# MA AGO Amendments to ISO-NE Energy Security Improvements Proposal

NEPOOL Markets Committee

January 14, 2020

# INTRODUCTION

- The MA AGO is proposing 2 separate amendments to ISO-NE's ESI proposal at this time.
- Each is a stand alone to be voted separately.
- Each is intended to afford an opportunity to evaluate ESI or improve its value.

# Proposed Amendments

**Amendment #1:** Eliminate RER from the ESI design.

**Amendment #2:** Add a look back provision to the ESI program to enable evaluation of its efficacy.

# Amendment # 1: Remove RER from the ESI Design

**Purpose:** This amendment eliminates RER.

**Method:** Strike all language on RER-90 & RER-240.

*Amendment may be modified or withdrawn subject to receipt of additional analysis and impact analysis runs.*

# **Recall**: ISO-NE Objectives for RER

*Slide 55: July 8-10 ESI presentation*

**Goal #1:** Ensure the next-day operating plan as produced by the day-ahead market will award sufficient 'replacement energy' options to be able to restore operating reserves consistent with NERC/NPCC restoration time standards, should a contingency occur in any hour

**Goal #2:** Account for load forecast *error*

~~**Goal #3:** Account for energy supply *uncertainty* from day-ahead cleared energy~~

*Goal #3 has been dropped from the April 2020 Filing, but may be addressed subject to FERC approval of core design (July 8-10 ESI Presentation, Slide 64)*

# RER should be removed from ESI design for five reasons

- **Excessive:** RER may be "baking in" a higher level of reliability than required under NERC/NPCC requirements: it is a reserve product for reserve products.
- **Process:** ISO-NE has not provided methodology for RER load forecast *error* or supply *uncertainty.*
  - Load forecast error component could result in very large option purchases; Analysis Group impact analysis does not assess quantity and cost of covering forecast error.
- **Value:** RER has no demonstrated market efficiency or reliability benefit.
- **Theory:** As designed, RER doesn't ensure ability to recover the system.
  - There are instances where ISO could procure "enough" RER but be unable to recover the system after a large contingency.
- **Ease:** Removing RER does not disrupt other components of ESI design.

# **Excessive:** Other ISO/RTOs see no need for RER style products

Different is not intrinsically bad, but…

- ISO-NE has not shown that it has had trouble recovering reserves historically, or that it expects to in the future.
  - No evidence that load is receiving uncompensated benefits or that RER improves extant price formation problem.
  - ISO-NE does not offer a real-time RER analogue in today's market.
- The "problems" which RER seeks to address are not included on IMM or EMM State of Market Report recommendation lists.
- No other ISO/RTO offers an RER-style product.
  - NYISO, PJM, MISO subject to same sorts of NERC or NPCC standards.
  - Some account for N-1-1 or forecast error via unpriced RAA commitments (cf. ISO-NE, Day-Ahead Enhancements; Tech Session 2, April 2, 2019).

# **Process**: RER design remains incomplete

- "Load forecast error" isn't defined and could be used as blank check for GWs extra RER procurement.

- ISO-NE has not provided its methodology for RER load forecast *error* or supply *uncertainty,* though it may in 1Q2020.
  - ISO-NE is "still assessing" approaches to include this uncertainty in the RER requirements (August 13-15 ESI presentation, slide 49).
  - ISO-NE presented some estimates of the magnitude of load forecast error, but has not provided its opinion on the *right* amount to procure.

- Despite being undefined, "load forecast error" is still included in ISO-NE's September redlines (*see* III.1.8.5.d-e).

# **Value**: RER has no demonstrated economic or reliability value

- ISO-NE has indicated that it will run an Impact Analysis scenario excluding RER in all hours.
  - We will return to the MC with our assessment of those results when they are presented.
- To date, Impact results imply that RER has little value.
  - All scenarios have indicated zero hours of scarcity (under both ESI and CMR).
    - This implies that RER would not be needed to avoid an energy shortage.
  - Direct costs hard to ascertain from Impact Analysis, but buying 1,200 MW of RER options will undoubtedly increase costs.
    - Impact Analysis indicates direct RER costs of $27 to $119 million for winter season. Some fraction is returned via RT settlement.
    - RER procurement also increases prices of other products due to cooptimization.

# **Theoretical Flaw**: RER doesn't ensure full system recovery

- ISO-NE frames RER as a "day-ahead means to assure replacement energy" (e.g., June ESI Presentation, Slide 10).
- But, even if we buy "enough" RER in the DAM, we can *still* end up in a situation where there is insufficient energy to recover reserves after contingency.
  - ISO-NE staff agrees this outcome is possible (the following example is adapted from a conversation with Andy G.)
- Not clear that this is a *likely* outcome, but it is certainly a *possible* outcome.
  - The lack of a real-time equivalent/analogue to RER puts ISO into this position (not true with GCR: Operating Reserves or EIR: RAA).
- RER requirements may lead to *less severe* shortages than if RER set to zero, but ISO-NE hasn't demonstrated the value of any RER quantity.

