August 31, 2018

BY ELECTRONIC FILING

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: ISO New England Inc. Compliance Filing to Establish a Fuel Security Reliability Standard, Short-Term Cost-of-Service Mechanism, and Related Cost Allocation for Out-of-Market Compensation in Docket No. EL18-182-000, and Docket No. ER18-___-000

Dear Secretary Bose:

Pursuant to the order of this Commission dated July 2, 2018 ("July 2 Order"),[1] ISO New England Inc. ("ISO") hereby electronically submits this transmittal letter and proposed revisions to the ISO Tariff.[2] The ISO respectfully requests that the Commission accept this compliance filing to be effective 60 days from the date of filing, on October 30, 2018.

I. Introduction and Overview of the Filing

As set out in the July 2 Order, the Commission, acting *sua sponte*, exercised its authority under Section 206 of the Federal Power Act,[3] finding that:

> Based on the evidence in this proceeding, including ISO-NE's OFSA[4] and Mystic Retirement Studies, we are concerned that ISO-NE's Tariff does not sufficiently

[1] *Order Denying Waiver Request, Instituting Section 206, and Extending Deadlines, ISO New England Inc.*, 164 FERC ¶ 61,003 (2018).
[2] Capitalized terms used but not otherwise defined in this filing have the meaning ascribed to them in the ISO New England Inc. Transmission, Markets and Services Tariff ("Tariff").
[3] 16 U.S.C. § 824e (2012).
[4] ISO New England Inc. Operational Fuel Security Analysis ("OFSA"), *Operational Fuel-Security Analysis*, ISO New England Inc. (Jan. 17, 2018), https://www.iso-ne.com/static-assets/documents/2018/01/20180117_operational_fuel-security_analysis.pdf. The OFSA was discussed in detail in the ISO's May 1, 2018 *Petition of ISO New England Inc. for Waiver of Tariff Provisions* in Docket No. ER18-1509-000 ("Waiver Petition"), and the testimony of Peter Brandien that accompanied that

> address the fuel security issues currently facing the region, which could result in a violation of mandatory reliability standards. Accordingly, pursuant to FPA section 206, we direct ISO-NE…to submit within 60 days of the date of this order interim Tariff revisions that provide for the filing of a short-term, cost-of-service agreement to address demonstrated fuel security concerns … ."[5]

The Commission elaborated that the submission of Tariff provisions should: (1) create the generally-applicable provisions that allow for the retention of a resource for fuel security reliability reasons and enable the use of a short-term cost-of-service agreement, (2) provide for an *ex ante* cost allocation methodology for the cost-of-service agreement,[6] and (3) address how such retained resources that utilize a cost-of-service option should be treated in the Forward Capacity Market.[7]

This compliance filing proposes revisions to the ISO Tariff to effect those changes, and uses as its basis the system study methodology and assumptions that the ISO relied on in its Waiver Petition[8] to identify when the loss of a retiring resource creates an unacceptable reliability issue. The Commission explicitly found that methodology and related assumptions to be reasonable in the July 2 Order.[9]

As directed by the Commission, these changes are "interim" in nature and will only be in effect for the 13th, 14th, and 15th Forward Capacity Auctions ("FCAs"), which run for Capacity Commitment Periods 2022/23, 2023/24 and 2024/25. These provisions sunset after FCA 15, as later commitment periods will address fuel security concerns using a longer-term market solution. The ISO will file the longer-term market solution by July 1, 2019, as directed by the Commission, and work towards implementing the solutions as soon as feasible.[10] However, given uncertainties around the design and implementation requirements of the longer-term market solution, as well as the significant reliability issues at stake, the ISO believes that the extension of the ability to retain resources through FCA 15 is the more prudent approach.

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submission. *See* Testimony of Peter Brandien on Behalf of ISO New England Inc., Petition for Waiver, May 1, 2015 in Docket No. ER15-1502-000 ("Waiver Testimony").

[5] July 2 Order at P 55. The July 2 Order also provided that, alternatively, the ISO could show cause why its current tariff provisions are just and reasonable despite the acute issues identified regarding fuel security in the New England region. The July 2 Order further directed the ISO "to submit by July 1, 2019 permanent Tariff revisions reflecting improvements to its market design to better address regional fuel security concerns." *Ibid.* Those revisions will be made in a later filing on the schedule provided by the Commission.

[6] July 2 Order at P 58.

[7] *Id.* at P 56-57.

[8] Waiver Petition at pp. 9-10, 13-15. *See also* Waiver Testimony at pp. 19-25.

[9] *See* July 2 Order at P 49. "We find ISO-NE's methodology and assumptions in the OFSA and Mystic Retirement Studies reasonable and accept ISO-NE's conclusions that the retirement of Mystic 8 and 9, under current ISO-NE Tariff provisions, could cause ISO-NE to violate mandatory reliability standards as soon as 2022." *See also, Id.* at PP 50-51.

[10] The retirement submission window for FCA 15 closes towards the end of March 2020, a little less than nine months after the ISO's longer-term market design solution will have been filed.

In support of the Tariff changes, this transmittal letter describes the generally-applicable fuel security reliability review standard that will be used to determine whether a retiring generating resource is needed for fuel security reliability reasons. The ISO is also submitting the testimony of Peter Brandien, Vice President of System Operations, in support of these provisions.

Mr. Brandien's testimony provides an overview of the ISO's refinements to the fuel security review methodology and assumptions that the Commission determined to be reasonable in the ER18-1509-000 Waiver Petition docket.[11] The ISO revised certain inputs to the fuel security review process, both in response to stakeholder feedback and to improve the balance between regional reliability needs and market efficiency. Resources retained for reliability adversely impact the efficiency of the market, and the ISO is exercising its best judgment to balance those impacts against reliability needs.[12] The revised assumptions are discussed in the testimony of Mr. Brandien.[13]

This transmittal letter also specifies a cost allocation methodology based on the ISO's review of Commission precedent. The Commission has in past cases determined that the appropriate cost allocation for the winter reliability program, which similarly addressed the issue of ensuring adequate energy supplies in the region, should be regional Real-Time Load Obligation. The ISO therefore proposes the use of Real-Time Load Obligation, which should be applied on a region-wide basis, in recognition of the regional nature of the fuel security problem. That said, stakeholders have proposed an alternative allocation that the ISO would also be able to implement should the Commission determine that it is more appropriate.[14]

As directed by the Commission, this transmittal letter also reviews the proposed treatment in the FCA of a retiring generator needed for fuel security reasons that elects to remain in service.[15] In more detailed support of those provisions, the ISO is providing the testimony of ISO economist Christopher Geissler, Ph.D. Dr. Geissler's testimony explains that the ISO has reviewed various options for treatment of a retiring generator that is needed for fuel security reasons and opts to remain in service, including the two possibilities raised by the Commission in the July 2 Order.[16] However, as Dr. Geissler explains, the concepts raised in the July 2 Order lead to the over-procurement of capacity by awarding CSOs to resources that are not needed for resource adequacy once the contributions of the resources retained for reliability are considered. Dr. Geissler further

[11] July 2 Order at PP 49-51.
[12] Brandien Testimony at pp. 9-16.
[13] *Ibid.*
[14] *See* the further description of this alternative in Section III.B of this transmittal letter.
[15] Under the currently effective Tariff, Existing Generating Resources that seek to retire but are needed for reliability reasons and choose to remain in service (generators needed for reliability reasons may still elect to retire) are eligible for two forms of compensation: either their approved Retirement De-List Bid price or a Commission reviewed and approved cost-of-service agreement. *See* the ISO Tariff at III.13.2.5.2.5.1. The ISO's proposal offers these same options to retiring resources that are needed for fuel security reliability reasons. The price treatment in the FCA is a separate issue from the compensation that a retained resource is eligible to receive.
[16] July 2 Order at PP 56 and 57.

explains that the FCA clearing price would not correspond to capacity's Marginal Reliability Impact ("MRI") value, as determined by the sloped demand curves, resulting in an inconsistency between the benefits and costs of capacity procured in the FCA.[17]

In addition to affecting capacity market prices, this inconsistency may incent continued operation of costly existing resources that would otherwise retire and unneeded entry from new resources, thereby exacerbating the over-procurement concern.[18] Conversely, by entering resources retained for fuel security as price takers in the auction, as the ISO proposes to do in this filing, the FCA clearing price will be based on an aggregate MW quantity that accounts for the resource adequacy contributions of resources retained for fuel security. This outcome results in a price that reflects capacity's true MRI value.[19]

Dr. Geissler also explains that the price-taking approach does not result in price suppression in the auction, but rather a competitive price for resource adequacy similar to that which would result if the ISO could model the fuel security issue as a constraint in the FCA. If the ISO were to develop a new constraint in the FCA that reflects the region's fuel security needs, it would produce an FCA clearing price for resources acquired (solely) for resource adequacy that is equivalent to the price that occurs under the ISO's proposed treatment. This competitive price is lower than that which would result from either of the concepts proffered by the July 2nd Order. Because the ISO's proposal produces the same capacity clearing price for resource adequacy as would occur if the FCA added a new constraint to reflect the region's fuel security needs, it is correct to conclude that it produces a competitive FCA price that is not suppressed.[20]

That said, the price taker treatment (like the alternatives proposed by the Commission) fails to compensate resources that provide both resource adequacy and fuel security for this latter reliability attribute in a uniform and transparent manner, and it is not feasible to develop a fuel security constraint for FCA 13.[21] Accordingly, although the ISO was unable to develop an appropriate fuel security compensation mechanism to supplement price taker treatment within the 60-day compliance window, the ISO commits to working with stakeholders to identify an alternative that can be developed in time for FCA 14 and 15.

Finally, this transmittal letter reviews each of the proposed Tariff revisions, including the timing and other rules regarding fuel security reliability reviews.

[17] Geissler Testimony at pp. 11-15.
[18] *Id.* at pp. 15-16.
[19] *Id.* at pp. 17-20.
[20] *Id.* at pp. 21-26.
[21] *Id.* at pp. 25, 35-38.

II. Communications

In addition to those already identified for service in the official service lists for Docket EL18-182-000, communications regarding this filing should be directed to:

Theodore J. Paradise
Assistant General Counsel
Operations & Planning
ISO New England Inc.
One Sullivan Road
Holyoke, MA 01040
413-540-4585
tparadise@iso-ne.com

III. Compliance Filing Tariff Revisions

A. Fuel Security Reliability Review and Fuel Security Reliability Standard

In the July 2 Order, the Commission directed the ISO to create a short-term cost-of-service mechanism[22] to address identified fuel security needs, explaining that the inability of the current Tariff to retain a resource in the face of the demonstrated reliability need appeared to be unjust and unreasonable.[23] In so directing, the Commission first found that the ISO's methodology and assumptions in the OFSA and Mystic Retirement Studies that identified the need for the Mystic 8 and 9 for regional fuel security reliability were reasonable.

In designing generally applicable provisions for this Compliance filing, the ISO uses the methodology and many of the assumptions that it previously utilized in the OFSA and Mystic Retirement Studies with refinements resulting from stakeholder input over a multi-month process. Where the ISO has identified changes in its assumptions, the reasons for the changes from the OFSA and Mystic Retirement Studies are discussed below and in the supporting testimony of Mr. Brandien.

Finally, in designing a fuel security reliability standard, the ISO identified triggering criteria. As with criteria for other reliability standards, failure of the fuel

[22] *See* July 2 Order at P 2.
[23] *See* July 2 Order at P 49, explaining "…we preliminarily find that the ISO-NE Tariff may be unjust and unreasonable based on ISO-NE's demonstration in this proceeding that its Tariff fails to address specific regional fuel security concerns identified in the record." While the Commission directed the creation of a short-term cost-of-service agreement, as noted above in fn. 16, under the current Tariff, a retained resource may elect its approved Retirement De-List bid price in lieu of pursuing a Commission-approved cost-of-service agreement. The proposed tariff revisions provide for the option to elect the approved de-list price for resources retained for fuel security as well.

security reliability criteria will indicate that the standard has been violated and will result in the retention of a resource for fuel security reasons. The design of the criteria is discussed in more detail below and in the testimony of Mr. Brandien.

1. The Commission Has Determined that the Methodology and Assumptions for the OFSA and Mystic Retirement Studies, which the Compliance Revisions are Based On, are Reasonable

The current ISO Tariff allows for the retention of a resource for reliability reasons where the ISO identifies a violation of NERC, NPCC or ISO reliability criteria.[24] The ISO's Waiver Petition was driven by the fact that the Tariff did not include criteria that would allow for the retention of a resource for fuel security reasons. Recognizing that this lack of criteria to retain a resource through the Tariff may render it unjust and unreasonable, the Commission directed that provisions be developed and filed within 60 days of the July 2 Order.

The Commission found that the studies underlying the ISO's determination of need for Mystic 8 and 9 were based on reasonable assumptions and methodology. The Commission stated:

> We find ISO-NE's methodology and assumptions in the OFSA and Mystic Retirement Studies reasonable and accept ISO-NE's conclusions that the retirement of Mystic 8 and 9, under current ISO-NE Tariff provisions, could cause ISO-NE to violate mandatory reliability standards as soon as 2022.[25]

In finding the ISO's methodology and assumptions to be reasonable, the Commission addressed and rejected several arguments challenging the ISO's reliability studies. First, regarding the deterministic design of the ISO's studies, the Commission stated:

> Turning first to whether ISO-NE should have used a probabilistic analysis in both the OFSA and Mystic Retirement Studies, we find that it was reasonable for ISO-NE to use a deterministic analysis in this instance. In particular, we agree with ISO-NE that a deterministic analysis allows for assessing the reliability impact of the loss of an individual resource (here, Mystic 8 and 9) and also for identifying potential violations of reliability standards. Although there are other, commonly used ways to conduct predictive analyses, deterministic analysis is far from novel. Use of a deterministic analysis also is consistent with the type of analysis that ISO-NE uses to determine if a resource is needed for local reliability needs. The Commission has previously accepted deterministic analyses in other

[24] *See* Section III.13.2.5.2.5 of the ISO Tariff.

[25] July 2 Order at 49. *See also* P 50, "Commenters challenge ISO-NE's use of a deterministic analysis rather than a probabilistic analysis in both the OFSA and Mystic Retirement Studies, as well as the underlying assumptions in both studies. We find that the studies are reasonable and support our preliminary findings in this order."

circumstances, such as in the ISO-NE Winter Reliability Program, which addressed a similar need.[26]

The Commission next addressed arguments regarding the assumptions used by the ISO in conducting the OFSA and Mystic-specific reliability studies. The Commission rejected those challenges, further stating:

> Next, commenters challenge the assumptions used by ISO-NE in the OFSA and Mystic Retirement Studies. We recognize that it is indeed possible to achieve different results in a study by changing assumptions in the model used for that study. ISO-NE conducted several model runs for different scenarios in both the OFSA and the Mystic Retirement Studies using a variety of assumptions. As noted above, 17 of the 18 Mystic Retirement Studies showed that ISO-NE would violate NERC reliability criteria. We find that ISO-NE has used a reasonable methodology to analyze the available data under a rational set of assumptions to arrive at its conclusions in the OFSA and Mystic Retirement Studies.[27]

2. While Still Based Largely on the OFSA and Mystic Retirement Studies, the ISO Has Revised the Fuel Security Reliability Review in Response to Input and Updated Data

The fuel security reliability review is a 90-day winter energy analysis that builds on the methodology and assumptions developed for the OFSA, and used in the subsequent Mystic Retirement Studies. As noted above, the Commission found this methodology and the set of assumptions reasonable in the July 2 Order.

Using the same underlying model developed for the OFSA, the fuel security reliability review is designed to examine an entire 90-day winter season (December, January, and February) using a predefined range of scenarios, similar to those in the Mystic Retirement Studies, to assess the operational impacts presented by the retirement of an Existing Generating Capacity Resource from the Forward Capacity Market. For each scenario, the fuel security reliability review will measure the effects or operational impacts of the loss of the Existing Generating Capacity Resource throughout the applicable winter period, using the same operational metrics applied in the OFSA and Mystic Studies – that is, full utilization of Operating Procedure No. 4, Actions During a Capacity Deficiency ("OP-4"), and Operating Procedure No. 7, Action in an Emergency ("OP-7"). OP-4 and OP-7,[28] are the procedures the ISO follows when insufficient energy is available to meet total expected electricity demand while maintaining operating reserves to meet mandatory reliability requirements. The results of the fuel security

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[26] *Id.* at 50.

[27] *Id*. at 51. "ISO-NE states that the input assumptions it used when conducting the Mystic Retirement Studies reflected the best available data at the time it conducted its analysis, and the inputs represented either observed historical data or well-established projections. Further, according to ISO-NE, its input assumptions were sometimes even biased towards showing reduced fuel security concerns. In sum, we are persuaded that the record evidence supports the conclusion that, due largely to fuel security concerns, the retirement of Mystic 8 and 9 may cause ISO-NE to violate NERC reliability criteria" (footnotes omitted).

[28] The use of OP-4 and OP-7 are described in the Waiver Testimony at pp. 22-23.

reliability review will then be measured against the trigger criteria established in Appendix L of Section III of the Tariff, which is described further below.

