insufficient for the unconstrained New England Control Area to meet the resource adequacy planning criterion specified in Section III.12.1, proxy units shall be used as additional capacity to determine the Installed Capacity Requirement and the Local Resource Adequacy Requirements. The proxy units shall reflect resource capacity and outage characteristics such that when the proxy units are used in place of all other resources in the New England Control Area, the reliability, or LOLE, of the New England Control Area does not change. The outage characteristics are the summer capacity weighted average availability of the resources in the New England Control Area as determined in accordance with Section III.12.7.3. The capacity of the proxy unit is determined by adjusting the capacity of the proxy unit until the LOLE of the New England Control Area is equal to the LOLE calculated while using the capacity assumptions described in Section III.12.7.2. “

## Background (cont.)

- Given recent Non-Price Retirement requests and the need to calculate the capacity requirement values for the LOLE probability points corresponding to the System-wide Capacity Demand Curve, it is likely that proxy units will be used in LOLE calculations moving forward.
- Proxy unit characteristics were last reviewed in 2006. See: [http://www.iso-ne.com/committees/comm\\_wkgrps/othr/icsp/mtrls/2006/apr132006/expansion\\_units.pdf](http://www.iso-ne.com/committees/comm_wkgrps/othr/icsp/mtrls/2006/apr132006/expansion_units.pdf).
- This presentation covers the recent ISO review whether the current proxy unit characteristics are still appropriate for ICR and related calculations.

# Current Proxy Unit Characteristics – 2006 Study



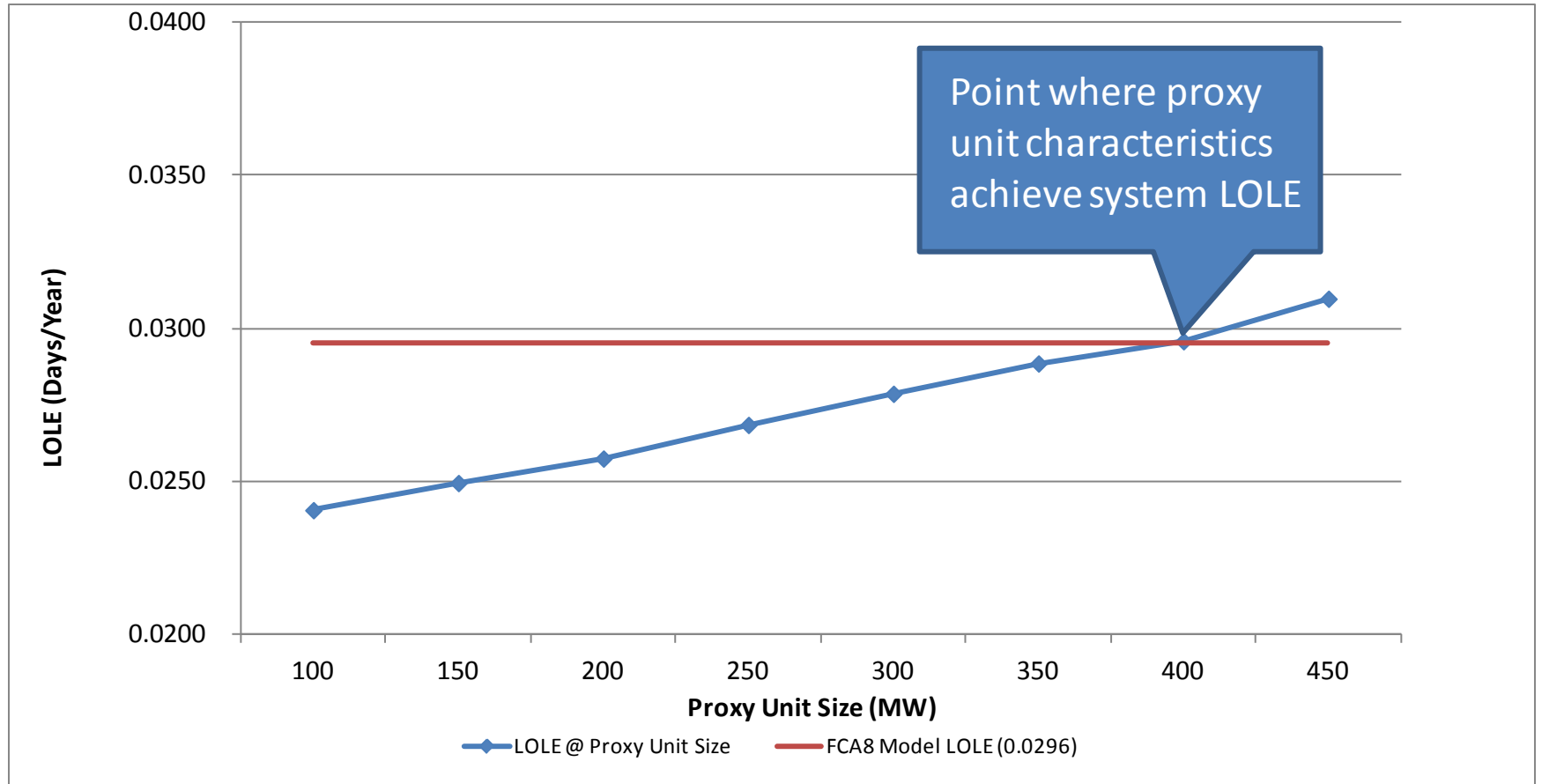
- Current proxy units have an EFORd of 5.54% and 5 weeks of maintenance
- From slide 7 of the April 13, 2006 presentation on proxy unit characteristics