*Example provided in Appendix*

# **Ease**: Removing RER does not disrupt other ESI components

- RER can be removed from ESI design without hindering function of GCR and EIR (this contrasts with claims that EIR and GCR interact and moderate one another).

# Conclusions Amendment # 1

- Lack of current RT RER suggests lack of need. RER offers reliability in excess of what is offered by other ISO/RTOs.
- RER has theoretical flaws which might hamper its ability to assure replacement energy after a contingency.
  - DA only product design (without RT analogue) is fundamentally flawed.
- RER design remains incomplete. ISO-NE has not specified the allowance for forecast energy error or done any work to demonstrate that that proposed quantity is just and reasonable
- RER has not demonstrated economic or reliability value in the Impact Analysis
- RER can be removed (or zeroed out) without harming other elements of the ESI design.

# Amendment #2

- No later than December 2027, the EMM will report on the performance of the first three years of the ESI program.
- In its  evaluation the EMM will use pre-defined performance criteria.
- ISO-NE will develop the performance criteria and will vet them through the NEPOOL stakeholder process.
- ISO will finalize the ESI evaluation criteria by December, 2021.
- Based on the recommendations of the EMM report, and with NEPOOL and IMM input, ISO-NE will develop program adjustments or explain why it believes they are unnecessary.

# Amendment #2 Rationale

- ISO-NE has not defined the measures of success that will be used to evaluate the effectiveness of ESI, or any process for recalibration over time.
- ISO-NE should provide, and vet through the NEPOOL stakeholder process, criteria for evaluating the efficacy of the ESI design and assessing its impacts, both in the short and long term.
- If ESI does not meet those criteria then ISO-NE should be required to modify the design.

# Conclusions Amendment # 2

- This amendment encourages a timely review of ESI's performance and a mandate to correct any deficiencies or unanticipated effects after ESI has had a reasonable amount of time to generate performance data.

- Prior agreement about performance criteria will foster fairness and transparency.

# Questions?

# Appendix

# RER Dispatch Example Setup

## Supply:

- Six units (A-F). Each unit has
  - EcoMin of 100 MW
  - EcoMax of 500 MW
  - 1 MW/min ramp rate (240 MW in 4 hour RER window).
- Monotonically increasing offers for energy & ESI options ( A < B < … < F )
- Other units providing more energy and/or reserves

## Demand:

- From these six units, we need:
  - 1800 MW of energy
  - 500 MW of RER options
- From other units we need more energy and ESI options (GCR, EIR)
  - Details do not matter for this example.

# RER Dispatch Shortfall

## 1. Day Ahead Market

Clearing engine procures sufficient energy & RER

- Units A-E committed.
- Unit C is marginal in DAM.
- Unit E commited for energy at EcoMin.
- Unit F is unscheduled.

| Unit Attrib. | | | DAM | |
|---|---|---|---|---|
| Unit | Emin | Emax | Energy | Options |
| A | 100 | 500 | 500 | |
| B | 100 | 500 | 500 | |
| C | 100 | 500 | 480 | 20 |
| D | 100 | 500 | 220 | 240 |
| E | 100 | 500 | 100 | 240 |
| F | 100 | 500 | 0 | 0 |
| Total | | | 1800 | 500 |

## 2. Real-Time (Pre-Contingency)

System redispatched to reduce production costs

- Unit C increases energy by 20 MW.
- Unit E can't be backed down below its EcoMin.
- Unit D output reduced by 20 MW.

| Unit Attrib. | | | RT (Pre Contingency) | |
|---|---|---|---|---|
| Unit | Emin | Emax | Energy | Ramp Potential |
| A | 100 | 500 | 500 | |
| B | 100 | 500 | 500 | |
| C | 100 | 500 | 500 | |
| D | 100 | 500 | 200 | 240 |
| E | 100 | 500 | 100 | 240 |
| F | 100 | 500 | | |
| Total | | | 1800 | 480 |

## 3. Real-Time (Contingency + 4 Hours)

Unit A trips, resulting in 500 MW energy loss.

- Units outside example provide TMSR/TMNSR/TMOR.
- Units B&C already at producing at EcoMax.
- Units D&E ramp up to recover reserves to extent possible.
- **System left with a 20 MW shortfall after RER deployed**

| Unit Attrib. | | | RT (Post Contingency) | |
|---|---|---|---|---|
| Unit | Emin | Emax | Energy | Ramp Potential |
| A | 100 | 500 | 0 | |
| B | 100 | 500 | 500 | |
| C | 100 | 500 | 500 | |
| D | 100 | 500 | 440 | |
| E | 100 | 500 | 340 | |
| F | 100 | 500 | 0 | |
| Total | | | 1780 | 0 |