As described in the testimony of Mr. Brandien, the fuel security reliability review will evaluate the operational impacts using pre-defined scenarios designed to test the system response without the retiring Existing Generating Capacity Resource against a range of sensitivities, like was done for the Mystic Retirement Studies.[29] The predefined scenario cases consist of three LNG-supply cases, each comprising six different scenarios, for a total of 18 scenario cases. The LNG-supply cases represent different levels of LNG injection, and each scenario within an LNG-supply case accounts for varying levels of electricity imports and fuel inventories. The amounts considered for each of these variable LNG inputs are described in the following table:

LNG in Bcf	Tie-line Import in MW	Dual Fuel Inventory (number of refills)
0.8	2800	1.25
0.8	3000	1.25
0.8	3500	1.25
0.8	2800	2
0.8	3000	2
0.8	3500	2
1	2800	1.25
1	3000	1.25
1	3500	1.25
1	2800	2
1	3000	2
1	3500	2
1.2	2800	1.25
1.2	3000	1.25
1.2	3500	1.25
1.2	2800	2
1.2	3000	2
1.2	3500	2

For the fuel security reliability reviews, the values assigned to some of the static input assumptions will be adjusted to correspond to the applicable year being analyzed. For example, as in the OFSA and Mystic Retirement Studies, the electricity demand for scenarios will be based on the 2014-2015 90-day winter electricity demand as adjusted to reflect the 90/10 peak load forecast, net of projected Energy Efficiency, based on the latest (most recent) Capacity, Energy, Loads, and Transmission Report ("CELT Report")

[29] Brandien Testimony at p. 8.

for the winter period of the year being analyzed. To illustrate, fuel security reliability reviews for the winter associated with Capacity Commitment Period 2022-2023, which correlates to the FCA 13, would use 20,342 MW (net peak load) as found in the 2018 CELT Report.[30]

Certain static input assumptions are also being adjusted to reflect new or updated data. Specifically:

> Natural Gas Supply: The amount of natural gas available for electric generation is one of the key study assumptions. Like the previously-performed fuel security analyses, the fuel security reliability reviews will assume local gas utilities' demand would be satisfied first, and the remaining natural gas pipeline capacity and LNG injections would be utilized for electricity generation. For the fuel security reliability reviews, the methodology for deriving the gas demand of local distribution companies ("LDCs"), and the maximum daily amount of gas that would be available to the electric power sector will be the same as that used in the OFSA and Mystic Studies. However, for the fuel security reliability reviews, the ISO will be using updated heating degree day temperature curves for estimating LDC gas demand. In addition, the ISO will be using updated vendor-supplied data annually on the sources of gas supply – the natural pipeline supply (i.e., Algonquin, Tennessee, Iroquois, and Portland Natural Gas Transmission System from the west, and Sable Island and Deep Panuke from the east); satellite LNG facilities used to support LDC behind-the-meter operations; and pipeline-connected LNG (i.e., Canaport, Distrigas, and the Excelerate off-shore buoy).[31]
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> Natural Gas Demand: The LDC demand modeled for the applicable year being analyzed will be held constant for analyses performed for FCA 14 (2023-2024), and FCA15 (2024-2025), instead of using the annual growth estimates in the 2016 study conducted by ICF International, Inc. for the ISO. This adjustment is based on the assumption that any growth in future forecasted LDC demand will be offset by an equivalent amount of increased supply. This increase in supply could come from a variety of sources, such as LNG contracts, peak shaving facilities, or incremental expansions to infrastructure. This is a change from the OFSA and Mystic Retirement Studies, which both accounted for growth of demand, but accounted for increased supply out only as far as petitions for new projects had been filed. The net effect of this adjustment is to assume that more energy is available past 2023.[32]
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> Resources Available for Dispatch:
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> (1) Renewables: In the fuel security reliability review, input assumptions relating to resources available for dispatch will be adjusted to reflect updated data. For example, as in the case of the previously-performed OFSA and Mystic Studies,

[30] *See* Brandien Testimony at p. 10.
[31] *Id.* at pp. 10-11.
[32] *Id.* at pp. 11-12.

the fuel security reviews will account for renewables, including on- and off-shore wind, photovoltaics (both behind-the-meter and commercial), and other renewables (e.g., biomass, refuse) based on the most recently-published CELT Report. However, modeling for the photovoltaic forecast, on-shore wind, and off-shore wind will be adjusted to reflect hourly profiles from the winter 2014-2015. The photovoltaic profiles will utilize the observed hourly profile for the winter 2014-2015, adjusted to reflect the expected performance of the fleet assumed to be in service in the study year through the ISO's photovoltaic forecast, and updated annually. For on-shore wind, hourly profiles from the 2014-2015 winter will be adjusted to reflect the expected performance of the fleet assumed in service in the study year, and updated annually. In general, there tends to be a good correlation between wind generation output and extremely cold weather. Therefore, the use of hourly profiles results in a greater amount of energy production available for dispatch in the model when the gas system is constrained, which would tend to show a reduced need for retention of a resource for fuel security reasons.[33]

(2) State Contract Resources: In addition to reflecting Existing Generating Capacity Resources and energy-only resources at their Seasonal Claimed Capability based on the most-recently published CELT Report (and Qualified Capacity for non-commercial Existing Generating Capacity Resources), as well as the ISO's forecast of energy efficiency and photovoltaic installations ahead to the study years, the fuel security reviews will differ from the previously-performed analyses in that the model will also reflect additional resources that are subject to a binding and enforceable contract under a state procurement. Specifically, the ISO will include in the model contracted resources that are expected to be in-service by December 1 (the start of the winter period) of the associated Capacity Commitment Period if information regarding such resources is made available to the ISO in time to allow for their consideration in the analysis. This change results in an increase in the energy available to the region for dispatch in the model and therefore reduces the need to retain resources for fuel security reasons.[34]

(3) Demand Response: Unlike the OFSA and the Mystic Retirement Studies, the fuel security reliability reviews will include active demand response resources at their Seasonal Claimed Capability reduction value as resources available for dispatch. In the OFSA, these resources were accounted for under OP-4 actions.

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[33] *Id*. at pp. 12-13.

[34] *Id*. at pp. 13-14. Certain stakeholders argued that the ISO should simply assume that states meet their regional portfolio standard targets. The ISO notes that it already accounts for forecasts of photovoltaics and energy efficiency that will be in place in the study years. The ISO's addition of resources contracted for by states attempts to include as much state investment as possible while accounting for possible delays in resource procurement. In the case of the ISO's approach, the ISO counts on executed and enforceable state contracts, even though having an approved contract does not necessarily mean projects will not run into siting delays and miss operational in-service targets as a result. The ISO therefore views its approach as optimistic in assuming no such delays for projects with approved and enforceable contracts, but reasonable given the existence of a state-approved contract.

However, as of June 1, 2018, these resources became integrated into New England's wholesale energy markets to be dispatched based on price in the same way generators are dispatched. The Mystic Retirement Studies did not reflect this change.[35]

Similar to the Mystic Retirement Studies, the only model input assumptions that will vary in the fuel security reliability reviews are: the amount of LNG injections; the amount of energy imports across the external ties; and the frequency of refilling dual-fuel oil tanks.[36] For the fuel security reviews, these assumptions will be adjusted from the Mystic Retirement Studies as follows:

LNG Injections: The fuel security reviews will only consider LNG injection levels of 0.8 Bcf/d, 1.0 Bcf/d, and 1.2 Bcf/d. These levels are consistent with those considered in the Mystic Retirement Studies, except they exclude the incremental 0.9 and 1.1 cases also used in the Mystic Retirement Studies.[37]

Electricity imports: The electricity import levels will be 2,800 MW, 3,000 MW, and 3,500 MW for every hour of the winter period of the year being analyzed. The only change from the Mystic Retirement Studies is a slight increase from the starting level of 2,500 MW. The 2,800 MW adjustment coincides with the higher imports observed over the 2017/2018 winter period.[38]

Dual-Fuel Oil Tank Fill Rate: The fuel security reviews will assume oil storage tanks at dual-fuel generation facilities will re-fill to a minimum of 1.25 and a maximum of 2.0. This is an increase to the minimum of one refill assumed in the Mystic Retirement Studies, and is greater than what was observed during the winter of 2017-2018. However, there are several initiatives being developed ahead of the 2018-2019 winter period intended to provide improved market signals for incentivizing resource preparedness. These efforts include establishing energy alert thresholds in ISO Operating Procedure No. 21 by providing the region a three-week look-ahead analysis based on actual fuel inventories to allow for proactive responses in advance of an Energy Emergency declaration, and enhancing the current treatment of a resource's opportunity costs in its energy supply offers, as well as the recent implementation of pay for performance. While it is too soon to predict the impact that these initiatives will have on the operations of the electric system, and how that may impact fuel availability and the dispatch order in the model, the ISO believes these refill levels are a reasonable proxy. Assuming an average dual-fuel tank of eight days, increasing

[35] As explained in the testimony of Mr. Brandien at page 14, the dispatch methodology is essentially the same between the OFSA and Mystic Retirement Studies with the exception of the Demand Response Resources being removed from OP-4 actions and being dispatched prior to OP-4 actions in the resource dispatch stack. This dispatch methodology change does not impact the output metrics utilized by the reliability standard for fuel security for unit retention.
[36] *See* table, *supra*, in this section.
[37] *See* Brandien Testimony at p. 15.
[38] *Ibid.*

the minimum to 1.25 refills results in the equivalent of increasing energy production of the model fleet by about two additional days.[39]

Collectively, the revisions described above generally increase energy availability in the assumptions of the fuel security reliability review, and ensure that, where data changes, inputs will be updated for the execution of this reliability review on any retirements submitted for FCA 14 and FCA 15. As noted above, this methodology, the reliability review process, and the fuel security reliability standard will all sunset after FCA 15, ensuring their use is of a limited duration as the ISO transitions to new market-based mechanisms to better address the region's fuel security issues.[40]

3. The Fuel Security Reliability Standard Provides a Clear Trigger Point that Indicates When the Results Observed in a Fuel Security Reliability Review are Unacceptable for Regional Power System Reliability

Like the Mystic Retirement Studies, the fuel security reliability review will produce a matrix of results from the various scenarios run. In order to make the fuel security reliably review function as a generally applicable ISO reliability criteria, the ISO has proposed a threshold, which if exceeded would indicate an unacceptable level of regional system reliability. This "trigger" criteria have two components, either of which will lead to the retention of the existing generating resource seeking to retire:

(i) depletion of 10-minute reserves below 700 MW in any hour in the absence of a contingency in more than one LNG-gas supply scenario case, *or*

(ii) the use of load shedding in any hour under OP-7 in any one scenario.

As discussed in the testimony of Mr. Brandien,[41] this criteria is similar to that used for the Mystic Retirement Studies except that the ISO has allowed for the reduction of 10-minute reserves, pre-contingency,[42] by approximately 50%. While the ISO must make preparations to have operating reserves pre-contingency in an operating year, [43] the ISO adjusted this trigger criteria from the Mystic Reliability Studies given that the fuel security reliability review is performed approximately three years ahead of the operating time frame. This allowance for the depletion of 10-minute reserves in the fuel security

[39] *Id.* at pp. 15-16.
[40] Pursuant to the Commission's direction for further required compliance set out in the July 2 Order (the ordering paragraph at (f)), those market-based mechanisms will be filed by July 1, 2019.
[41] *See* Brandien Testimony at p. 20-23.
[42] Unlike transmission planning standards and related studies, the fuel security reliability review does not apply system contingencies to identify reliability violations, for example the loss of lines or generators. The fuel security reliability review is a no-contingency analysis.
[43] NERC's BAL-002 R2 states: "Each Responsible Entity shall develop, review and maintain annually, and implement an Operating Process as part of its Operating Plan to determine its Most Severe Single Contingency and make preparations to have Contingency Reserve equal to, or greater than the Responsible Entity's Most Severe Single Contingency available for maintaining system reliability."

reliability review should not be understood to in any way indicate that the ISO will condone or allow for a violation of NERC criteria for the operating year, or that it will allow for the depletion of reserves pre-contingency in a way that would violate NERC-criteria and put the interconnection at risk in real-time operations. When necessary, in real-time operations, the ISO will use pre-contingency load shedding to maintain the needed generation reserves to meet mandatory reliability criteria.[44]

To codify this fuel security reliability standard, this criteria language is included in a new Appendix L to Section III of the Tariff. Similar to NERC reliability standards, the detailed implementing assumptions and methodology, which have been described in the ISO's Waiver Petition, and are modified for general applicability in this filing, will be contained in an Appendix I to the ISO's Planning Procedure 10. As is the case with transmission planning standard implementation, this allows for updates to be made to the various inputs to reflect the most recent data. A copy of PP-10, Appendix I is included as Attachment 5 to this filing for informational purposes in order to provide the Commission with a complete record on which to base its decision making.

B. Cost Allocation for Out-of-Market Compensation

In the July 2 Order, the Commission directed the ISO to include, as part of its proposed Tariff revisions, an *ex ante* cost allocation proposal[45] for resources retained for fuel security under out-of-market arrangements.[46] The Commission cited the ISO's assertion that, unlike the costs of resources retained for reliability, which are allocated to Regional Network Load of the affected reliability region, fuel security is a regional, rather than a local problem.[47] The Commission noted that it expected any cost allocation proposal to adhere to its cost causation precedent and appropriately identify the beneficiaries of the service rendered.[48]

In compliance with the Commission's directive, the ISO's proposed interim Tariff revisions include a proposal to allocate the out-of-market costs for resources retained for fuel security to load-serving entities on a regional basis using the Real-Time Load Obligation allocator. This allocation is consistent with the Commission's precedent for past cost allocation related to fuel security needs in the New England region.

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[44] *See* Brandien Testimony at pp. 22-23.
[45] July 2 Order at P 58.
[46] As discussed elsewhere in this transmittal letter, determining that a retiring existing generating resource is needed for fuel security will not necessarily result in a cost-of-service agreement. Such a resource may also elect to be paid its approved Retirement De-List price. Under the current Tariff, the delta between that amount and the FCA clearing price is an out-of-market cost that is allocated in the same manner as cost-of-service costs, in this case, per the ISO's proposal herein, to Real-Time Load Obligation.
[47] July 2 order at P 58, "We note that, unlike the costs of resources retained for reliability, which are allocated to Regional Network Load of the affected reliability region, ISO-NE explains that fuel security is a regional, rather than a local problem. We would expect any cost allocation proposal to adhere to our cost causation precedent and appropriately identify the beneficiaries of the service rendered" (footnotes omitted).
[48] *Ibid.*

Specifically, in its order accepting temporary Tariff changes to address generation shortfalls during the 2005-2006 winter, the Commission found that the joint ISO/NEPOOL proposal to allocate costs to Real-Time Load Obligation was just and reasonable.[49] Based on that precedent, in its order conditionally accepting the winter reliability program for the 2013-2014 winter, the Commission rejected the ISO's proposal to allocate costs to Regional Network Load.[50] The Commission reasoned that long-standing cost-causation and benefits/burdens principles provide that costs should be allocated to those who benefit from the incurrence of the costs. Because real-time load was the primary beneficiary, and the primary cost-driver, of the winter reliability program, the Commission found that allocating costs to Real-Time Load Obligation was appropriate.

The Commission stated:

> Long-standing cost-causation and benefits/burdens principles provide that costs should be allocated to those who benefit from the incurrence of the costs. As discussed below, ISO-NE proposed the Winter Reliability Program to address generation-related reliability concerns, not transmission-related concerns, through an interim program designed to ensure sufficient energy supply to meet real-time load during the coming winter. Because real-time load is the primary beneficiary, and the primary cost-driver, of the Winter Reliability Program, we find that costs of the Program should be allocated to Real-Time Load Obligation.[51]

Certain stakeholders have in the past argued that, even if Real-Time Load Obligation is the better allocator in theory, it will result in higher overall costs than Regional Network Load. The Commission also addressed those arguments in the winter reliability program proceeding, finding:

> ISO-NE and some commenters are concerned that, because LSEs often cannot pass costs through to their customers, allocating costs to Real-Time Load Obligation will cause LSEs to include risk premiums in their contracts, which will raise rates for consumers. Those parties argue that this possibility warrants

[49] *See ISO New England Inc. et al.*, 113 FERC ¶ 61,220 (2005) ("Winter 2005-2006 Order"), *order on reh'g*, 115 FERC ¶ 61,145 (2006) at P 34.

[50] *ISO New England Inc.*, 144 FERC ¶ 61,204 (2013) ("Winter Program I"), *reh'g denied*, 147 FERC ¶ 61,026 (2014) at P 70 ("Winter Program II").

[51] *See* Winter Program I at P 70. *See also*, Winter Program II at P 7 *citing to* Winter 2005-2006 Order. *See also*, *Id.* at P 24, "As to ISO-NE's proposal to allocate costs to Regional Network Load, we reaffirm the Commission's long-standing principle that costs should be allocated to those who benefit from the incurrence of the costs. As detailed below, the Winter Reliability Program is designed to ensure adequate electric energy supply to meet real-time load during the winter of 2013-2014; therefore, Real-Time Load Obligation should be allocated the costs. Thus, by the same token, we cannot find that the costs should be allocated to transmission customers because, although the Program indirectly enhances transmission system reliability, there is no direct benefit to Regional Network Load" (footnote omitted).

allocating costs to Regional Network Load. The Commission has rejected this argument in the past, and for the same reasons we do so here.[52]

The Tariff revisions submitted in this filing have the same goal as the Tariff revisions submitted for the 2005-2006 winter and the 2014-2015 winter, *i.e.*, to improve reliability by ensuring that adequate electric energy supply is available to meet real-time load during the winter. Therefore, because real-time load will be the primary beneficiary of the resources retained for fuel security, allocating out-of-market costs to Real-Time Load Obligation is consistent with the Commission's precedents, noted above, regarding cost causation and is therefore just and reasonable.

To establish this cost allocation methodology, the ISO is proposing to create Section III.13.2.5.2.5A(h). This provision notes that the compensation for resources needed for fuel security reliability reasons will utilize the Commission-approved compensation mechanisms set out at III.13.2.5.2.5.1 of the existing Tariff, with the variation that the costs shall be allocated on a regional basis to Real-Time Load Obligation in the same manner the Commission directed in the Winter Reliability Program dockets, i.e., excluding Real-Time Load Obligation associated with Dispatchable Asset Related Demand Resources (DARD Pumps and other electric storage based DARDs) and Real-Time Load Obligation associated with Coordinated External Transactions.[53] The allocation of charges for these cost-of-service agreements or approved Retirement De-List bid costs is further specified to be allocated and collected over a 12-month period.

In sum, per the Commission's guidance, the ISO has proposed what it believes to be the correct allocator based on a reading of the Commission's precedent on the topics of beneficiary pays and cost causation. That said, the ISO notes that the NEPOOL Participants Committee supported a proposal to allocate the out-of-market fuel security costs to Regional Network Load. Should the Commission agree with the NEPOOL Participants Committee, the ISO will implement that alternative allocator on a region-wide basis.

