UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc.,	**)**	**Docket Nos. EL18-182-000**
	)	**ER20-1567-000**

MOTION TO INTERVENE AND COMMENTS OF THE ISO-NEW ENGLAND EXTERNAL MARKET MONITOR

Pursuant to Rules 212 and 214 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission ("FERC" or "Commission"), 18 C.F.R. §§ 385.212 and 214 (2007), Potomac Economics respectfully moves to intervene in the above-captioned proceeding concerning the ISO-New England's ("ISO-NE") April 15, 2020 filing in this proceeding in compliance with a Commission Order requiring it to submit market design changes to address fuel security concerns confronting the region. The ISO's April 15 compliance filing proposes market design changes that would address the concerns by incorporating a comprehensive set of reserve markets into its existing day-ahead market. The compliance filing includes two proposals: the "ISO Proposal" and a slight variant that was supported by a super-majority of NEPOOL participants ("the NEPOOL Proposal").

Potomac Economics is the External Market Monitor ("EMM") for ISO-NE. The EMM is responsible for evaluating market performance and recommending design changes to the ISO-NE markets. These comments explain our reasons for generally supporting the proposed changes.

With respect to the differences between the ISO Proposal and the NEPOOL Proposal, these comments provide our preferred solution.

I. NOTICE AND COMMUNICATIONS

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II. INTRODUCTION AND SUMMARY OF COMMENTS

ISO New England has proposed to implement day-ahead ancillary services markets as a comprehensive solution to the market deficiencies that originally led to the Energy Security Initiative. We generally support the ISO's proposal to define technology-neutral products that will allow all types of energy-secure resources to be compensated for providing reserves within a competitive market framework. We have long recommended the ISO implement day-ahead ancillary services markets to provide a mechanism for the ISO to procure sufficient resources to maintain reserve adequacy rather than making out-of-market supplemental commitments. Out-of-market commitments tend to depress prices and undermine incentives for generators to be available, operate reliably, and invest in secure fuel supply.

The ISO is required to ensure that it has a reliable day-ahead operating plan, that is sufficient resources to satisfy forecasted demand and to respond to certain contingencies and unexpected events.[1] Most of these requirements are satisfied by generators and importers scheduled in the day-ahead energy market, fast-start generators not economic to provide energy,

[1] See Attachment A to the April 15 Filing, *Testimony of Peter T. Brandien*, pages 10-12.

and by suppliers complying with their forward reserve market obligations for 10-minute and 30-minute operating reserves. However, in recent years, we have observed frequent (~4,000 hours per year) supplemental commitments in the day-ahead market commitment software to satisfy 10-minute spinning reserve requirements, which are not procured through the day-ahead market.[2] These non-market commitments depress prices and undermine incentives for investment in flexible generation.

New England's replacement reserve requirements have generally been satisfied in recent years by latent reserves. These are reserves that are available in the operating day, even though there is no market requirement or out-of-market action that causes them to be available. This includes quick start units that are not scheduled for reserves, but which nevertheless are offering to supply energy on short notice. When sufficient latent reserves are not available to satisfy the 90-minute and 240-minute criteria, the ISO makes supplemental commitments to make additional resources available after the day-ahead market.

The ISO's Proposal has taken the proper approach to fuel security reliability concerns by focusing on the underlying product being sought, which ultimately is the capability to provide energy on demand. Previous narrowly tailored solutions like the Winter Reliability Program and the out-of-market contract to retain the Mystic units maintain reliability by compensating the subset of the resources that might otherwise not perform reliably during winter conditions. Such discriminatory measures are inefficient because they leave uncompensated many resources that provide an equivalent service. Consequently, they cannot provide efficient long-term signals that would motivate investment in energy secure resources. Furthermore, the efficient set of operating reserve providers is constantly changing from day to day and hour to hour according to system

[2] See *2018 Assessment of the ISO New England Electricity Markets by Potomac Economics*, Section III.D.

conditions, so it is efficient to integrate these reserve requirements into the day-ahead market which can co-optimize the procurement of energy and operating reserves.

Many elements of the ISO Proposal have been implemented in other markets, but one novel element is the call option-style reserve product as opposed to the more commonly used forward-style ancillary service contract. Most other RTO regions with day-ahead ancillary services markets (NYISO, MISO, CAISO, and SPP) have defined each product as a day-ahead forward contract that settles at the real-time clearing price for the same reserve product. ISO New England has proposed a new type of day-ahead contract that would settle as a call option for energy with a strike price equal to the expected value of the real-time LMP. The option style contract has some desirable features, including that it would: (a) provide stronger incentives in some circumstances for generators to be available when needed for reliability; and (b) allocate reserves to resources that would be most economic to provide energy if needed in real-time.

