

Maintaining Reliability Under Extreme Conditions

Understanding ISO New England’s Operational Fuel Security Analysis

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On March 28, 2018, ISO New England (ISO) released an update of its Operational Fuel Security Analysis (OFSA) with stakeholder-request scenarios included. The study lays out many different possibilities for a 2024/25 winter, assessing the electric grid’s reliability under a varying array of assumptions. The updated results reinforce the key takeaway from the ISO’s January 2018 draft analysis: reliable electric service, with no rolling blackouts, is possible and likely even under an extreme weather scenario, as long as states continue to implement current policies.

Before receiving input from regional stakeholders, the ISO model produced results that showed significant reliability issues in an extreme winter for 2024/25. Recognizing unreasonable assumptions in the scenarios modeled, 14 New England Power Pool (NEPOOL) stakeholders submitted a joint request for a new Reference case called “Business-as-Usual” (BAU). The ISO subsequently modeled the BAU scenario, with more reasonable future load and resource assumptions, and the results showed **no operational issues and no instances of rolling blackouts**.

The ISO describes its analysis as an evaluation of fuel security risks during extreme winter weather and suggests that the most significant component of that fuel risk is the inadequacy of the natural gas delivery infrastructure. However, a close reading of all the ISO model results shows that no new gas infrastructure is needed to maintain a reliable grid in 2024/25.

The BAU case models:

- All six states meeting their **renewable portfolio standards**;
- Completion by 2024 of MA legislated **1,000 MW of clean energy imports**;
- Actual current availability of LNG imports at **1.25 Bcf/day** as noted by NEPOOL stakeholders.

Correcting the ISO’s overly conservative assumptions (BAU scenario) shows few operational issues and no reliability threats (reserve depletions or rolling blackouts) for an extreme winter in 2024/25. Further stakeholder scenarios show numerous ways to further reduce or eliminate operational and reliability concerns, as compared to the ISO’s scenarios.

Figure 1. Reference and high retirement cases: ISO compared to stakeholder scenarios

Metric	Ret cap	LNG cap	Dual -Fuel	Imports	RE cap	LNG capacity stressed	Electric capacity deficiency events		Reserve deficiencies	Emergency electric load shedding	
						LNG >95% Assumed Cap	All OP 4	Actions 6-11	10-Min Reserve Depletion	OP 7 Action: Load Shedding	
Unit	MW	Bcf/Day	Oil Tank fills	MW	MW	Days	Hours	Hours	Hours	Hours	Days
ISO Reference	-1,500	1.00	2	2,500	6,600	35	165	76	53	14	6
JR #1: BAU	-1,500	1.25	2	3,500	7,900	13	0	0	0	0	0
ISO 10: More retirements	-4,500	1.00	2	2,500	6,600	-	455	316	258	105	16
JR #15: BAU + Max Retirements	-5,400	1.25	2	3,500	7,900	13	0	0	0	0	0

What do the different results mean for fuel security in New England?

The ISO Reference case and the Joint Requester BAU case produce widely variant results. The ISO Reference case purports that the region's electric and natural gas infrastructure will be significantly stressed under extreme winter conditions in 2024/2025. The Joint Requester BAU case, on the other hand, shows no significant fuel reliability concerns, even under higher levels of unit retirements.

Category	ISO Reference case	Joint Requester BAU
RE targets	ISO does not assume compliance with state renewable targets	Nearly 8 GW of RE capacity to comply with state RPS targets
Canadian Imports	No increase in imports from Canada	New imports of 1,000 MW by 2022 as required by MA law
Non-electric gas	ISO assumes non-electric gas demand will increase by 1.26 percent per year	Assume historical rate of growth of 0.7 percent per year
Electric EE	2017 CELT forecast	2018 CELT forecast
Oil refills	2 oil tank refills	2 oil tank refills
Retired capacity	1,500 MW of thermal units	1,500 MW of thermal units
LNG deliveries	1.00 bcf/day	1.25 bcf/day, as observed in Feb. 2016
New technologies	No demand response or battery energy storage	DR and storage are already deployed and more is likely by 2024

Given that it does not model compliance with current on-the-books policies in the region, **the ISO Reference case is an inaccurate and inadequate base case.** And the difference between the two sets of results is striking. The ISO's Reference case suggests that the region requires expensive new gas infrastructure to maintain reliability. The Joint Requester BAU case, with a few modeling inputs adjusted, suggests that simply completing existing infrastructure plans resolves most issues and avoids uneconomic expenditures on pipelines.

What about Mystic?

On March 29, 2018, Exelon announced its decision to retire the Mystic Generating Station's natural gas and jet fuel-fired units. Recently, the ISO has discussed measures that would pay Exelon to keep 1,600 megawatts of Boston-local capacity online. Any decision about a cost of service agreement should be based upon a probabilistic assessment of future conditions, *not* upon worst case winter scenarios, such as those outlined in the OFSA.

How to use the OFSA results

New England states already have robust goals for the deployment of clean energy technologies, energy efficiency, and battery energy storage. Now they must act to comply with those policies. If and when they do, the unreliable fuel security future forecasted by the ISO will be comfortably averted, even under extreme weather conditions in future winters.

Going forward, any changes in market designs or new programs intended to address the OFSA need to be developed with input from all stakeholders and take into account all the scenarios requested. Relying solely on the ISO's worst-case scenarios could result in unnecessary costs for the region's electric ratepayers.

ABOUT SYNAPSE

Synapse Energy Economics, Inc. is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power sector for public interest and governmental clients.

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