C. Treatment of Retained Resources with Out-of-Market Compensation in the Forward Capacity Market

In the July 2 Order, the Commission noted that there may be differences between retaining a resource for fuel security vs. retaining a resource for a violation of a NERC, NPCC or other ISO-NE reliability criteria under the existing Section 13.2.5.2.5.[54] The currently-approved Tariff specifies that resources that are retained for reliability are treated as price takers in the FCA. As discussed below, despite the Commission's note

[52] *See ISO New England Inc.*, 144 FERC ¶ 61,204 at P 76, *citing to ISO New England Inc.*, 113 FERC ¶ 61,220 at P 35.
[53] This allocation to Real-Time Load Obligation design was filed by the ISO on October 15, 2013 in Docket No. ER13-1851-000 and was subsequently approved by letter order on November 11, 2013.
[54] July 2 Order at P 57.

that there may be grounds to treat resources retained for fuel security differently, the ISO proposes herein to also treat these resources as price takers.

In noting that there may be differences between resources retained for fuel security reasons vs. another reliability reason, the Commission raised two possible alternatives to price taking treatment. Under concept 1, the retained resource would be removed entirely from the FCA. More specifically, the Order states that "the Tariff revisions could allow ISO-NE to retain resources [for fuel security] outside of the FCM construct."[55] Under concept 2, the Commission proposes that the ISO would not remove the resource from the FCA, but instead would bid the resource's capacity at the competitively-based price as determined by the Internal Market Monitor ("IMM"); the Order notes that "it may be reasonable for resources retained for fuel security purposes to be offered into the FCM at an offer price that is above zero, but still subject to mitigation by the IMM."[56]

As explained in the testimony of Dr. Geissler, the ISO reviewed both of these concepts and found that they created less desirable economic outcomes than continuing to treat resources retained for fuel security as price takers in the FCA.[57] Dr. Geissler explains that, because the contribution of the retained resources to resource adequacy may not be counted under either concept (depending on price in the second), the treatments noted in the July 2 Order would raise two concerns. First, because the FCA clearing would not account for a retained resource's contribution to resource adequacy, the region would procure excess resources. This would represent a costly and inefficient outcome that does not occur if retiring resources retained for fuel security reliability reasons are entered into the FCA as price takers.[58]

A second issue is that, under the two treatments noted in the July 2 Order, the costs incurred to procure incremental capacity in the FCA would exceed its benefit. This mismatch of costs and benefits in the FCA arises because the FCA clearing price would not correspond to capacity's MRI value (which is used to determine the FCA's sloped capacity demand curves).[59] In addition to affecting price signals, this inconsistency may skew retirement decisions of uneconomic resources and incent unneeded entry from new resources, thereby exacerbating the over-procurement concern. Conversely, by entering resources retained for fuel security as price takers in the auction, the FCA clearing price will be based on an aggregate MW quantity in a manner that accounts for the resource adequacy contributions of resources retained for fuel security. At this quantity, the demand curves will specify a price that reflects capacity's true MRI value, avoiding this cost-benefit inconsistency when the FCA is cleared.[60]

[55] *Id*. at 56.
[56] *Id*. at 57.
[57] Geissler Testimony at pp. 5-11.
[58] *Id*. at pp. 16-20.
[59] *Id.* at pp. 8, 11-16.
[60] *Id*. at p. 17, 20-21.

Certain stakeholders have objected to the ISO's price taker proposal on the grounds that it "suppresses prices." As Dr. Geissler explains, treating retiring resources that are retained for fuel security as price takers in the FCA does not suppress the price paid to other resources for their contributions to resource adequacy.[61] In fact, the ISO's proposed treatment will consider the resource adequacy contributions of the retained resources when setting capacity clearing prices, whereas the concepts proffered in the July 2nd Order may not. Because of the downward sloping nature of the MRI-based demand curves, considering the resource adequacy contributions of the retained resources will produce lower auction clearing prices than approaches that ignore these contributions. However, a lower price for providing resource adequacy is not equivalent to price suppression. Rather, the lower price accurately reflects the reduced resource adequacy benefit of capacity at the margin (where prices are properly set), after accounting for the resource adequacy contribution of the retained resource.[62]

While price taker treatment does not suppress prices paid to resources procured solely for resource adequacy purposes, such treatment (like the two proposals in the July 2 Order) fails to compensate resources that provide both resource adequacy and fuel security. Dr. Geissler explains this result by considering what would happen if the FCA were (hypothetically) modified to include a new, additional procurement constraint to reflect the region's fuel security needs. Under this hypothetical but informative scenario, the FCA clearing process would consider the fuel security contributions of resources when awarding CSOs, similar to how the FCA accounts for the locational value of capacity across capacity zones when clearing the auction.[63] This additional constraint would tend to provide higher compensation to fuel secure resources, and still specify an FCA clearing price for resource adequacy that is equivalent to the price that occurs under the ISO's proposed treatment.[64]

While the introduction of a fuel security constraint in the FCA may represent one approach to compensate resources for providing this attribute, it also presents several challenges. To translate this conceptual idea into an implementable design would require the ISO to develop rules that determine what resources are eligible to provide this service, and at what quantities. It would also require the ISO to define this product, to specify its demand for this product, and assess whether it comes with additional performance obligations. Because of these outstanding design questions, it is not feasible to develop a constraint that prices fuel security benefits, or any other methodology, to reasonably address this difficult issue in time for FCA 13.[65]

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[61] *Id*. at pp. 22-26.
[62] *Ibid.*
[63] Capacity awarded an obligation in a constrained capacity zone may provide slightly different reliability attributes than that in the Rest-of-Pool Capacity Zone. Nonetheless this capacity in a constrained zone is counted equivalently to that in Rest-of-Pool for purposes of determining system capacity awards and prices.
[64] This price for resource adequacy is lower than that which would result from either of the concepts proffered by the July 2nd Order. Because the ISO's proposal produces the same capacity clearing price as would occur if the FCA added a new constraint to reflect the region's fuel security needs, it is correct to conclude that it produces a competitive FCA price that is not suppressed. *Id*. at p. 26.
[65] *Id*. at pp. 32-38.

Despite the difficulties, the ISO commits to working with stakeholders to identify an alternative that can be applied for FCA 14 and 15 in conjunction with its efforts to continue to develop longer-term market solutions to the region's fuel security challenges. Among the ideas the ISO plans to assess is an incremental payment for resources that can help the region meet its fuel security objectives.

D. Overview of Fuel Security Reliability Review Tariff Provisions

The Tariff provisions contained in this filing have been designed to facilitate their limited term. Because the interim compliance terms are limited to FCAs 13, 14 and 15, the ISO has created a new Section III.13.2.5.2.5A and a new Appendix L to Section III to contain these interim provisions without having to extensively revise other provisions of the Tariff, which would then need to be reversed at a later time. While the core function of these provisions is to add a fuel security reliability review standard to the Tariff, there are enough provisions with variations from the usual reliability review conducted pursuant to Section III.13.2.5.2.5, *e.g.*, a different cost allocation, to warrant this separate section. The location between existing Sections III.13.2.5.2.5, "Reliability Review," and Section III.13.2.5.2.5.1, "Compensation for Bids Rejected for Reliability Reasons," is intended to facilitate ease of use of the new provisions given that they rely on and cross reference many of the provisions of these existing sections.

In addition to Section III.13.2.5.2.5A and Section III Appendix L, one other provision of Section III of the Tariff was revised in response to a stakeholder request. That section, III.13.2.5.2.5.1(e), adds additional information requirements to any cost-of-service filing. This revision is also discussed below in this section.

1. Effective Term and Sunset

Section III.13.2.5.2.5A(a) sets out the effective term and explicit sunset of the fuel security reliability review process. This limited term is consistent with the Commission's July 2 Order, which directed that the ISO establish "interim" Tariff provisions[66] and a "short-term" cost-of-service agreement.[67] That provision states:

> (a) This Section III.13.2.5.2.5A will remain in effect for the 2022/23, 2023/24 and 2024/25 Capacity Commitment Period, after which this Section III.13.2.5.2.5A will sunset.

As noted above, the ISO hopes to have its long-term market provisions in place to address fuel security reliability issues before stakeholders have to make decisions for FCA 15. However, given that the retirement deadline for FCA 15 is a little less than nine months after the Commission's directed compliance filing date of July 1, 2019 and the significance of the reliability issues involved, the ISO is including FCA 15 in these

[66] July 2 Order at PP 2, 55.
[67] *Ibid.*

provisions in order to maintain the ability to retain resources if the market solution cannot be implemented by the FCA 15 retirement deadline.

2. Applicability of Section III.13.2.5.2.5A and Conflicts

Section III.13.2.5.2.5A(b) sets out the scope of application of the new Section III.13.2.5.2.5A, explaining:

> (b) This Section III.13.2.5.2.5A will apply to (i) Retirement De-List Bids, (ii) substitution auction demand bids, and (iii) bilateral transactions and reconfiguration auctions demand bids submitted by an Existing Generating Capacity Resource that has been identified as being needed for fuel security during a Forward Capacity Auction. … .

The application of Section III.13.2.5.2.5A to resources that are attempting to retire, i.e., Retirement De-List Bids, and substitution auction demand bids[68] limits the type of resources that may trigger the retention and potential out-of-market compensation for fuel security reasons. The review has been limited by the ISO to retiring resources, rather than resources seeking to de-list for one-year periods, given that only retiring resources will be acting with finality to remove themselves from the bulk electric system, and will therefore be electrically unavailable even as energy-only units.[69]

Section III. 13.2.5.2.5A(b) continues, regarding conflicts between these interim rules and the rest of the Tariff:

> …Terms set out in this Section III.13.2.5.2.5A will apply only for the period and resources described within this Section III.13.2.5.2.5A. Where the terms and conditions in this Section III.13.2.5.2.5A differ from terms otherwise set out in Section III.13, the terms of this Section III.13.2.5.2.5A will control for the period and circumstances described in Section III.13.2.5.2.5A.

This provision helps insure that the ISO's approach of adding a temporary section regarding fuel security review, rather than marking up several sections of the Tariff, will function without confusion to the extent there is a provision elsewhere in the Tariff that may appear to conflict.

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[68] In addition to a Retirement De-List Bid, an Existing Generating Capacity Resource may seek to retire by submitting a demand bid in the substitution auction established by the Competitive Actions for Sponsored Policy Resources project, approved by the Commission in *ISO New England Inc.*, 162 FERC ¶ 61,205 (2018). If the existing resource submitting the demand bid can be replaced by a new state-sponsored resource that has submitted a supply offer, the existing resource will be retired. A resource need not first submit a Retirement De-List bid in order to submit a supply auction demand bid.

[69] Retirement of a generating resource requires the termination of the resource's current interconnection agreement. Pursuant to Section III.13.2.5.2.5.3(a)(1), once a resource is retired, it is removed from the ISO's energy management system, it's interconnection agreement is terminated, and it may not synchronize to and inject power onto the transmission system.

3. Provisions Regarding Fuel Security Assumptions and Methodology and the Fuel Security Reliability Standard

Section III.13.2.5.2.5A(c) identifies the key provisions used for conducting a fuel security reliability review, as well as the locations of those provisions, stating:

> (c) A fuel security reliability review for the Forward Capacity Market will be performed pursuant to Appendix L to Section III of the Tariff, and in accordance with the inputs and methodology set out to establish the fuel security reliability standard in Appendix I of Planning Procedure No. 10.

Appendix L to Section III of the Tariff and Appendix I to Planning Procedure No. 10 are discussed in greater detail above and in the testimony of Mr. Brandien.

4. Timing and Methodology of Fuel Security Reliability Reviews

Section III.13.2.5.2.5A(d) sets out the timing parameters for conducting a fuel security reliability review, explaining that these reviews will occur after the Existing Capacity Retirement Deadline, which occurs in the early springtime each year. The provision continues by setting out the rules for order of review, including the tie-breaking rules when Priced Retirement De-List Bids may otherwise appear the same.

> (d) For fuel security reliability reviews performed for the primary Forward Capacity Auction, the fuel security reliability review will be performed after the Existing Capacity Retirement Deadline and conducted in descending price order using the price as submitted in the Retirement De-List Bids. Bids with the same price will be reviewed in the order that produces the least negative impact to reliability. Where multiple bids have the same price and the retirement of the Existing Generating Capacity Resources would have the same impact to reliability, they will be reviewed based on their submission time. If bids with the same price are from a single generating station, they will be reviewed in an order that seeks to provide (1) the least-cost solution under Section III.13.2.5.2.5.1(d), and (2) the minimum aggregate quantity required for reliability from the generating station. … .

Section III.13.2.5.2.5A(d) also addresses the relationship between reviews for fuel security reliability and reviews for other reliability reasons under existing Section III.13.2.5.2.5, explaining that the fuel security reliability review is conducted first. As noted above, these reviews are conducted in the early spring. Reliability reviews pursuant to Section III.13.2.5.2.5 for NERC, NPCC or other ISO reliability criteria are conducted in mid-summer. Section III.13.2.5.2.5A(d) continues and states that, in cases where a retiring Existing Generating Resource is needed for both fuel security reliability reasons and another reliability reason pursuant to the existing Section III.13.2.5.2.5, the fuel security reliability determination will govern for purposes of cost allocation. The section provides:

> …An Existing Generating Capacity Resource may be needed for both fuel security and for transmission security pursuant to Section III.13.2.5.2.5. The fuel security reliability review will be performed in advance of the reliability review for transmission security. Where an Existing Generating Capacity Resource is needed for both fuel security reasons pursuant to this Section III.13.2.5.2.5A, and transmission security reliability reasons pursuant to Section III.13.2.5.2.5, the generator will be retained for fuel security for purposes of cost allocation.

Where a resource is needed for fuel security reliability reasons, the resource is retained (that is: has its retirement de-list bid rejected) for that reason. Because, as Mr. Brandien explained in the Waiver Petition filing, fuel security is a basic system operating requirement that affects the entire region, the ISO's determination is that fuel security should be the governing cost allocator, even if additional study[70] shows other more localized issues that could arise with the retirement of the generation. In other words, a resource has its Retirement De-List Bid rejected for fuel security reasons although the loss of the resource may give rise to other issues.

5. Participation in Annual Reconfiguration Auctions and Monthly Reconfiguration Auctions and Bilateral Contracts

Section III.13.2.5.2.5A(e) describes the ineligibility of resources that are identified as being needed for fuel security reasons to participate in Annual Reconfiguration Auctions and monthly reconfiguration auctions and in monthly bilateral transactions. This provision is similar to the prohibition in the existing Section III.13.2.5.2.5(g) on participation in the Annual Reconfiguration Auctions. However, unlike Section III.13.2.5.2.5(g), Section III.13.2.5.2.5A(e) prohibits participation in monthly auctions and bilateral transactions by retained resources for the months of December, January, and February.

The section provides:

> (e) If an Existing Generating Capacity Resource is identified as being needed for fuel security reasons, and the reliability need is not met through a reconfiguration auction or other means, that resource, or portion thereof, as applicable may not participate in Annual Reconfiguration Auctions for the Capacity Commitment Period(s) for which it is needed for fuel security, or earlier 2022/23, 2023/24 and 2024/25 Capacity Commitment Periods. Such an Existing Generating Capacity Resource that is identified as being needed for fuel security may participate in monthly bilateral transactions and monthly reconfiguration auctions, but may not submit monthly bilateral transactions for December, January or February, or

[70] Where a resource has been identified as needed for fuel security reasons, the high-level review for impacts on transmission security is still performed later in the year for informational purposes. That is not a planning Needs Assessment. The actual, specific system needs are identified through the Needs Assessment study process that is conducted in the regional system planning process. Needs Assessments are updated to remove generation from the base case whenever a retirement is submitted pursuant to Attachment K of the ISO Open Access Transmission Tariff, Section II of the Tariff. *See* Sections 4.1(a)(iii) and 4.1(c)(ii) of Attachment K to Section II of the ISO Tariff.

demand bids for the December, January, or February monthly reconfiguration auctions for any period for which they have been identified as being needed for fuel security.

Note that the effect of having a demand bid rejected in a reconfiguration auction is a block on the trade of a Capacity Supply Obligation (*i.e.*, the shedding of the Capacity Supply Obligation) from the Existing Generation Resource submitting the demand bid. No special compensation eligibility arises from the rejection of a demand bid. Rather, the exiting resource simply retains the Capacity Supply Obligation and the payment associated with the acquisition of the Capacity Supply Obligation.

6. Notification of Participant Submitting Retirement De-List Bid or Demand Bid

Section III.13.2.5.2.5A(f) sets out the parameters of when notification will occur to Participants from the ISO regarding the results of a fuel security reliability review. In short, for Retirement De-List Bids, which are submitted by the Existing Capacity Retirement Deadline each spring, the participant will be notified if the resource is needed for fuel security reliability reasons within 90-days of that retirement submission deadline. This notification therefore occurs before any additional review for reliability impacts is performed under the existing Section III.13.2.5.2.5.

In the case of substitution auction demand bids, which function as another path to retirement, and which do not require the submission of a Retirement De-List Bid, a participant that has its demand bid rejected will be notified after the relevant FCA has been completed.

The provision states:

> (f) Participants that have submitted a Retirement De-List Bid will be notified by ISO New England if their resource is needed for fuel security reliability reasons no later than 90 days after the Existing Capacity Retirement Deadline. Participants that have submitted a substitution auction demand bid, and where the demand bid has been rejected for reliability reasons, will be notified after the relevant Forward Capacity Auction has been completed.

Note that the effect of having a demand bid rejected in the substitution auction is a block on the trade of Capacity Supply Obligation between the Existing Generating Resource submitting the demand bid and a state sponsored resource submitting the replacement supply bid. No special compensation eligibility arises from the rejection of a demand bid in a substitution auction. The existing resource simply retains the Capacity Supply Obligation it acquired in the Forward Capacity Auction.

7. Retirement De-Lists Bids Needed for Fuel Security That Would Otherwise Clear the FCA

Section III.13.2.5.2.5A(g) provides that, where a Retirement De-List Bid or substitution demand bid would otherwise clear the FCA but is needed for fuel security reliability reasons, then the Retirement De-List Bid will not clear in the FCA and a demand bid for the resource will not be included in the substitution auction. This is accomplished through a cross reference to the currently effective provision for other reliability reviews in Section III.13.2.5.2.5(g). Section III.13.2.5.2.5A(g) provides:

> (g) Where a Retirement De-List Bid would otherwise clear in the Forward Capacity Auction, but the ISO has determined that some or all of the capacity associated with the de-list bid is needed for fuel security reliability reasons, the provisions of III.13.2.5.2.5(b) shall apply.