The ISO has submitted two proposals, one that it prefers ("ISO Proposal") and one that a super-majority of NEPOOL participants voted for ("NEPOOL Proposal"). The proposals differ with respect to implementation of replacement reserves and the level of the strike price. The ISO Proposal would use the RER90 and RER240 requirements in all months sufficient to satisfy the NPCC criteria to restore 10-minute and 30-minute reserves the system following the largest contingency within 90 minutes and 240 minutes respectively, plus a margin to account for load forecast error. The NEPOOL proposal would instead implement these requirements during the winter months of December through February, and it would eliminate the additional reserve procurement for load forecast error. We support the ISO Proposal regarding the treatment of replacement reserves for reasons which are discussed in Section II.

The proposals also differ with respect to the strike price level for the call option-style reserve product. The ISO Proposal would set the strike price "at the money" (i.e., at the level of the forecasted LMP), while the NEPOOL Proposal would set the Strike Price at $10 above the forecasted LMP. We support the NEPOOL Proposal regarding the strike price level for reasons which are discussed in Section III.

III. PROCUREMENT OF REPLACEMENT RESERVES IN ALL MONTHS AND FOR LOAD FORECAST ERROR

We support the ISO Proposal to fully represent the its reliability criteria in its day-ahead market with the proposed replacement reserve requirement. The ISO has proposed to set the market procurement in accordance with the quantities of resources needed to satisfy NPCC criteria to have reliability day-ahead operating planning including the ability to restore 10-minute and 30-minute reserves within certain clearly established time frames. Importantly, this is a reliability mandate that applies throughout the entire year. The NEPOOL proposal would eliminate this requirement for nine months out of the year and eliminate the amount for load forecast error entirely, viewing it as unnecessary. Even if NEPOOL is right that commitments have not been needed outside of the winter months, it is not because there is no requirement – it is because of excess supply. Therefore, it is not reasonable to eliminate the requirement, but instead to procure the supply at a low price that reflects the prevailing excess.

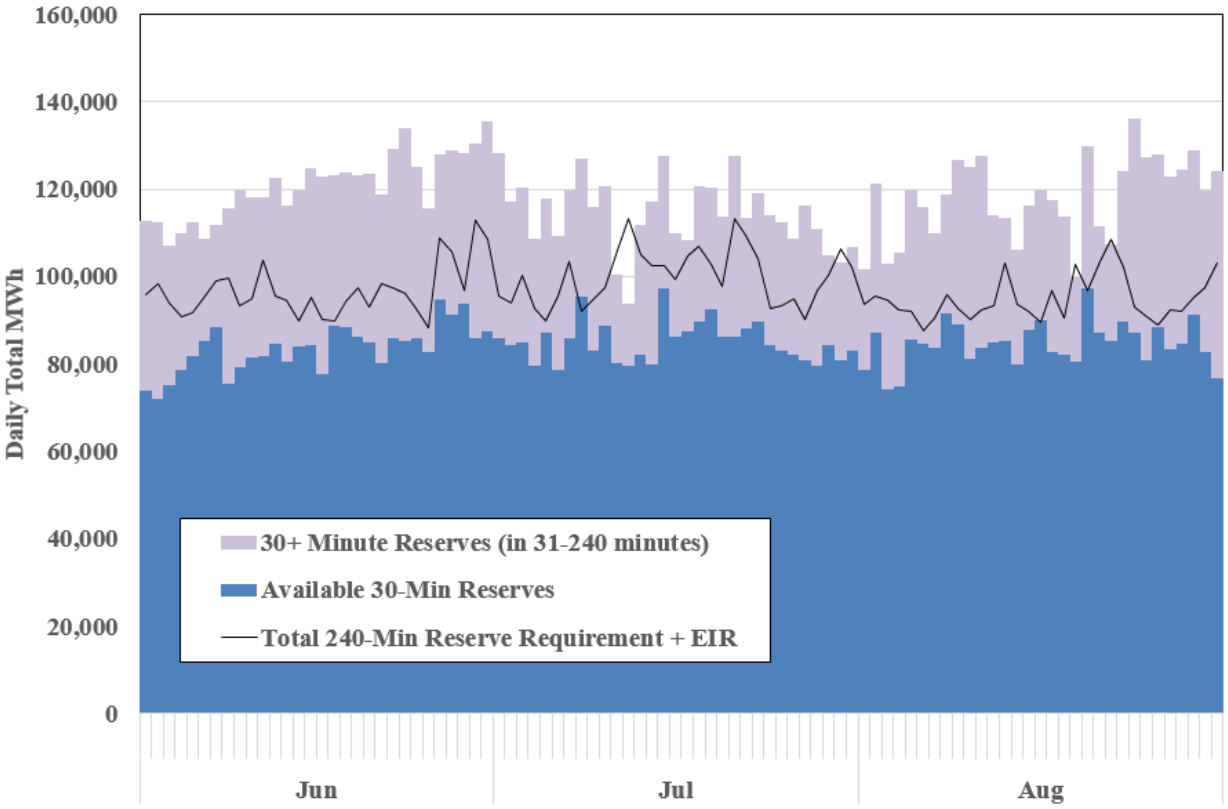
Supplemental commitment to satisfy replacement reserve requirements have not often been necessary in recent years because of the availability of latent reserves. For instance, in 2019, we found that commitment for system-level energy and reserve needs occurred on just two days after the day-ahead market during the months of June, July, and August. However, this market will not be implemented until June 2024, so the resource mix may change in ways that reduce the availability of latent reserves. If the ISO Proposal is adopted and latent reserves are always