# 2014 Proxy Unit Study Methodology

- Proxy unit characteristics are determined using the average system availability and a series of LOLE calculations. Replacing all system capacity with proxy units should leave system LOLE and resulting capacity requirement unchanged.
- The latest available load and resource assumptions for calculating the 2017/18 Forward Capacity Auction Installed Capacity Requirement (FCA8 ICR Model) was used for the study
- Procedure:
  - Determine the initial LOLE of the system using the FCA8 ICR Model
  - Determine the average availability of the system for both forced and scheduled outages (5.47% Forced Outage Rate (FOR) and 4 weeks of maintenance)
  - Replace all resources in the system with proxy units with the average system availability
  - Adjust the capacity ratings of the proxy units within the model until the initial system LOLE is achieved



# Proxy Unit Model Runs Using the 2017/18 FCA8 ICR Model



# Consideration of Proxy Unit Scenarios

- The previous slide shows the proxy unit characteristics consistent with the FCA8 ICR model should be 400 MW with 5.47% EFORd and 4 weeks of maintenance
- However, recent changes in generator EFORd and demand resource performance along with retirements of current resources could lead to changes in average system resource availability characteristics in future ICR models
- ISO-NE has looked at various forced outage rate scenarios in the proxy unit characteristic studies
  - Decreasing and increasing the 5.47% system FOR to determine the corresponding proxy unit size in MW

# FOR Scenarios

- The table shows that there are many possible combinations of FOR and proxy unit size that would be neutral to the ICR calculations
- All scenarios use 4 weeks of maintenance

Proxy Unit Size (MW)	Average Resource FOR						
	4.92%	5.20%	5.47%	5.69%	5.80%	5.91%	6.02%
100							0.0294
150						0.0296	
200					0.0295		
250							
300				0.0299			
350							
400			0.0296				
450							
500		0.0301					
550							
600							
650	0.0295						



# Scenario Evaluating Retirements of FCA8 Generators

- Approximately 1,850 MW of FCA8 generating resources submitted Non-price Retirements (NPRs)
- Removing those resources from the ICR model reduces the system FOR to 5.39% while the maintenance requirement remains unchanged at 4 weeks
- As shown in the table below, using the 400 MW proxy unit with 5.47% EFORd and 4 weeks of maintenance would still be a valid assumption

	FOR	MTN	Proxy Unit Size (MW)	LOLE (days/year)	Difference in ICR from #1
1. FCA8 Model - 1,850 MW NPRs	by unit	by unit	by unit	0.1103	-
2. FCA8 Model - 1,850 MW NPRs replaced by proxy units	5.47%	4 wk	350	0.1096	-55
3. FCA8 Model - 1,850 MW NPRs replaced by proxy units	5.47%	4 wk	400	0.1140	-35
4. FCA8 Model - 1,850 MW NPRs replaced by proxy units	5.47%	4 wk	450	0.1170	77

# Comparison of LOLE

- The current (2006 Study) proxy unit characteristics:
  - Proxy unit size = 350 MW
  - EFORd of proxy unit = 5.54%
  - Maintenance requirement = 5 weeks
- LOLE comparison of current versus proposed proxy unit characteristics produces a difference in LOLE of 0.0003 which translates to a 17 MW difference in ICR

Scenario	FOR (%)	MTN Wk	Size (MW)	LOLE
FCA8 ICR Model	By unit	By unit	By unit	0.0296
Current Proxy Units – 2006 Study	5.54	5	350	0.0299
Proposed Proxy Units – 2014 Study	5.47	4	400	0.0296

# Conclusions

- Many different combinations of proxy unit size and EFORd could be considered as an acceptable assumption for use in calculating ICR
- The 1,850 MW of NPRs from FCA8 do not effect the system availability statistics very much, and therefore the proxy unit size
- Even though the updated proxy unit size and characteristics have a very minor effect on ICR, ISO is recommending that the proxy unit characteristics be updated to the 2014 Study values

# ISO Recommendations

- Recommend updating the proxy unit characteristics based on the FCA8 ICR Model base case as follow:
  - Proxy unit size equal to 400 MW
  - EFORd of proxy unit = 5.47%
  - Maintenance requirement = 4 weeks
- Periodically review proxy unit characteristics and revise, if necessary

# Questions