Existing Section III.13.2.5.2.5(b) states:

> (b) If a Retirement De-List Bid, Permanent De-List Bid, Static De-List Bid, Export Bid, Administrative Export De-List Bid, or Dynamic De-List Bid would otherwise clear in the Forward Capacity Auction, but the ISO has determined that some or all of the capacity associated with the de-list bid is needed for reliability reasons, then the de-list bid having capacity needed for reliability will not clear in the Forward Capacity Auction. If the ISO has determined that some or all of the capacity associated with a demand bid is needed for reliability reasons, then the entire demand bid will not be included in the substitution auction.

8. Compensation for Resources Retained for Fuel Security Reasons and Cost Allocation; Treatment of Resources with Cost-of-Service Agreements in the FCA

Section III.13.2.5.2.5A(h) sets out the provisions regarding compensation for resources retained for fuel security reliability reasons. In general, the provision provides that resources that are needed for fuel security reliability reasons are compensated in the same manner as resources retained for other reliability reasons, utilizing the Commission-approved provisions set out in Section III.13.2.5.2.5.1. Significantly, the existing compensation provision does not require the use of a cost-of-service agreement. Rather, like all resources retained for reliability reasons, resources retained for fuel security reasons may opt to receive their Retirement De-List Bid price, as reviewed and approved by the IMM, in lieu of pursuing a cost-of-service contract. This approach provides compensation that aligns with the resource's stated price to provide its generation

services without the risk, expense and burden of commencing the full rate case required for the approval of a cost-of-service agreement[71] at the Commission.

While new Section III.13.2.5.2.5A(h) points to the cost treatment for a resource retained for reliability under the existing Section III.13.2.5.2.5.1, it also specifies where the treatment for resources retained for fuel security reliability reasons differs. Specifically, Section III.13.2.5.2.5A(h) directs that the cost allocation for resources retained for fuel security that elect a cost-of-service agreement (instead of their approved de-list bid price), will be allocated to Real-Time Load Obligation, with certain exclusions, on a regional basis, allocated and collected over a 12-month period. This cost allocation is discussed at greater length in part III.B of this transmittal letter.

Finally, Section III.13.2.5.2.5A(h) sets out how Existing Generating Resources are treated in the FCA by cross-referencing to existing Tariff provisions on this topic. The effect of these provisions is to treat a retiring Existing Generating Resource that is retained for fuel security and elects a cost-of-service agreement as a price taker in the FCA. The existing cross-referenced provisions implement the Commission-approved price treatment for resources retained for violations of NERC, NPCC or other ISO reliability criteria. The reasons for this treatment are described in part III.C of this transmittal letter and in the supporting testimony of Dr. Geissler.

Section III.13.2.5.2.5A(h) provides:

> (h) Existing Generating Capacity Resources that have had their Retirement De-list Bid rejected for fuel security reliability reasons and that do not elect to unconditionally or conditionally retire shall be eligible for compensation pursuant to Section III.13.2.5.2.5.1, except that the difference between payments based on resource de-list bids or cost-of-service compensation as detailed in Section III.13.2.5.2.5.1 and payments based on the Capacity Clearing Price for the Forward Capacity Market under this Section III.13.2.5.2.5.1 shall be allocated on a regional basis to Real-Time Load Obligation, excluding Real-Time Load Obligation associated with Dispatchable Asset Related Demand Resources (DARD Pumps and other electric storage based DARDs) and Real-Time Load Obligation associated with Coordinated External Transactions, allocated and collected over a 12 month period. Resources that that are identified as needed for fuel security reliability reasons will have their capacity entered into the Forward Capacity Auction pursuant to III.13.2.5.2.5(g) and III.13.2.3.2(b).

[71] Like resources retained for other reliability reasons, if a cost-of-service agreement option is selected, the *pro forma* agreement contained at Appendix I of Section III to the Tariff. Any resource specific revisions to that *pro forma* are filed by the generator seeking the agreement for review and approval by the Commission through a Federal Power Act Section 205 rate case.

9. Limit on the Term of Cost-of-Service Agreements

Section III.13.2.5.2.5A(i) sets out limits on the total term of a cost-of-service agreement where that option is elected by a retiring Existing Generating Resource.[72] The provision establishes a maximum cumulative term available to a resource retained for fuel security reliability reasons of two years, inclusive of any evergreen renewals, for resources retained in the FCA 13 and FCA 14 cycles. For resources retained for fuel security reasons in the FCA 15 cycle, this provision specifies that a cost-of-service agreement may not exceed a total of one year.

Section III.13.2.5.2.5A(i) states:

> (i) Where an Existing Generating Capacity Resource elects a cost-of-service agreement pursuant to Section III.13.2.5.2.5.1 to address a fuel security reliability need, the term of such a cost-of-service agreement may not exceed two years, including renewal through evergreen provisions. A cost-of-service agreement entered into for the 2024/2025 Capacity Commitment Period shall be limited to a total duration of one year.

10. Annual Reevaluation of Fuel Security Reliability Need

Section III.13.2.5.2.5A(j) provides for an annual reevaluation of need to be performed by the ISO. Similar to the reevaluation for a resource retained for another reliability reason under Section III.13.2.5.2.5, this provision ensures that resources retained for reliability for fuel security purposes are not held longer than is needed. Again, mirroring the Commission-approved process for resources retained for other reliability reasons, once the fuel security reliability need has been resolved, and if the resource is not needed for another reliability reason, the resource will be retired from the system.

> (j) The ISO shall perform an annual reevaluation of any Existing Generating Capacity Resources retained for reliability under this provision. If a resource associated with a Retirement De-List Bid that was rejected for reliability reasons pursuant to this section, is found to no longer be needed for fuel security, and is not needed for another reliability reason pursuant to Section III.13.2.5.2.5, the resource will be retired from the system as described in Section III.13.2.5.2.5.3(a)(1). In no case will a resource retained for fuel security be retained for fuel security beyond June 1, 2025.

Section III.13.2.5.2.5A(j) concludes with a statement that a resource may not be retained for fuel security reasons beyond June 1, 2025. This limitation is intended, like the language noted in Section III.13.2.5.2.5(i), to make clear that any retention of

[72] This provision aligns with the Commission's direction in the July 2 Order to provide for a "short-term" cost-of-service agreement option. *See* July 2 Order at PP 2, 55.

resources for fuel security should not extend beyond the effective period of these provisions.

11. Review of Fuel Security Reliability Reviews with Stakeholder Committee

Section III.13.2.5.2.5A(k) incorporates the same stakeholder review process used for other reliability reviews. That section states:

> (k) The ISO will review Retirement De-List Bids rejected for fuel security reliability reasons with the Reliability Committee in the same manner as described in Section III.13.2.5.2.5(h).

12. Additional Informational Requirement for all Cost-of-Service Agreements

Outside of the new Section III.13.2.5.2.5A and the new, related Appendix L, one revision to another Section III provision was proposed and accepted during the stakeholder process. The provision, set out below, adds a new subsection (e) to existing Section III.13.2.5.2.5.1.

> (e) If ISO-NE is a party to a cost-of-service agreement filed after January 1, 2019 that changes any resource performance-related obligations contained in Section III, Appendix I (provided that those obligations are different than the obligations of an Existing Generating Capacity Resource with a Capacity Supply Obligation), no later than 30 days after such agreement is filed with the Commission, ISO-NE shall provide to stakeholders quantitative and qualitative information on the need for, and the impacts of, the proposed changes.

The provision requires the ISO to identify the rationale for and the costs of enhanced performance obligations. The ISO will use public market data to make this quantitative and qualitative assessment.

IV. Description of Stakeholder Review

Building on the review of the OFSA discussed in the Waiver Petition, the ISO began discussion with stakeholders in May of 2018 to discuss the criteria and trigger that would be used to identify resources needed for fuel security reliability reasons. While these discussions were occurring, the Commission issued its July 2 Order. The ISO accelerated discussions with stakeholders to not only review and refine study and trigger criteria, but also to develop the implementing Tariff provisions described above.

In all, a total of seven meetings were had with the NEPOOL Reliability Committee regarding the review criteria and triggering standard. A further five meetings were held with the NEPOOL Markets Committee to discuss implementing Tariff provisions, the proposed cost allocation, and price treatment of retained resources in the

FCA. While several refinements resulted from these discussions, the substance of this filing was not supported in votes of the Reliability Committee, Markets Committee and the NEPOOL Participants Committee.

V. Contents of this Filing and Requested Effective Date

This filing contains:

- This transmittal letter
- The Testimony of Peter Brandien, Exhibit ISO-1
- The Testimony of Christopher Geissler, Exhibit ISO-2
- Blackline Tariff revisions adding Sections III.13.2.5.2.5A and III.13.2.5.2.5.1(e) to the ISO Tariff, Exhibit ISO-3
- Clean Tariff revisions of Sections III.13.2.5.2.5A, III.13.2.5.2.5.1(e), and the Appendix L to Section III of the Tariff, Exhibit ISO-4
- Planning Procedure No. 10, Appendix I in support of this filing for informational purposes, Exhibit ISO-5
- Certificate of Service pursuant to 18 C.F.R. § 385.2010

The ISO respectfully requests that the Commission accept this compliance filing to be effective 60 days from the date of filing, on October 30, 2018.

VI. Conclusion

For the reasons set out above, and as supported in the testimony of Mr. Brandien and Dr. Geissler, the ISO requests that the Commission accept the proposed Tariff revisions submitted with this filing in compliance with the July 2 Order.

Respectfully submitted,

/s/ Theodore J. Paradise
Theodore J. Paradise
Assistant General Counsel,
Operations & Planning
ISO New England Inc.

Dated: August 31, 2018

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc.) Docket No. EL18-182-000

TESTIMONY OF PETER BRANDIEN
ON BEHALF OF ISO NEW ENGLAND INC.

I. WITNESS IDENTIFICATION

Q: Please state your name, title and business address.

A: My name is Peter Brandien. I am employed by ISO New England Inc. (the "ISO") as the Vice President of System Operations. My business address is One Sullivan Road, Holyoke, Massachusetts 01040.

Q: Please describe your educational background and work experience.

A: I have a Bachelor of Science degree in Electrical Engineering from the University of Hartford. I have more than 31 years of energy industry experience in control room operations. In 2004, I joined the ISO as the Vice President of System Operations. In that capacity, I am responsible for the day-to-day operations of New England's bulk electric system and oversight of transaction management, transmission technical studies, outage coordination, unit commitment, economic dispatch, system restoration, operator training, certain compliance functions and development of operating procedures. Prior to joining the ISO, I spent 17 years at Northeast Utilities, most recently as director of transmission operations. Before joining Northeast Utilities, I served in the United States Navy as a submarine nuclear propulsion plant operator/electrician.

II. PURPOSE AND ORGANIZATION OF TESTIMONY

Q: What is the purpose and organization of your testimony?

A: The Federal Energy Regulatory Commission (the "Commission") found in the order it issued on July 2, 2018 in Docket No. ER18-1509-000 that both the methodology and assumptions used for the Operational Fuel Security Analysis ("OFSA")[1] and the similar follow-up studies done just for Mystic units 8 and 9 in eastern Massachusetts ("Mystic Retirement Studies") were reasonable.[2] However, the Commission also stated that the absence in the ISO Tariff[3] of the ability to retain a resource for fuel security reliability reasons appeared to render the Tariff unjust and unreasonable.[4] To address this, the ISO has developed a reliability criteria for fuel security that is based on the OFSA and Mystic Retirement Studies assumptions and methodology, and proposed generically applicable provisions in the ISO Tariff so that the criteria will applied to all retirements, similar to any other NERC, NPCC or ISO-NE reliability criteria review.[5]

[1] *Operational Fuel-Security Analysis*, ISO New England Inc. (Jan. 17, 2018), https://www.iso-ne.com/static-assets/documents/2018/01/20180117_operational_fuel-security_analysis.pdf. The OFSA was discussed in detail in the ISO's May 1, 2018 *Petition of ISO New England Inc. for Waiver of Tariff Provisions* in Docket No. ER18-1509-000 ("Waiver Petition"), and the testimony of Peter Brandien that accompanied that submission. *See* Testimony of Peter T. Brandien on Behalf of ISO New England Inc., Petition for Waiver, May 1, 2015 in Docket No. ER15-1509-000 ("Waiver Testimony").
[2] *See ISO New England Inc.*, 164 FERC ¶ 61,003 at PP 49-52 (2018) ("July 2 Order"). The July 2 Order instituted the current compliance proceeding in Docket No. EL18-182-000.
[3] Capitalized terms used but not defined in this testimony are intended to have the meaning given to such terms in the ISO New England Inc. Transmission, Markets and Services Tariff ("Tariff").
[4] *See* July 2 Order at PP 2, 49.
[5] *See* Section III.13.2.5.2.5 of the Tariff.

While very similar to the OFSA and Mystic Retirement Studies, which I described in my Waiver Testimony,[6] the ISO has made further refinements to the assumptions for the generically applicable reliability review.

The purpose of my testimony in this proceeding is to describe what those changes are and why they were made, as well as to describe the criteria that the ISO has developed to identify when a resource is needed for fuel security reliability reasons. In order to do that, I will describe the new Tariff Section III.13.2.5.2.5A, which follows the current Commission-approved Section III.13.2.5.2.5 that allows a resource to be retained for reliability when its loss would violate NERC, NPCC or ISO-NE reliability criteria. The new Section III.13.2.5.2.5A creates the same framework for a reliability review and retention, if needed, but for fuel security. I also describe the new Appendix L to Section III of the Tariff where the ISO New England fuel security reliability standard, *i.e.* the criteria, is set out.

Like any reliability standard, testing for violations is done through the use of assumptions and methodology that sit outside the reliability standard or the Tariff. The assumptions that the ISO has set out are in a new Appendix I to

[6] *See, e.g.*, Waiver Testimony at pp. 18-26, 30-34, 37-47.

Planning Procedure No. 10 ("PP-10") and are codified at a sub-tariff level.[7] Similar to other reliability standards assumptions and methodologies, this document is updated regularly with new data as new information, *e.g.*, load levels, observed generator behavior, etc., becomes available. As I describe the assumptions and methodologies, I will highlight differences from those that the Commission already found to be reasonable based on the OFSA and Mystic Retirement Studies.[8]

In terms of organization, I will review the fuel security reliability review methodology, including the 18 pre-defined scenario cases, the static and variable input assumptions – highlighting where changes have been made from the prior studies, and then I will walk through how the methodology and assumptions are applied. Next, I review the trigger criteria and why it was selected and how it compares to what was used in the Mystic Retirement Studies. Finally, although the Commission found that the Mystic units 8 and 9 should be retained for reliability purposes for the thirteenth Forward Capacity Auction ("FCA 13"),[9] I review the results of applying the updated fuel security reliability review criteria to those units.

[7] A copy of PP-10 is included as Exhibit ISO-5 of this filing for informational purposes.
[8] *See* July 2 Order at P 49 "We find ISO-NE's methodology and assumptions in the OFSA and Mystic Retirement Studies reasonable and accept ISO-NE's conclusions that the retirement of Mystic 8 and 9, under current ISO-NE Tariff provisions, could cause ISO-NE to violate mandatory reliability standards as soon as 2022." *See also, Id.* at PP 50-51.
[9] *See* July 2 Order at P 49.

III. TESTIMONY

A. INTRODUCTION REGARDING NEED FOR RELIBILITY REVIEW

Q: Can you explain the fuel security need warranting the proposed reliability review?

A: New England's fuel security challenges – that is, the possibility that resources in the region's generation fleet will not have, or be able to obtain, the fuel they need to produce the power required to meet system demand and maintain required reserves, particularly during extended periods of cold weather or other system-stressed conditions – are detailed in my testimony in support of the ISO's May 1, 2018 Waiver Petition and incorporated herein by reference for efficiency.[10] In its July 2 Order, the Commission determined that the fuel security issue poses a risk to reliability in the region, and because the ISO Tariff does not have a means to currently review and retain resources for fuel security reliability reasons, further determined that the Tariff may be unjust and unreasonable.[11] As noted, the Commission found in its July 2 Order that the methodology and assumptions of the OFSA and Mystic Retirement Studies are reasonable.[12] In response to the Commission's directive to establish generally

[10] *See* Waiver Testimony1 at pp. 5-13.
[11] July 2 Order at P 55.
[12] July 2 Order at PP 49-52.

applicable provisions, the OFSA and Mystic Retirement Studies assumptions and methodology have been reviewed and further refined to be used in the review of all Retirement De-List Bids as described in this testimony.

B. THE FUEL SECURITY RELIABILITY REVIEW METHODOLOGY AND ASSUMPTIONS

Q: What is the fuel security reliability review?

A: The fuel security reliability review is the analysis the ISO will perform pursuant to proposed Section III.13.2.5.2.5A(c) and PP-10 to examine the regional power system reliability impacts of the loss of an Existing Generating Capacity Resource that is seeking to retire.

Q: Can you describe, at a high level, the fuel security reliability review methodology?

A: Yes. At a high level, the fuel security reliability review is a 90-day winter energy analysis that builds on the methodology and assumptions developed for the OFSA,[13] and used in the subsequent studies of the retirements of Exelon Corporation's Mystic units 8 and 9 generating facility for the Mystic Retirement Studies.[14] The fuel security reliability review builds from these previously-

[13] *Operational Fuel-Security Analysis*, ISO New England Inc. (Jan. 17, 2018), https://www.iso-ne.com/static-assets/documents/2018/01/20180117_operational_fuel-security_analysis.pdf.
[14] *See* Waiver Testimony at 19-26; 30-45.

performed fuel security analyses in that it employs largely the same methodology and set of assumptions in the OFSA and the Mystic Retirement Studies. As noted above, the Commission found this methodology reasonable and the set of assumptions rational in the order issued on July 2, 2018, in this proceeding.[15]

Using the same underlying model developed for the OFSA, the fuel security reliability review is designed to examine an entire 90-day winter season (December, January, and February) using a predefined range of scenarios, similar to those in the Mystic Retirement Studies, to assess the operational impacts presented by the retirement of an Existing Generating Capacity Resource. For each scenario, the fuel security reliability review will measure the effects or operational impacts of the loss of the Existing Generating Capacity Resource throughout the applicable 90-day winter period and using the same operational metrics applied in the OFSA and Mystic Retirement Studies. These operational metrics are the full utilization of Operating Procedure No. 4, Actions During a Capacity Deficiency ("OP-4"), and Operating Procedure No. 7, Action in an Emergency ("OP-7"). OP-4 and OP-7, described in the Waiver Testimony,[16] are the procedures the ISO follows when insufficient energy is available to meet total expected electricity demand while maintaining operating reserves to meet mandatory reliability requirements.[17] The results of the fuel

[15] July 2 Order at PP 49-52.
[16] Waiver Testimony at pp. 22-23.
[17] *See* Waiver Testimony at 22-23.

security reliability review will then be measured against the trigger criteria established in Appendix L of Section III of the Tariff, which I describe later in this testimony.