adequate in the future, we expect competition will lead to relatively low prices for replacement reserves. However, if the NEPOOL Proposal is adopted and latent reserves are not adequate to satisfy the replacement reserve requirement, the ISO will be required to make distortionary out-of-market actions.

We evaluated the availability of latent reserves to satisfy the 240-minute replacement reserve requirement on each day in the summer of 2019 to determine how much excess reserve capability is normally available in New England. The following figure shows how often the forecasted energy and total 240-minute reserve requirement could have been satisfied by available capacity on each day. The figure summarizes the total available capacity that was not scheduled for energy in the day-ahead market but that was offering to be available within 4 hours in the following categories:

- *Available 30-Minute Reserves* – This includes the headroom of online capacity that is rampable in 30 minutes and offline capacity from available fast-start resources (the blue area).
- *Available 30+ Minute Reserves* – This includes the headroom of online capacity that is rampable beyond 30 minutes and offline capacity from available non-fast-start resources that are capable of providing energy in 4 hours (i.e., the Cold Start Up Time + Cold Notification Time < 4 hours).
- *The total 240-Minute Reserve Requirement Plus Additional Energy Imbalance Reserve Requirement* – This represents the required total amount of reserve capability to meet the forecasted energy and reserve needs for each operating day (the black line).

Daily Available Latent Reserves versus 240-Minute Requirement in Summer 2019



The figure shows that there was usually enough generating capacity submitting offers to be available within four hours to satisfy the forecasted energy and reserve needs. However, the actual availability of these resources on each day is uncertain because they had no day-ahead reserve obligations to pre-arrange fuel and may have difficulty obtaining fuel on short notice if needed. [3]

We estimated that the forecasted energy and reserve requirements would not have been satisfied on two out of 92 days if the additional capacity (rampable in 31 to 240 minutes) had been fully available. However, the margin averaged just 24 percent of the daily requirement, and it could be smaller in future years because of several factors.

[3] The calculation of available reserves reduces the total capability of flexible hydroelectric units based on their available inventory, but gas pipeline limitations and other fuel limitations are not considered.

- Our estimates do not reflect energy limitations on certain gas-fired resources that face pipeline gas limitations.
- The summer of 2019 was relatively mild, reducing the amount of capacity needed under peak load conditions.
- The resource mix may change in the coming years with retirements of fossil-fired units and new entry of renewable resources. Higher penetration of renewable resources will also increase the reserve requirement.

Therefore, it is very important to have a market mechanism that will provide transparent and efficient price signals that reflect underlying reliability needs and provide greater incentives for market participants to ensure their capacity available on the operating day with greater certainty.

In the next five to ten years, it is expected that falling battery storage costs will make these units sometimes more profitable than conventional peaking units. Currently, the New England market is providing incentives that would be most attractive for batteries with relatively short storage capacities (~two hours). We estimate that for every 1 GW of older conventional generation that retires and is replaced by an equivalent amount of battery storage resources with significant energy limitations, the availability of latent 240-minute replacement reserves could fall by up to 22 GWh per day. Given that the latent reserve margin in the summer of 2019 exceeded 22 GWh on 39 percent of days, it is likely that if the year-round replacement reserve requirements are not adopted, we may see significant reductions of latent reserves and resulting supplemental commitment for reliability.

Hence, retaining the replacement reserve requirement will: a) ensure the ISO does not have to resort to OOM actions and b) encourage better investment and retirement decisions. To the extent that older resources leave, it is more likely to be less-flexible longer lead time units.

Additionally, to the extent battery storage come in, a replacement reserve requirement will provide incremental incentives for batteries to increase the storage durations from 2 hours.