Q: What are the predefined scenarios that will be used in the fuel security reliability analysis?

A: Like in the Mystic Retirement Studies, the fuel security reliability review will evaluate the operational impacts using pre-defined scenarios designed to test the system response without the availability of the retiring Existing Generating Capacity Resource against a range of sensitivities. The predefined scenario cases consist of three LNG-supply cases, each comprising six different scenarios, for a total of 18 scenario cases. The LNG-supply cases represent different maximum levels of daily LNG injections, and each scenario within an LNG-supply case accounts for varying levels of electricity imports and dual-fuel inventories. The amounts considered for each of these variable inputs are described below.

LNG in Bcf	Tie-line Import in MW	Dual Fuel Inventory (number of times replenished)
0.8	2800	1.25
0.8	3000	1.25
0.8	3500	1.25
0.8	2800	2
0.8	3000	2
0.8	3500	2
1	2800	1.25
1	3000	1.25
1	3500	1.25
1	2800	2
1	3000	2
1	3500	2
1.2	2800	1.25
1.2	3000	1.25
1.2	3500	1.25
1.2	2800	2
1.2	3000	2
1.2	3500	2

Q: What changes, if any, have been made to the model, methodology, or assumptions used in the OFSA and Mystic Retirement Studies for the fuel security reliability reviews?

A: While the methodology and assumptions are largely the same used within the OFSA and Mystic Retirement Studies, certain adjustments have been made since the springtime. For the reasons I will describe, individually and collectively,

these adjustments have the effect of increasing the assumption of energy available, *i.e.*, making the reliability review more optimistic.

Q: How are the static input assumptions being adjusted?

A: For the fuel security reliability reviews, the values assigned to some of the static input assumptions will be adjusted to correspond to the applicable year being analyzed. For example, as in the OFSA and Mystic Retirement Studies, the electricity demand for scenarios will be based on the 2014-2015 90-day winter electricity demand as adjusted to reflect the 90/10 peak load forecast, net of projected Energy Efficiency, based on the latest (most recent) Capacity, Energy, Loads, and Transmission Report ("CELT Report") for the winter period of the year being analyzed. To illustrate, fuel security reliability reviews for the winter associated with Capacity Commitment Period 2022-2023, which correlates to FCA13, would use 20,342 MW (net peak load) found in the 2018 CELT Report, versus the 2014-2015 actual peak of 20,567 MW.

Certain static input assumptions are also being adjusted to reflect new or updated data. Specifically:

- Natural Gas Supply: The amount of natural gas available for electric generation is one of the key study assumptions. Like the previously-performed fuel security analyses, the fuel security reliability reviews will assume local gas utilities' demand would be satisfied first, and the remaining natural gas pipeline capacity and LNG injections would be utilized for

electricity generation. For the fuel security reliability reviews, the methodology for deriving the local distribution company ("LDC") gas demand and the maximum daily amount of gas that would be available to the electric power sector will be the same as that used in the OFSA and Mystic Retirement Studies. However, for the fuel security reliability reviews, the ISO will be using updated heating degree days temperature curves for estimating LDC gas demand. In addition, the ISO will be using updated vendor-supplied data annually on the sources of gas supply – the natural pipeline supply (*i.e.*, Algonquin, Tennessee, Iroquois, and Portland Natural Gas Transmission System from the west, and Sable Island and Deep Panuke from the east); satellite LNG facilities used to support LDC behind-the-meter operations; and pipeline-connected LNG (i.e., Canaport, Distrigas, and the Excelerate off-shore buoy).

- Natural Gas Demand: The LDC demand modeled for the applicable year being analyzed will be held constant for analyses performed for the fourteenth Forward Capacity Auction ("FCA 14") (2023-2024), and the fifteenth Forward Capacity Auction ("FCA 15") (2024-2025), instead of using the annual growth estimates in the 2016 study conducted by ICF International, Inc. for the ISO.[18] This adjustment is based on the assumption that any growth in future forecasted LDC demand will be offset by an equivalent amount of increased supply. This increase in supply could come

[18] ICF International, *New England LDC Gas Demand Forecast Through 2030*, PAC presentation (December 14, 2016), https://www.iso-ne.com/static-assets/documents/2016/12/iso-ne.ldc-demand-forecast-03-oct-2016.pdf.

from a variety of sources; such as, LNG contracts, peak shaving facilities, or incremental expansions to infrastructure. This is a change from the OFSA and Mystic Retirement Studies which both accounted for growth of demand, but fixed natural gas supply out only as far as petitions for new projects had been filed. The net effect of this adjustment is to assume that more gas will be available past 2023.

- Resources Available for Dispatch:
  - Renewables: In the fuel security reliability review, input assumptions relating to resource available for dispatch will be adjusted to reflect updated data. For example, as in the case of the previously-performed OFSA and Mystic Retirement Studies, the fuel security reviews will account for renewables, including on- and off-shore wind, photovoltaic ("PV") (both behind-the-meter and commercial), and other renewables (*e.g.*, biomass, refuse) based on the most recently-published CELT Report. However, modeling for the PV forecast, on-shore wind, and off-shore will be adjusted to reflect hourly profiles based on the actual winter 2014-2015 weather. The PV and on-shore wind hourly profiles will be adjusted to reflect the expected performance of the fleet assumed in service in the study year, and the off-shore wind hourly profiles will be adjusted based on an hourly profile from the winter 2014-2015 weather, using data from National Renewable Energy Laboratory and NASA models to develop hourly wind speed data and corresponding capacity factors

based on the resource's winter turbine hub height for specific off-shore locations. In general, there tends to be a good correlation between wind generation output and extremely cold weather and therefore the use of hourly profiles results in a greater amount of energy production available for dispatch in the model when the gas system is constrained which would tend to show a reduced need for retention of a resource for fuel security reasons.

- State Contract Resources: In addition to reflecting Existing Generating Capacity Resources and energy-only resources at their Seasonal Claimed Capability based on the most-recently published CELT Report (and Qualified Capacity for non-commercial Existing Generating Capacity Resources), as well as forecasts of state energy efficiency ("EE") and PV investments over the study year periods, the fuel security reviews will differ from the previously-performed analyses in that the model will also reflect additional resources that are subject to a binding and enforceable contract under a state procurement. Specifically, the ISO will include in the model contracted resources that are expected to be in-service by the December 1 of the associated Capacity Commitment Period if information regarding such resources is made available to the ISO in time to allow for their consideration in the analysis. This change results in an increase in the energy available to the region for dispatch in the model. While even resources with approved contracts can be

delayed in siting and may miss operational target dates, the ISO believes this addition is a reasonable assumption that weighs risk of delay against the maturity of a given procurement, *i.e.*, that it has completed the contracting phase.

- Demand Response: Unlike the OFSA and the Mystic Retirement Studies, the fuel security reliability reviews will include active demand response resources at their Seasonal Claimed Capability reduction value as resources available for dispatch. In the OFSA, these resources were accounted for under OP-4 actions. However, as of June 1, 2018, these resources became integrated into New England's wholesale energy markets to be dispatched based on price in the same way generators are dispatched. The Mystic Retirement Studies did not reflect this change.

Q: What changes are being made to the variable input assumptions used in the previously-performed analyses?

A: Similar to the Mystic Retirement Studies, the only model input assumptions that will vary in the fuel security reliability reviews are: the amount of LNG injections, the amount of energy imports across the external ties, and the frequency of refilling dual-fuel oil tanks. For the fuel security reviews, these assumptions will be adjusted from the Mystic Retirement Studies as follows:

- LNG Injections: The fuel security reviews will only consider LNG injection levels of 0.8 Bcf/d, 1.0 Bcf/d, and 1.2 Bcf/d. These levels are consistent with

those considered in the Mystic Retirement Studies, except they exclude the incremental 0.9 and 1.1 cases.

- Electricity imports: The electricity import levels will be set at 2,800 MW, 3,000 MW, and 3,500 MW for every hour of the winter period of the year being analyzed. The only change from the Mystic Retirement Studies is an increase from the starting level of 2,500 MW. The 2,800 MW adjustment coincides with the higher imports observed during the 2017/2018 winter period during colder weather.

- Dual-Fuel Oil Tank Fill Rate: The fuel security reviews will assume oil storage tanks at dual-fuel generation facilities will refill a minimum of 1.25 and a maximum of 2.0 times their oil storage tanks levels. This is an increase to the minimum of one refill assumed in the Mystic Retirement Studies to reflect the several initiatives being developed ahead of the 2018-2019 winter period to provide improved market signals for incentivizing resource preparedness. These efforts include establishing energy alert thresholds in ISO Operating Procedure No. 21 by providing the region a three week look ahead analysis based on actual fuel inventories to allow for proactive responses in advance of an Energy Emergency declaration, and enhancing the current treatment of a resource's opportunity costs in the energy supply offers. Pay for Performance also went into effect on June 1, 2018 and should act to create incentives that support the ability of generators to operate during times of energy scarcity. Opportunity cost pricing is also being introduced

and will make it more attractive to hold less-expensive on-site fuel in reserve and operate on more expensive gas, allowing generators to better manager fuel inventories. While it is too soon to predict the impact these initiatives will have on the operations of the electric system, and how that may impact fuel availability and the dispatch order in the model, the ISO believes these refill levels are a reasonable proxy. Assuming an average dual-fuel tank of eight days, increasing the minimum to 1.25 refills, results in the equivalent of increasing energy production of the model fleet by about two additional days. If higher refill rate is observed, the ISO will update its refill assumptions in PP-10.

Q: How is the reliability review performed?

A: To perform a fuel security reliability review, the ISO starts with updating static inputs based upon the most recent CELT Report. These inputs from the CELT Report include: net 90/10 winter peak load, resource Seasonal Claimed Capability for all Existing Generating Capacity Resources, along with the removal of the resource submitting a Retirement Delist bid, and PV, On shore and Off shore wind nameplate capability, and Demand Response Resource Seasonal Claimed Capability. The ISO will utilize the most recent Equivalent Forced Outage Rate on Demand ("EFORd") and apply it to applicable technology classes. The ISO will also utilize the most recent NERC EFORd Capacity Factor Class Averages to apply to the conventional hydro-electric generation fleet. The ISO will select the study year to model the future year total

forecasted LDC gas demand as applied to the weather pattern from the winter of 2014/2015.

For the year of study, the ISO will update the pipeline capacity based upon vendor supplied information on infrastructure buildout. The ISO will update the oil-only inventory levels and resource specific oil reorder levels based upon the most recent December fuel surveys. The ISO will review and model, as applicable, all new resources contracted for under state request for proposals. The ISO will then select the appropriate values for the variable inputs of imports, LNG injections and dual-fuel resource tank inventory, producing the output metrics as shown in the table below on page 19 of my testimony. The output metrics would then be applied to the fuel security reliability standard to assess the retention of the resource submitting a Retirement Delist bid.

Q: Is that resource dispatch methodology the same as was used in the OFSA and Mystic Retirement Studies?

A: The dispatch methodology is essentially the same between the OFSA and Mystic Retirement Studies with the exception of the Demand Response Resources being removed from OP-4 actions and being dispatched prior to OP-4 actions in the resource dispatch stack. This dispatch methodology change does not impact the output metrics utilized by the reliability standard for fuel security for unit retention. The current dispatch methodology can be changed based upon observed winter resource dispatch as the ISO deems necessary, and the

information will be provided to the NEPOOL Reliability Committee.

Q: Once a resource is retained for fuel security reliability reasons, is there a reassessment at any point?

A: Yes. If a retiring resource is needed for fuel security reliability reasons, and chooses not to go ahead with the retirement, the new Tariff Section 13.2.5.2.5A(j) adds an annual review provision to reassess whether there have been changes to the system that address the identified fuel security need.

Q: Will that annual reassessment utilize the same methodology and assessment that you described earlier?

A: Yes, as updated with more current information for the various inputs, as I have described.

C. THE FUEL SECURITY RELIABILITY REVIEW TRIGGER CRITERIA

Q: How will the fuel security reliability reviews measure the effects on reliability of the retirement of an Existing Generating Capacity Resource from the Forward Capacity Market?

A: In the fuel security reliability reviews, the ISO will measure the operational impacts of the retirement of the Existing Generating Capacity Resource using the same operational metrics applied in the OFSA and Mystic Retirement Studies –

that is, full utilization of OP-4 actions, depletion of 10-minute operating reserves, and load shedding under OP-7. Like the previous analyses, in the fuel security review, as the system stress intensifies in each of the scenarios assessing the loss of an Existing Generating Capacity Resource, the study model will progress through the series of actions specified in OP-4, in sequence, from: those that have no impact on electricity service to consumers, including depleting 30-minute operating reserves and scheduling an additional emergency energy import transactions; to procedures that have minor public impacts, including voltage reductions and requests for voluntary conservation; and then to the depletion of 10-minute operating reserves after fully exhausting all OP-4 actions, and before finally resorting to load shedding under OP-7.

For each scenario, the fuel security reliability review will calculate the load affected during the non-emergency and emergency actions under OP-4, including: the number of hours, as well as the quantity of load relief obtained, during 30-minute operating reserves depletion under Action 1; the quantity of load relief obtained under Actions 2-5 and Actions 6-11; the number of hours, as well as the quantity of load relief obtained, during the depletion of 10-minute operating reserves, including, depletion of 10-minute reserves below 700 MW in any hour; and, the number of hours and days of load shedding, and the quantity of unserved load, during OP-7 emergency actions. The ISO will also provide the results in terms of hourly curves profiling the quantity of load affected during OP-4 and OP-7 actions across the applicable analyzed winter period.

To illustrate:

LNG	Imports	Dual-Fuel Resource Tank Inventory	OP-4 Action 1 MWh	OP-4 Action 1 Hours	OP-4 Action 2-5 MWh	OP-4 Action 6-11 MWh	10-Minute Reserve Depletion MWh	10-Minute Reserve Depletion Hours	10-Minute Reserve Depletion less than 700 MW in Hours	OP-7 Action: Load Shedding MWh	OP-7 Action: Load Shedding Hours	OP-7 Action: Load Shedding Individual Days
0.8	2800	1.25										
	3000	1.25										
	3500	1.25										
	2800	2										
	3000	2										
	3500	2										
1.0	2800	1.25										
	3000	1.25										
	3500	1.25										
	2800	2										
	3000	2										
	3500	2										
1.2	2800	1.25										
	3000	1.25										
	3500	1.25										
	2800	2										
	3000	2										
	3500	2										

Q: What is the threshold criteria for retaining an Existing Generating Capacity Resource for fuel security?

A: The ISO proposes to retain an Existing Generating Capacity Resource that seeks to retire when the results of the fuel security reliability analysis show either of the following:

(i) the depletion of 10-minute operating reserves below 700 MW in any hour in the absence of a contingency in more than one LNG-gas supply scenario case, *or*,

(ii) the use of load shedding in any hour under OP-7 in any one scenario.

This fuel security reliability review standard is set out in a new Appendix L to Section III of the Tariff.

Q: How does the proposed reliability trigger criteria compare to the threshold criteria applied in the previously-performed fuel security analysis?

A: The OFSA did not measure the results of the operational analyses against specific trigger criteria. In the Mystic Retirement Studies, the ISO considered: (i) the core NERC Balancing Standard requirement related to maintenance of Contingency Reserves, or as referred to in the NPCC areas "10-minute operating reserves;" and (ii) avoidance of load shedding. The fuel security reliability review standard is similar to the criteria applied in the Mystic Retirement Studies except that for the fuel security reviews, the ISO is allowing for depletion of up to fifty percent of the 10-minute operating reserves, which results in 700 MW of 10-minute operating reserves remaining pre-contingency.

Q: NERC's BAL-002-2 R2 requires that those short-term reserves be maintained in the absence of a contingency. Are there any contingencies in the fuel security reliability review?

A: No. The reliability review scenarios do not assume contingencies. That is why when we see these extremely stressed system conditions, as I described in my Waiver Testimony,[19] the forecast indicates that the pre-contingency state of the system is unacceptable.

[19] Waiver Testimony at pp. 40-47.

Q: How does allowing a 700-MW depletion of 10-minute operating reserves in the fuel security reliability review relate to NERC criteria in the operating year?

A: The ISO believes that its models inputs include several optimistic assumptions to balance against certain limitations, such as not modeling price-based market dynamics. As an example, the ISO has modeled LNG at much greater daily injections than has been historically observed. However, the ISO received a lot of feedback in the stakeholder process that it was still too conservative regarding the trigger criteria. We took a hard look at the operating reserves and determined that being more than one year out, we're trying to make a forecast that has uncertainty to it – how resources will react to the newer market incentives I discuss above, or to Commission enforcement actions regarding fuel procurement practices, etc.

Conversely, going into the operating year, we must have a system that can provide full reserves in the absence of a contingency. To be absolutely clear, the ISO will not violate NERC reliability criteria. The system operators are trained to shed load if required to protect the interconnection for the next contingency, and the ISO system operators will direct the New England transmission owners to execute that operation to maintain overall system reliability. There is some discussion in the stakeholder process that the ISO operators will simply ride reserves down to zero in real-world operation and would not shed load. If the

external transmission tie lines are loaded up, as is likely in these types of operating periods, and with the large contingencies in New England (there are multiple source losses in excess of 1300 MW), we will be required to shed the load necessary to create the operating reserve pre-contingency to protect the integrity of the interconnection.

Q: So the trigger criteria is designed to allow for improvements in system performance between the forecast year and the operating year and is not a indication that the ISO would allow insufficient 10-minute operating reserves?

A: Yes. It's a forecast of the future system and reflects a lot of feedback that the ISO has received about not discounting improvements in resource capability and reduced energy usage. Again, it is in no way an indication that the ISO would allow the system to use up its last remaining tools (*i.e.*, 10 minute reserves) pre-contingency before the ISO would take the steps necessary to protect the reliability of interconnection.

Q: What about assertions that the trigger criteria, even with the depletion of over half the 10-minute operating reserves, are too conservative? Why not allow the depletion of another 10 or 50 or 100 MW of operating reserves?

A: Certain stakeholders have expressed concern that the trigger will result in the ISO retaining resources that are one MW under the allowed depletion of 700 MW – 50 percent - of 10-minute operating reserve depletion. The ISO believes

that view looks at the issue the wrong way. When the system is forecast to be 700 MW deficient of 10-minute operating reserves – the trigger point – what that means is that we already don't have 1/3 of the capacity resources available to respond. Then on top of that, the system operators have gone through all of load relief actions of OP-4, which creates another significant portion of operating space on the system by making use of the depletion of 30-minute operating reserves (700 MW), additional emergency energy imports (500 MW), and public appeals (500 MW). At that point, I have limited if any options available other than implementing OP-7 load shedding. Rather than retaining a resource because we are 1 MW short, the region is thousands of MW short of the capability to produce energy and the ISO has exhausted its tools for redispatch.

D. REVIEW OF MYSTIC UNITS 8 AND 9 WITH REVISED FUEL SECURITY ASSUMPTIONS

Q: Did you utilize the revised assumptions that you just described to re-run the need analysis for Mystic units 8 and 9?

A: Yes. However, I note that the Commission already determined in their July 2 Order that Mystic units 8 and 9 are needed for reliability for FCA 13,[20] and that

[20] *See* July 2 Order at P 49, where the Commission states "We find ISO-NE's methodology and assumptions in the OFSA and Mystic Retirement Studies reasonable and accept ISO-NE's conclusions that the retirement of Mystic 8 and 9, under current ISO-NE Tariff provisions, could cause ISO- NE to violate mandatory reliability standards as soon as 2022."

issue is therefore no longer before the Commission. Nonetheless we did re-run the analysis to give the Commission a full sense of the difference the revised assumptions make.

Q: What were the results of that analysis?

A: The analysis continues to show a significant need and the loss of the Mystic units results in a clear violation of the criteria that I describe in this testimony. The results are showing the following table:

LNG	Imports	Dual-Fuel Resource Tank Inventory	OP-4 Action 1 MWh	OP-4 Action 1 Hours	OP-4 Action 2-5 MWh	OP-4 Action 6-11 MWh	10-Minute Reserve Depletion MWh	10-Minute Reserve Depletion Hours	10-Minute Reserve Depletion less than 700 MW in Hours	OP-7 Action: Load Shedding MWh	OP-7 Action: Load Shedding Hours	OP-7 Action: Load Shedding Individual Days
0.8	2800	1.25	223,378	359	121,719	88,578	143,343	149	80	49,291	51	11
	3000	1.25	191,453	318	99,726	70,768	114,888	117	65	35,707	40	10
	3500	1.25	127,404	228	61,488	43,595	74,496	74	42	17,249	20	6
	2800	2	125,703	214	60,932	44,621	72,326	73	39	21,799	25	6
	3000	2	102,914	181	51,562	36,193	58,427	63	32	15,186	17	6
	3500	2	62,527	109	27,392	19,614	29,642	35	14	4,609	8	3
1	2800	1.25	95,965	163	45,800	32,422	49,818	55	30	10,107	15	5
	3000	1.25	80,574	144	39,111	26,052	39,844	44	20	7,124	10	4
	3500	1.25	50,557	92	21,971	16,703	21,488	28	11	2,302	6	2
	2800	2	37,493	74	18,664	12,334	14,482	17	9	421	3	3
	3000	2	30,655	52	13,227	8,048	9,821	12	4	-	0	0
	3500	2	15,179	31	6,190	4,050	2,872	5	0	-	0	0
1.2	2800	1.25	30,300	56	14,255	8,648	9,485	13	6	564	2	2
	3000	1.25	25,362	45	11,364	5,994	6,722	10	2	-	0	0
	3500	1.25	13,198	25	4,964	3,637	1,462	4	0	-	0	0
	2800	2	7,079	14	2,396	763	-	0	0	-	0	0
	3000	2	5,378	11	1,766	53	-	0	0	-	0	0
	3500	2	874	3	-	-	-	0	0	-	0	0

The analysis shows that both of the triggers are exceeded over several different scenarios.

Q: Are there new state-contracted resources in that updated analysis?

A: No. While there are state procurement contracts for new off-shore wind resources pending, they have not yet been approved. Nevertheless, we went

ahead and ran the analysis with the wind included as a sensitivity to understand the impacts those resources will have on the identified fuel security need. These results are show in the table below.

LNG	Imports	Dual-Fuel Resource Tank Inventory	OP-4 Action 1 MWh	OP-4 Action 1 Hours	OP-4 Action 2-5 MWh	OP-4 Action 6-11 MWh	10-Minute Reserve Depletion MWh	10-Minute Reserve Depletion Hours	10-Minute Reserve Depletion less than 700 MW in Hours	OP-7 Action: Load Shedding MWh	OP-7 Action: Load Shedding Hours	OP-7 Action: Load Shedding Individual Days
0.8	2800	1.25	166,055	290	84,721	57,871	96,210	96	54	27,231	31	9
	3000	1.25	143,507	246	70,158	47,725	80,257	80	49	20,503	25	8
	3500	1.25	96,811	170	43,964	31,333	51,354	53	24	9,427	15	4
	2800	2	87,218	152	43,479	29,089	46,192	50	27	11,205	13	5
	3000	2	73,026	123	34,796	23,219	34,563	38	18	6,544	11	4
	3500	2	40,816	76	17,809	12,072	14,132	17	8	516	3	3
1	2800	1.25	69,907	128	31,518	21,902	30,771	35	18	5,497	8	3
	3000	1.25	57,182	105	25,492	17,933	25,686	28	14	3,989	7	3
	3500	1.25	31,470	59	14,537	10,834	11,725	16	4	1,376	3	2
	2800	2	22,875	45	8,569	5,862	5,324	9	2	-	0	0
	3000	2	17,065	35	7,173	4,727	3,859	7	1	-	0	0
	3500	2	7,484	15	3,039	1,097	388	1	0	-	0	0
1.2	2800	1.25	20,005	33	8,208	4,744	4,501	8	2	-	0	0
	3000	1.25	15,349	30	5,424	3,868	2,726	3	1	-	0	0
	3500	1.25	6,779	13	1,538	1,078	397	1	0	-	0	0
	2800	2	3,109	6	610	-	-	0	0	-	0	0
	3000	2	1,560	5	214	-	-	0	0	-	0	0
	3500	2	346	1	-	-	-	0	0	-	0	0

Q: Please summarize the results with the off-shore wind resources added to the analysis.

A: As noted in the table, above, there are still numerous violations of the trigger criteria across multiple scenarios.

Q: Does this conclude your testimony?

A: Yes it does.

DECLARATION

I declare under penalty of perjury that the foregoing Testimony of Peter Brandien on behalf of ISO New England Inc., is true and correct to the best of my knowledge, information, and belief.

Executed on: August 31, 2018

Peter Brandien

Peter Brandien

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc.) Docket No. EL18-182-000

TESTIMONY OF CHRISTOPHER GEISSLER
ON BEHALF OF ISO NEW ENGLAND INC.

I. WITNESS IDENTIFICATION

Q: Please state your name, position and business address.

A: My name is Christopher Geissler. I am an Economist for ISO New England Inc. ("ISO"). My business address is One Sullivan Road, Holyoke, Massachusetts 01040.

Q: Please describe your responsibilities, work experience and educational background.

A: My primary responsibilities include wholesale electricity market design and development, with an emphasis on the ISO's Forward Capacity Market.[1] I served as the project lead for the ISO's current capacity market demand curves. That filing was accepted by the Commission in 2016 in Docket No. ER16-1434,[2] and helped to align the region's procurement of capacity with its marginal reliability impact. I also served as the project lead for the ISO's Competitive Auctions with Sponsored

[1] Capitalized terms used but not defined in this testimony are intended to have the meaning given to such terms in the ISO New England Inc. Transmission, Markets and Services Tariff ("Tariff").
[2] *ISO New England Inc., et al.* 155 FERC ¶ 61,319 (2016).

Policy Resource ("CASPR") proposal. The CASPR Tariff changes introduced a substitution auction that helps to accommodate state-supported policy resources into the region's wholesale markets while maintaining competitively-based capacity prices. That filing was accepted by the Commission in 2018 in Docket No. ER18-619.[3]

I am an instructor for numerous market-related sections of the ISO's Wholesale Energy Markets courses for ISO staff and Market Participants. Prior to joining the ISO in 2013, I received an M.A. and Ph.D. in Economics from Duke University, where I conducted research on competition in regulated industries.

Q: What role did you play in the ISO's determination of how resources retained for fuel security would be treated in the Forward Capacity Market?

A: I served as the ISO's lead economist evaluating the price treatment of resources retained for fuel security in the Forward Capacity Market ("FCM"). In that capacity, I worked with a team of engineers, economists, and attorneys at the ISO to analyze alternatives, evaluate their pros and cons, and develop a final recommendation on this issue, which is being submitted in this filing and is described in detail in this testimony. Furthermore, I led the ISO's engagement with its stakeholders on this specific issue during the meetings in which the ISO's

[3] *ISO New England Inc.*, 162 FERC ¶ 61,205 (2018).

proposal and alternatives were discussed. These meetings occurred in July and August of 2018.

II. PURPOSE AND ORGANIZATION OF TESTIMONY

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to explain the rationale for ISO's proposal to treat resources retained for fuel security as price-takers in the Forward Capacity Auction ("FCA").

Q: Please provide a high-level overview of the rationale for the ISO's proposal to treat resources retained for fuel security as price-takers in the FCA.

A: By treating resources retained for fuel security as price-takers, the ISO's proposal considers the contribution to resource adequacy of these resources when determining Capacity Supply Obligation ("CSO") awards and setting the FCA clearing price. This treatment will prevent the region from procuring more resources than are needed to meet its resource adequacy objectives. Such over-procurement would represent a costly and inefficient outcome. Additionally, this treatment ensures that the capacity clearing price in the FCA will be set based on capacity's marginal reliability impact ("MRI"), consistent with the purpose and benefit of the region's MRI-based capacity demand curves.

Q: How is your testimony organized?

A: Following this introductory section, the testimony is organized as follows:

- Section III explains how the two concepts discussed as possibilities by the Commission in its July 2nd Order,[4] where resources retained for fuel security are removed from the FCA or entered at their mitigated bid price, could lead the region to procure excess resources and produce prices that are inconsistent with capacity's marginal reliability value. Because of these concerns, the ISO is not adopting either concept.
- Section IV discusses the ISO's proposed treatment, where resources retained for fuel security are treated as price-takers in the FCA. This proposed treatment resolves the concerns surrounding over-procurement and capacity pricing inconsistencies that would result under either of the concepts proffered in the July 2nd Order.
- Section V addresses concerns surrounding "price suppression" in this context, and explains why the ISO's proposed treatment does not suppress capacity prices for resources awarded CSOs solely for their contribution to New England's resource adequacy requirements.
- Finally, Section VI outlines alternate treatments considered by the ISO and stakeholders, and why each was not pursued in the instant filing.

[4] *See ISO New England Inc.*, 164 FERC ¶ 61,003 at PP 49-52 (2018) ("July 2 Order").

III. THE CONCEPTS PROFFERED BY THE COMMISSION WOULD LEAD TO EXCESS RESOURCES AND SET CAPACITY PRICES SUCH THAT THEY ARE NOT CONSISTENT WITH CAPACITY'S MARGINAL RELIABILITY IMPACT

Q: What were the concepts noted by the Commission in the July 2nd Order as possibilities for the price treatment of a resource retained in the FCA for fuel security?

A: The Commission's Order included two concepts for the ISO to consider as it evaluates how to treat resources retained for fuel security in the FCA. Under concept 1, a retained resource would be removed entirely from the FCA. More specifically, the Order states that "… Tariff revisions could allow ISO-NE to retain a resource retained for fuel security outside of the FCM construct."[5]

Concept 2 would not remove the resource from the FCA, but instead would bid the resource's capacity in the FCA at the competitive price as determined by the Internal Market Monitor ("IMM") and approved by the Commission. More specifically, the Order notes that "it may be reasonable for resources retained for fuel security purposes to be offered into the FCM at an offer price that is above zero, but still subject to mitigation by the IMM."[6]

Q: Is a retained resource's contribution to resource adequacy considered when clearing the FCA under each of these concepts?

A: Under concept 1, its contribution is not considered. The resource does not participate in the FCA, and as a result, its contribution to resource adequacy is not

[5] July 2 Order at P 56.
[6] *Id*. at P 57.

accounted for in determining CSO awards or setting capacity clearing prices.

Under concept 2, its contribution will be considered if the resource retained for fuel security has a bid price (as mitigated, if applicable) that results in it acquiring a CSO in the FCA. However, like concept 1, its contribution will not be considered if the resource's bid price (as mitigated, if applicable) exceeds the FCA clearing price and it is not awarded a CSO in the auction.

Q: Can you provide an example where the concepts proffered would not count a retained resource's contribution to resource adequacy?

A: Yes. Figure 1 below provides a simple example of FCA clearing under concept 2 with one capacity zone. In this graph, supply bids from six hypothetical resources are shown in an ascending 'stair-step' supply curve, where each step represents the bid price and quantity of a distinct resource. The downward sloping line represents the demand for capacity in the FCA, which for simplicity alone is depicted here using a flat and then downward sloping line. (The ISO's actual MRI-based capacity demand curves used to administer the FCA are, as the name indicates, curves – a feature that is important to pricing, but not essential to this example's immediate purpose.)

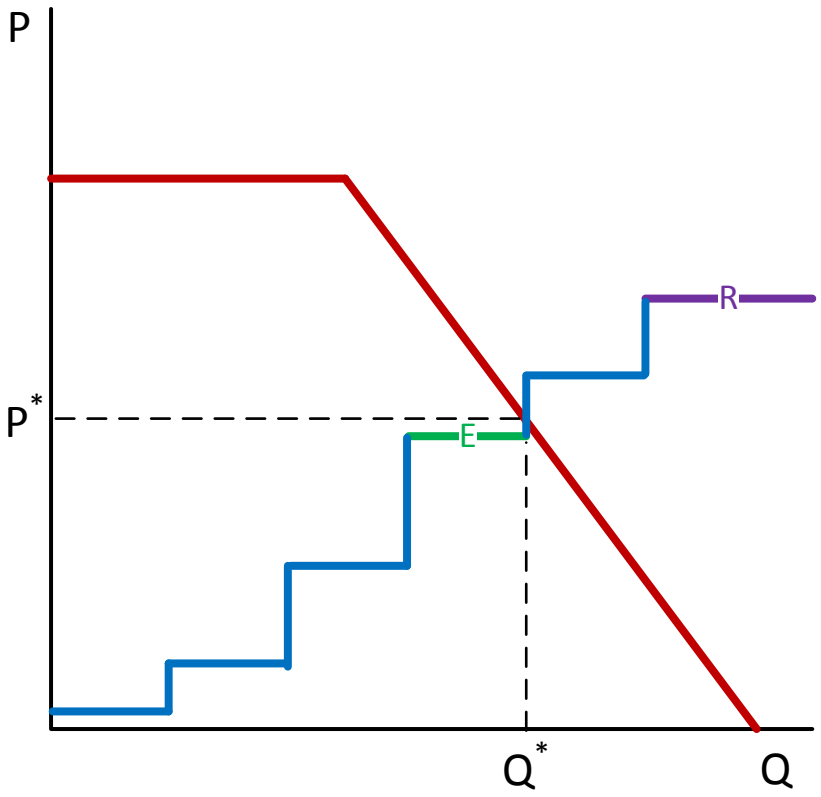

Figure 1

In Figure 1, auction prices are shown on the vertical axis and the FCA's clearing price is equal to P^*, set at the price where supply and demand intersect. The total quantity of cleared capacity in the FCA is equal to Q^*, again determined by where supply and demand intersect, as shown on the horizontal axis.

For purposes of this example only, I will assume that in the aggregate supply curve the resource represented by the horizontal line segment labeled R (for 'retained,' and shown in purple color) is to be retained for fuel security. Note that a completely different supply resource, labeled in Figure 1 as resource E (E for 'existing,' and shown in green color), which is not needed for fuel security, sells its capacity in

this example because its offer price falls below the FCA clearing price.

Q: Would this same clearing outcome occur under concept 1?

A: Yes. Under concept 1, resource R's bid would be administratively removed from the supply stack. The removal of resource R's bid would not impact the FCA clearing and the auction would again specify a clearing price of P^* that is paid to the cleared quantity of Q^* capacity. Resource E would again be awarded a CSO in the FCA if concept 1 was pursued.

Q: Would the clearing outcome illustrated in Figure 1 under either concept 1 or concept 2 raise concerns?

A: Yes. This outcome would raise two concerns under both concepts. First, because the FCA clearing does not account for the retained resource's contribution to resource adequacy, the region would procure excess resources. This would represent a costly and inefficient outcome.

Second, the FCA clearing price would not correspond to capacity's MRI value, as determined by the sloped demand curves. This inconsistency would produce capacity price signals that do not correspond to capacity's marginal reliability value and may incent unneeded entry from new resources, thereby exacerbating the over-procurement concern.

Q: Please describe the first concern, the procurement of excess resources, in more detail.

A: In the example above, resource R was not awarded a CSO in the FCA. Consistent with concepts 1 and 2, consider the situation where resource R is retained for fuel security and will operate during the Capacity Commitment Period ("CCP") either with a CSO or pursuant to a cost-of-service agreement. In either case, because resource R will have must-offer and other obligations under a CSO, or obligations that are comparable to those associated with a CSO, and is expected to operate throughout the CCP, it is appropriate to count resource R's contribution to resource adequacy in clearing the FCA. If an (otherwise retiring) resource is retained for fuel security, the region is acquiring its capacity – which reduces the system's Loss of Load Expectation – whether through an out-of-market CSO at an approved Retirement De-List Bid price, or through a regulated, Commission-reviewed and approved cost-of-service agreement. In either case, it is still acquiring the resource's capacity and its contribution (which is comparable in either case) to the system's resource adequacy objectives.