IV. STRIKE PRICE LEVEL FOR CALL OPTION STYLE PRODUCT

ISO New England has proposed a new type of day-ahead contract that would settle as a call option for energy with a strike price equal to the expected value of the real-time LMP. The option style contract has some desirable features, including that it would: (a) provide stronger incentives for generators to be available when needed for reliability; and (b) allocate reserves to resources that would be most economic to provide energy if needed in real-time.

On the other hand, use of the option style contract would require loads to take day-ahead positions in energy that substantially exceed their expected real-time energy needs, since loads would be required to purchase "at the money" call options for an amount of operating reserves that is extremely likely to exceed the amount that would be converted to energy in real-time. Ultimately, it is difficult to predict the extent to which the option style contract will allow the ISO to maintain reliability more efficiently than it would using the conventional forward contract for ancillary services.

The NEPOOL Proposal would raise the strike price to $10 per MWh above the expected value of the real-time LMP in order to reduce the anticipated costs to consumers. The Analysis Group was retained by the ISO to evaluate the costs and outcomes of the proposed ESI products under different conditions and utilizing different parameters.

The Analysis Group report says that while this design change would have relatively small consumer cost impacts in its severe winter weather cases (see "Winter Frequent" and "Winter Extended" cases), it would reduce the proposal's incremental cost to consumers in the day-ahead and real-time markets by 14 to 37 percent in its mild winter and its non-winter cases. The actual

net impact on consumer costs from the ESI proposal (regardless of whether the strike price increase is adopted) is likely smaller than shown in the Analysis Group report because increases in day-ahead and real-time market revenues to generators tend to lower capacity procurement costs by reducing the revenue that generators must recoup in the capacity market to remain in service or enter the market. However, it would not be desirable to create a market that leads generators to incur additional costs to be available beyond what is needed by the ISO to maintain reliability.

We believe that the incentive to be available when needed would not be significantly diminished by the reduced cost of close-out by up to $10 per MWh. This amount would be a very small portion of the overall close-out costs during tight market conditions, so the increase in strike price is unlikely to have a significant impact on incentives to obtain fuel during periods when it would be most important for maintaining reliability. Recent simulations found that suppliers would have reduced incentives to hold fuel oil based on estimated net revenue reductions of 1 to 7 percent for generators in its severe winter weather cases. The estimated net revenue reductions are proportionally larger during mild winter conditions but still modest in absolute terms. Additionally, the simulations did not quantify the foregone profits associated with not procuring fuel. As the strike price is raised, the reduction in close-out costs of not procuring fuel would be offset by an increase in foregone profits of not procuring fuel (in the $10 range). Therefore, including the costs of these foregone profits would partially offset any reduction in incentives to hold fuel and further mitigate the concerns associated with raising the strike price.

We do not think that this analysis raises significant concerns that the bias would materially impair generator incentives because:

- The overall net revenue impacts are very small, and they only account for a significant share of the impacts during moderate market conditions when reserve providers are less likely to materially impact reliability if unavailable.
- Although the net revenue from covering may be reduced, it does not necessarily mean that the supplier will not provide reserves reliably. For example, a high cost oil-fired peaking unit may have a decreased incentive to cover (i.e., generate energy), but that does not mean that it is not providing reserves that the ISO can depend on to maintain reliability.

Therefore, we support NEPOOL's proposal to raise the strike price by $10 per MWh from the expected real-time price level. While it is impossible to estimate the optimal amount by which the strike price should be increased, there is ample information to suggest that:

- This change would not undermine the market and reliability benefits of satisfying reserve adequacy needs within the market, but
- Would reduce the likelihood that the day-ahead ancillary services market would lead to excessive costs to consumers to during mild and moderate operating conditions.

Additionally, it will be important to assess the efficiency of the strike price level on an on-going basis.

V. CONCLUSION

WHEREFORE, for the foregoing reasons, Potomac Economics, Ltd. respectfully requests the Commission to grant its motion to intervene in this proceeding, accept these comments. Overall, we support the new day-ahead ancillary services products proposed by ISO New England. We believe these products will:

- Improve the ISO's day-ahead commitments and schedules;
- Allow prices to more fully reflect the ISO's reliability needs; and

- Improve suppliers' short-term incentives to be available when needed and their long-term investment and retirement decisions.

However, we agree with NEPOOL that raising the strike price of these products is reasonable and would likely lower the overall costs of satisfying these requirements.

Respectfully submitted,

/s/ David B. Patton

David Patton
President
Potomac Economics, Ltd.

CERTIFICATE OF SERVICE

I hereby certify that I have this day e-served a copy of this document upon all parties listed on the official service list compiled by the Secretary in the above-captioned proceeding, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated this 15th day of May, 2020 in Fairfax, VA.

/s/ David B. Patton