Q: Can you illustrate the over-procurement concern with a graphical example?

A: Figure 2 below updates the FCA clearing outcome from that shown earlier to more appropriately recognize that retained resource R will contribute to resource adequacy even if it does not receive a CSO. Graphically, this can be represented by shifting the aggregate supply curve to the right by an amount equal to resource R's qualified capacity quantity.

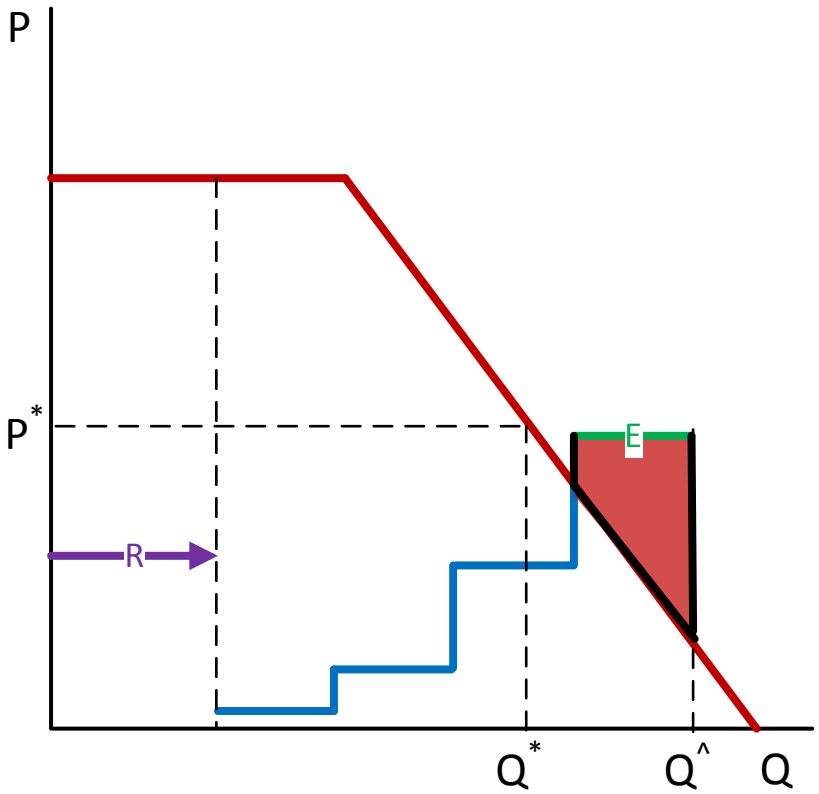

Figure 2

Recall that resource E is awarded a CSO in the FCA under either of the two concepts proffered in the July 2nd Order, in which the FCA clearing process does not consider resource R's contribution to resource adequacy. If resource R's contribution to resource adequacy *is* accounted for, the costs that resource E incurs to deliver capacity (assumed to be reflected in its FCA bid price) exceed the incremental resource adequacy benefit that resource E's capacity provides, as determined by the MRI-based capacity demand curves. This is illustrated in Figure 2, which shows that resource E's costs (represented by its bid price) exceed the demand curve's valuation for its incremental capacity.

Q: Will the procurement of E's capacity reduce social surplus, in conflict with the stated objective of the FCA clearing process?

A: Yes. Because resource E's cost of providing capacity exceeds the incremental resource adequacy benefit that it provides, the procurement of E's capacity reduces social surplus. This is contrary to the FCA's clearing objective to maximize social surplus,[7] and it represents a costly and inefficient outcome. The magnitude of the social surplus reduction, which is equal to the difference between the costs resource E incurs to deliver its capacity and the incremental resource adequacy benefit it provides, is represented graphically by the shaded trapezoidal area (shown in red color) in Figure 2.

Q: Please describe the second concern, the pricing inconsistency, in more detail.

A: One of the core objectives of the MRI-based capacity demand curves is to set capacity clearing prices in a manner consistent with capacity's resource adequacy value *at the margin* – meaning, the capacity clearing price is based on the expected reliability impact of the last increment of capacity procured. When an increment of capacity would significantly improve system reliability, the price should be high to reflect capacity's value. This signals to the market that capacity has significant value. Similarly, if an increment of capacity would instead have a more modest impact on system reliability, the price of capacity should be lower.

[7] *See* ISO Tariff at Section III.13.2.7.4.

This concept produces downward sloping demand curves that reflect that the last increment of capacity provides greater reliability value when capacity is scarce, and less value when it is abundant. Under either concept noted in the July 2nd Order, this critical link between capacity's price and its marginal reliability impact is broken.

Q: Please explain why the concepts proffered in the July 2nd Order would not lead capacity prices to be consistent with its MRI value.

A: As explained earlier, even if resource R is retained for fuel security via a cost-of-service agreement, its capacity contributes to resource adequacy in a manner similar to capacity resources awarded a CSO in the FCA. For purposes of calculating an increment of capacity's MRI value, and the FCA clearing prices, it is therefore appropriate to treat this resource as if it has a CSO.

However, the concepts noted in the July 2nd Order would fail to consider resource R's contributions to resource adequacy when determining capacity's MRI value and the auction clearing price. By failing to account for this resource, such approaches would specify an inflated auction clearing price for capacity resources procured (solely) for their contribution to resource adequacy. That inflated auction clearing price would be inconsistent with capacity's MRI value.

Q: Can you show this inconsistency in a graphical example?

A: Yes. To show the inconsistency, I use the same example discussed earlier and illustrated in Figure 1, where resource R is not awarded a CSO in the FCA because it is either administratively removed from the FCA (concept 1) or has a bid price that exceeds the FCA clearing price (concept 2).

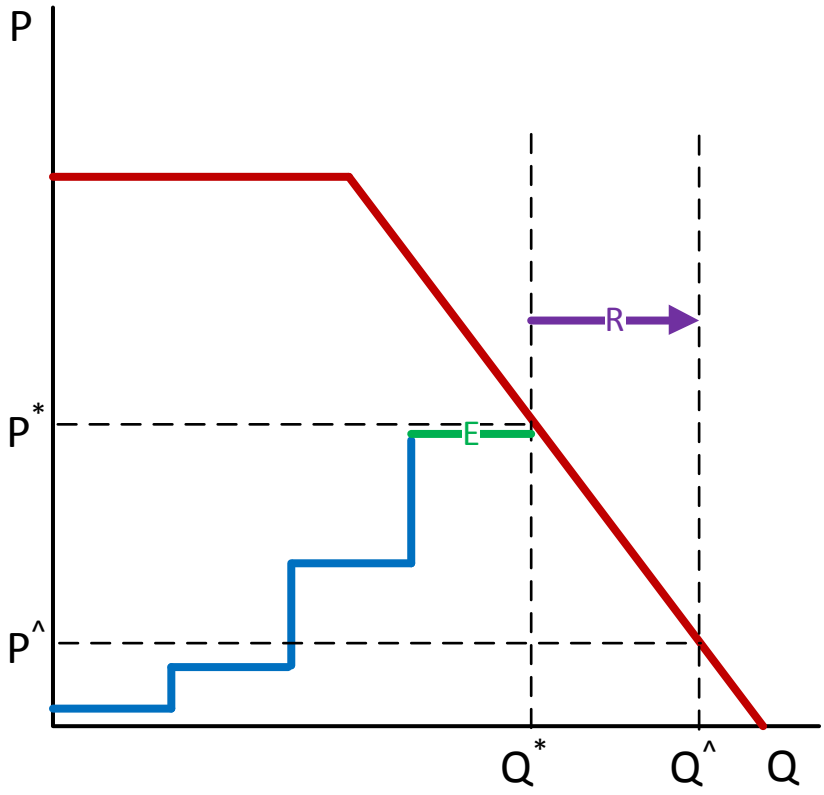

Figure 3

Consider Figure 3, which extends the earlier Figure 1. The quantity Q^* represents the capacity quantity that corresponds to an FCA clearing price of P^*, and is the same as shown previously in Figure 1. As explained in the context of Figure 1, the auction would clear at a price of P^* if the total CSO quantity awarded in the auction

was determined without accounting for resource R's contribution to resource adequacy (that is, assuming that the retained resource R has zero contribution to the system's resource adequacy).

Now consider the alternative situation, in which we account for resource R's contribution to resource adequacy. In this alternative situation, capacity's MRI value – and the price specified by the capacity demand curve – is different. As shown in Figure 3, the total capacity of all resources in this example is more than the quantity Q^*. Specifically, the total supply is the greater quantity represented as $Q^\wedge$ in Figure 3, which is equal to the sum of the cleared capacity Q^* and the qualified capacity of R.

As a rule, the marginal reliability impact of capacity decreases with additional supply. Thus, at the greater quantity $Q^\wedge$, capacity's resource adequacy benefit is lower (at the margin) than it is at the quantity Q^*. Specifically, in Figure 3, the lower marginal reliability impact-based value of capacity – after accounting for the resource adequacy contribution of retained resource R – is given by the demand curve at the price denoted by $P^\wedge$.

Let me now connect this to the inconsistency of prices, benefits, and costs. Under either of the two concepts put forth in the July 2nd Order, the capacity clearing price would be P^*. This price is not consistent with the marginal reliability benefit of capacity, which is the lower value of $P^\wedge$. In simple terms, under the concepts put

forth in the July 2nd Order, the FCA would fail to equate the benefits and costs of procuring capacity: the marginal resource would receive a price signal of P^* and incur costs potentially up to that price level, when its actual marginal resource adequacy benefit is the lower value $P^{\wedge}$. As seen in Figure 3, this marginal benefit $P^{\wedge}$ is clearly lower than the cost (i.e., the bid price) of resource E, which would receive a CSO under the two concepts noted in the July 2nd Order.

This example illustrates an instance where the concepts proffered in the July 2nd Order would produce an inflated FCA clearing price that is established without accounting for the resource adequacy contributions of a resource retained for fuel security. It is inflated in the specific sense that, as a result, the cost of the marginal resource acquired in the FCA clearing process exceeds the marginal resource adequacy benefit it provides.

Q: What concerns would arise if such a pricing inconsistency were to occur?

A: The MRI-based demand curves were developed to produce FCA prices that are consistent with capacity's marginal resource adequacy benefit. As shown in the above example, excluding resources retained for fuel security from this determination breaks this link because the pricing does not consider the resource adequacy contribution of resources retained for fuel security.

In such situations, the FCA will specify an inflated capacity price that is not based on the system's MRI value. This inflated price may allow resources to sell capacity

that reduces social surplus. Such an outcome occurs in Figure 3, where the inflated clearing price allows resource E to sell capacity even though its costs from doing so exceed the resource adequacy benefit this capacity provides. This inflated price may incent existing resources that would otherwise retire (and that may not be needed for fuel security) to continue operation, or lead to the entry of new resources that are costly and for which the incremental resource adequacy contributions are minimal. In each case, such outcomes are costly and inefficient.

Q: With these concerns in mind, does the ISO propose to use either concept put forth in the July 2nd Order?

A: No. Both of these concepts are likely to procure excess resources and specify prices that are inconsistent with capacity's MRI value. These concerns led the ISO to pursue a different treatment of resources retained for fuel security in the FCA.

IV. ISO'S PROPOSED TREATMENT OF RESOURCES RETAINED FOR FUEL SECURITY IN THE FCA

Q: How does the ISO propose to treat resources retained for fuel security in the FCA?

A: Under the ISO's proposal, any resource that is retained for fuel security will be entered into the FCA as a price taker. This treatment will ensure that resource adequacy contributions of the retained resource are considered when determining CSO awards and capacity clearing prices.

Q: Is this treatment similar to that which the ISO currently uses in the FCA for resources retained for transmission security?

A: Yes. Current Tariff provisions specify that resources that are retained for transmission security are generally treated as price takers in the FCA. As with resources that are retained for fuel security, this treatment ensures that the retained resource's contribution to resource adequacy is accounted for in determining CSO awards and capacity clearing prices.

Q: By entering resources retained for fuel security as price takers in the FCA, does the ISO's approach address the two concerns identified with the concepts proffered in the July 2nd Order in its proposed treatment?

A: Yes. The ISO's proposed treatment of resources retained for fuel security addresses both concerns discussed previously with the concepts noted in the July 2nd Order. More specifically, entering resources retained for fuel security as price takers in the FCA prevents the procurement of excess resources and avoids cost-benefit pricing inconsistencies.

Q: Please explain why entering resources retained for fuel security as price takers in the FCA will prevent the procurement of excess resources.

A: Recall the examples from Section III, where resource R is retained for fuel security and existing resource E also bids its capacity into the FCA. Under the ISO's proposal, resource R would be entered into the FCA as a price taker, rather than at its delist bid price (as mitigated, if applicable). This is illustrated in Figure 4 below.

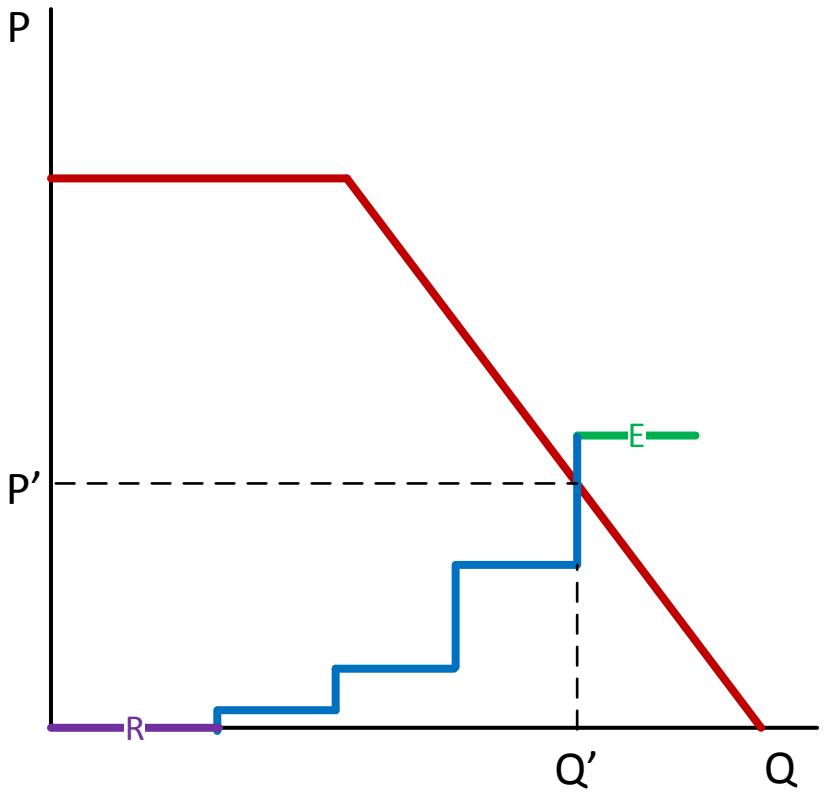

Figure 4

As first illustrated in Figure 2, resource E's cost of providing capacity exceeds the incremental resource adequacy benefit that it would provide the region, once resource R's contribution to resource adequacy is considered. Because the ISO's

proposal accounts for resource R's resource adequacy contribution in determining CSO awards and setting the FCA clearing price, it would not award an obligation to resource E in the situation depicted in Figure 4.

This is the appropriate outcome, as it is consistent with the FCA's objective of social surplus maximization and it prevents the region from procuring excess resources.

Q: Does this proposed treatment produce a different clearing outcome than each of the two concepts proffered in the July 2nd Order?

A: In the context of this example, yes. While resource E is not awarded an obligation under the ISO's proposal in the situation in Figure 4, resource E would receive a CSO under each of the concepts proffered in the July 2nd Order. (That latter outcome was shown in Figure 1, where resource E acquires a CSO in the FCA's clearing.) As a result, the ISO's proposed treatment can produce different clearing outcomes than the two concepts discussed in the July 2nd Order.

As before, awarding resource E an obligation would lead the region to procure excess resources because resource E's costs of delivering capacity would exceed the incremental resource adequacy benefit it provides, as measured by the MRI-based demand curves. As a result, this excess procurement that would occur under the concepts proffered in the July 2nd Order would reduce social surplus and

undermine the auction's core objective of maximizing social surplus. This scenario was discussed at length in Section III.

Q: Please explain why entering resources retained for fuel security as price takers in the FCA will produce clearing prices that are consistent with capacity's MRI value.

A: By entering resources retained for fuel security as price takers in the auction, the FCA clearing price will be based on the aggregate MW quantity of all obligated resources (whether via CSOs or similar obligations under a cost-of-service agreement). This treatment accounts for the resource adequacy contributions of resources retained for fuel security. At this aggregate MW quantity, the capacity demand curves will specify a price that properly reflects capacity's incremental benefit – that is, its true MRI value.

Q: Does this treatment produce FCA outcomes that maximize social surplus?

A: Yes. More specifically, if an incremental MW of capacity was available at a cost less than the clearing price of P' in Figure 4, then the auction would award a CSO to that MW because the reliability benefit to doing so, as measured by the MRI-based demand curves, would exceed the cost of supplying that incremental capacity. The incremental capacity would be willing to accept such an award because the capacity price it would receive exceeds its costs of meeting its obligation.

However, if the next increment of capacity was offered at a cost above P', as is the case in the example shown in Figure 4 where this next increment is offered by resource E, then it would not be awarded a CSO because the cost of supplying this increment of capacity exceeds the resource adequacy benefit it provides, as measured by the MRI-based demand curves. Furthermore, the resource would prefer not to receive such an award at the prevailing price of P', because the payment from providing capacity at that price would not fully cover its cost of meeting this obligation.

Q: Does this outcome differ from the two concepts proffered in the July 2nd Order?

A: Yes. As discussed in Section III of this testimony, the concepts briefly identified in the July 2nd Order would not consider the resource adequacy contribution of resource R when determining capacity's marginal reliability impact. Figure 3 illustrates how ignoring this contribution will lead to a disparity between the auction's clearing price (P^*), and the price that more accurately reflects where the incremental benefit of capacity equals its marginal reliability value ($P^{\wedge}$). As a result, the two concepts proffered in the July 2nd Order create a price disparity that may lead to an over-procurement of capacity that reduces social surplus, and send an incorrect price signal to the market.

V. THE ISO'S PROPOSAL TO TREAT RESOURCES RETAINED FOR FUEL SECURITY AS PRICE TAKERS DOES NOT SUPPRESS FCM PRICES

Q: Will the ISO's proposal to treat resources retained for fuel security as price takers generally produce FCM prices that are lower than either of the concepts proffered in the July 2nd Order?

A: Yes. As discussed in Sections III and IV above, the ISO's proposed treatment will consider the resource adequacy contributions of any retained resources when setting capacity clearing prices, whereas the concepts identified in the July 2nd Order may not. Because of the downward sloping nature of the MRI-based demand curves, considering the resource adequacy contributions of retained resources will produce lower auction clearing prices than approaches that ignore these contributions.

Q: What would the competitive capacity clearing price be if the ISO was able to include a new constraint in the FCA to procure resources that satisfy the region's fuel security needs?

A: Under that 'new constraint' scenario, conceptually speaking, the FCA clearing process would consider both a resource's contribution to fuel security as well its contribution to the FCA's traditional resource adequacy goal when awarding CSOs. Broadly, that treatment is similar to how the FCA accounts for constrained capacity zones. More specifically, capacity awarded an obligation in a constrained capacity zone may provide slightly different (i.e., locationally different) reliability benefits than that in the Rest-of-Pool Capacity Zone. Nonetheless, this capacity in a

constrained zone is counted along with that in the Rest-of-Pool Capacity Zone for purposes of determining the system's total cleared capacity and its clearing price.

As a result, if the ISO were to develop a new constraint in the FCA that seeks to reflect the region's fuel security needs, it would produce an FCA clearing price for resources acquired (solely) for resource adequacy that is equivalent to the price that occurs under the ISO's proposed price taker treatment. This competitive price is lower than that which would result from either of the concepts noted in the July 2nd Order.

Q: Would a capacity design that includes a constraint reflecting the region's fuel security needs provide equivalent compensation to the ISO's proposal for all resources?

A: No. The introduction of a fuel security constraint would effectively reflect that some resources provide two reliability attributes to the region – resource adequacy and fuel security. While a fuel security constraint and the ISO's proposal provide equivalent compensation for resource adequacy, they would differ in how they remunerate resources that provide both reliability attributes.

While the inclusion of a hypothetical fuel security constraint may allow the market to compensate resources for providing this service in a transparent and uniform manner, the ISO's price taker proposal does not include such a constraint for the reasons discussed below. In sum, resources that provide both resource adequacy

and fuel security may not be fully compensated for their fuel security attribute under the ISO's proposal in this instant filing.

Q: Why don't the ISO's proposed rules include a fuel security constraint?

A: As discussed in more detail later in my testimony in Section VI, expanding the FCM to develop such a constraint would require significant work to define a fuel security "service" or capability, to determine what resources are eligible to sell fuel security service, to specify the ISO's demand for this service, to evaluate the incremental obligations associated with selling this service, and a myriad of related design issues. Furthermore, without further analysis, it is premature to presume that this service is most appropriately procured in the capacity market, rather than in the energy market or as a new ancillary service.

Q: Would the two concepts noted in the July 2nd Order have this same shortcoming, meaning would they not compensate resources for providing fuel security in a transparent and uniform manner?

A: Yes. Neither concept noted in the July 2nd Order includes a fuel security constraint or incremental payments for other resources that may be able to provide this additional reliability attribute. Under those concepts, resources would therefore not be compensated for providing this reliability attribute unless they were retained and paid an out-of-market contract.

Q: Does the need to retain resources for fuel security indicate that there is a design shortcoming in the ISO's suite of wholesale markets?

A: Yes. While a retained resource may be compensated for providing this service via an out-of-market payment, other resources that may be able to provide this service but sell their capacity at the competitive clearing price receive no such compensation.

While the introduction of a fuel security constraint represents one conceptual approach to addressing this concern, there may be other, superior approaches to compensate resources providing fuel security in the capacity, energy, or ancillary service markets (or some combination thereof). Designing market enhancements to comparably compensate all resources providing fuel security (once defined properly) would require further study.

As part of its continuing efforts to address the region's fuel security concerns, the ISO has indicated that it plans to assess whether a mechanism to compensate resources for fuel security can be developed in time for FCA 14.[8] Nonetheless, and most pertinent to the instant filing, such possibilities focus on compensation for providing fuel security and do not impact the appropriate price paid in the capacity market to supply acquired (solely) for the purpose of resource adequacy.

[8] *See* Transmittal Letter of ISO New England Inc., August 31, 2018, that accompanies this testimony in the above-captioned docket at pp. 17-18.

Q: Based on these observations, is it correct to conclude that the ISO's proposed treatment would not suppress the capacity prices for providing resource adequacy?

A: Yes. Because the ISO's proposal produces the same capacity clearing price for resource adequacy as would occur if the FCA added a new constraint to reflect the region's fuel security needs, it is correct to conclude that it produces a competitive FCA price for all resources acquired (solely) for resource adequacy purposes. That capacity clearing price is correct under the ISO's proposed treatment, and is not suppressed.

Q: If the ISO's proposed treatment produces FCA prices that are consistent with capacity's MRI value (and therefore not suppressed), is it correct to conclude that the higher prices that would result from the concepts noted in the July 2nd Order are inflated?

A: Yes. These treatments would produce an FCA clearing price that exceeds the competitive price that would be produced if the auction modeled an additional constraint to help meet the region's fuel security needs. Furthermore, as outlined in Section III, the prices that result from the concepts proffered in the July 2nd Order are not consistent with capacity's MRI value. More specifically, these prices do not account for the resource adequacy contributions of resources retained for fuel security, and this leads them to exceed the actual marginal reliability value of an increment of capacity.

VI. OTHER OPTIONS CONSIDERED BY THE ISO AND STAKEHOLDERS

Q: Beyond entering the resource as a price taker and the two approaches proffered in the July 2nd Order, did the ISO evaluate other potential treatments for resources retained for fuel security?

A: Yes. The ISO considered a range of auction treatments for resources retained for fuel security. Generally, these alternate approaches fall into one of two buckets. The first bucket includes auction treatments that, while appearing different, would produce the same auction capacity awards and prices as the ISO's proposed price-taker treatment. The second bucket represents approaches that seek to procure fuel security either as part of the FCA, or concurrently with this auction. Unlike other concepts considered, approaches that fall into this second bucket would recognize that fuel security may provide incremental value to the region that is not currently recognized in the ISO-administered markets.

Q: Please describe the first bucket, which refers to approaches that are likely to produce equivalent auction outcomes to treating resources retained for fuel security as price takers.

A: The ISO assessed several design frameworks that appear different from entering resources retained for fuel security as price takers, but will effectively produce the same FCA clearing price and CSO awards.

Q: Can you provide an example of an approach that would produce an equivalent outcome to treating resources retained for fuel security as price takers?

A: Yes. The ISO evaluated two approaches that fit into this first bucket. The first of these approaches would exclude resources retained for fuel security from the FCA altogether, while also removing an equivalent amount of capacity demand from the auction. The second approach would enter the retained resource into the FCA at its delist bid price (as mitigated, if applicable), while introducing a 'resource specific' constraint into the FCA clearing process that ensures that it is awarded a CSO.

Q: Please describe this first approach, where the retained resource is removed from the FCA along with an equivalent quantity of demand, in more detail.

A: Under this approach, any resource retained for fuel security would not participate in the FCA, much like in the first concept proffered in the July 2nd Order. Moreover, this approach would reduce total capacity demand by a MW quantity equal to the total qualified capacity of the resources retained for fuel security.

Q: How would this shift in capacity demand would be represented?

A: Returning to our earlier examples, imagine that resource R has 1,000 MW of qualified capacity. In this approach, before conducting the FCA, the ISO would reduce capacity demand by 1,000 MW. Mechanically, this reduction 'shifts' the demand curve to the left by 1,000 MW. More specifically, if the original demand curves specified a price of $5.00 / kw-month at a capacity quantity of 35,000 MW,

the reduction in demand will lead the updated demand curve to produce a price of $5.00 / kw-month at a quantity of 34,000 MW. This is shown in Figure 5 below.

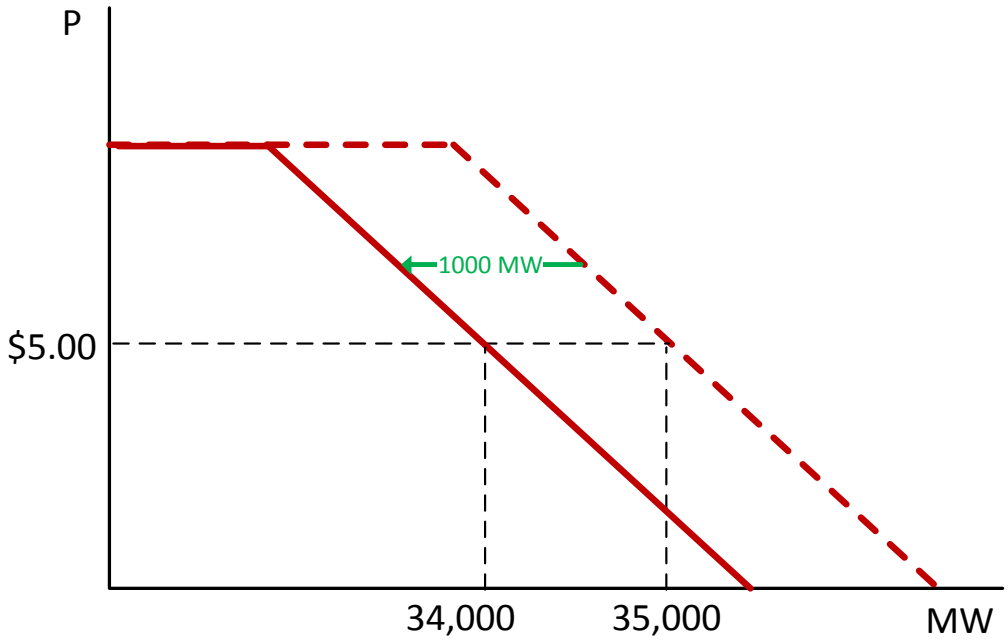

Figure 5

Q: Would this approach produce the same FCA clearing price as occurs under the ISO's proposal, where the retained resource is treated as a price taker and no shift to demand is made?

A: Yes. These two approaches will produce the same FCA clearing prices. This can be understood by starting with the ISO's approach, where resources retained for fuel security are treated as price takers, and then evaluating the aggregate pricing impact of (i) removing the retained resource from the supply curve and (ii) reducing capacity demand by an equivalent amount.

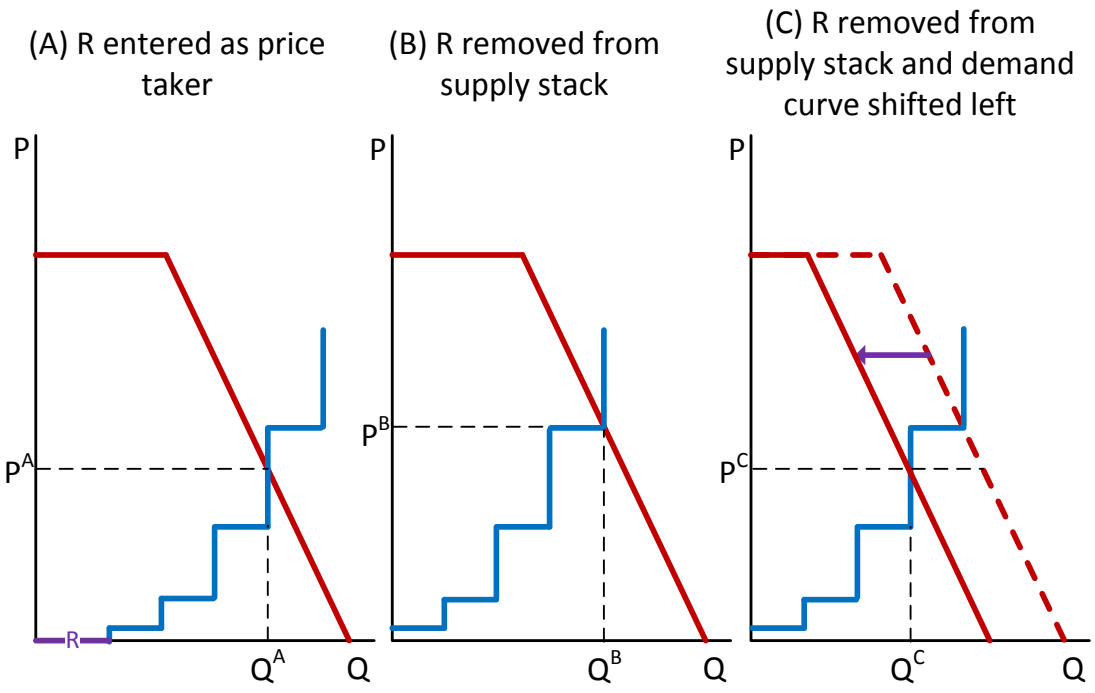

Figure 6

Figure 6 illustrates this aggregate effect using three panels. Panel A illustrates the FCA clearing outcome under the ISO's proposal, where resource R is retained for fuel security. Under this proposal, resource R is represented in the FCA as a price taker. The clearing price is P^A and the total cleared quantity of capacity is Q^A.

Panel B then removes resource R from the supply stack. In isolation, this act would increase the FCA clearing price to P^B (recall, this is the outcome that would occur under the concepts proffered in the July 2nd Order). Finally, Panel C accounts for the impact of removing an equivalent amount of capacity demand. This produces a clearing price, P^C, that is the same as the price, P^A, that occurs when resource R is entered as a price taker in Panel A.

Q: Does this property hold in all scenarios?

A: Excluding resources retained for fuel security from the FCA while also removing a corresponding quantity of capacity demand will produce the same auction clearing prices as entering these resources as price takers in all scenarios. This equivalency holds because, while a leftward shift in the supply curve will increase the clearing price, an equivalent leftward shift in demand will decrease the clearing price by an equal amount. In aggregate, these two impacts will therefore cancel each other out, leading the auction to clear at the price that would occur if no shifts occurred to either supply or demand.

Q: Does the quantity of CSO awards differ between the ISO's proposed approach and the concept where retained resources are excluded and demand is shifted left?

A: Yes. The total quantity of CSO awards will decrease when retained resources are removed and demand is adjusted accordingly. However, the decrease in total awards is equal to the capacity quantity that corresponds to resources retained for fuel security. All resources that are not retained for fuel security receive the same auction determination (i.e., awarded a CSO or not) under the ISO's proposal and this alternate concept, and because the retained resource receives an out-of-market contract under either approach, total costs to consumers are equivalent.

Q: Please describe the second approach noted earlier, where the ISO introduces a resource-specific constraint in the FCA, in more detail.

A: Under this approach, any resource retained for fuel security would be entered into the FCA at its delist bid price (as mitigated, if applicable). However, the ISO would introduce additional constraints in the FCA that ensure that the auction awards a CSO to each resource retained for fuel security.

Q: Would a retained resource's contributions to resource adequacy be considered when determining capacity awards?

A: Yes. A retained resource would be awarded a CSO in the FCA, and its contribution to resource adequacy would be considered when determining CSO awards and the auction clearing price paid to other resources.

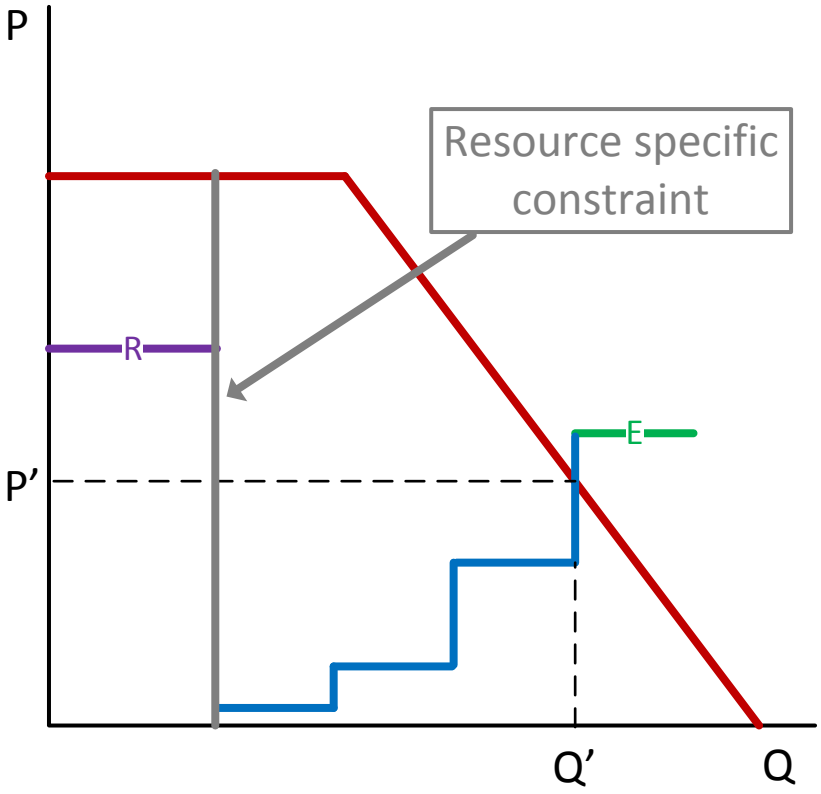

Figure 7

This proposed concept is shown in Figure 7, where an additional vertical constraint is included to ensure that resource R, which is needed for fuel security, is awarded a CSO in the auction. Resource R's capacity is therefore counted for purposes of awarding CSOs to other resources participating in the FCA.

Q: Is this treatment consistent with how the FCA treats constraints more generally?

A: Yes. As discussed in Section V of my testimony, the FCA counts any capacity that is awarded an obligation due to a constraint when determining CSO awards for the system. For example, if a high cost resource is awarded a CSO because it is located in an import-constrained Capacity Zone, where capacity's marginal reliability impact is large, then its capacity is also counted for purposes of determining capacity awards and prices at the system level.

Q: In your view, is there a clear benefit to pursuing either of these 'first bucket' approaches over the ISO's proposal?

A: No. Both of these 'first bucket' approaches – the removal of the retained resource and a corresponding demand quantity from the FCA, and the introduction of a resource-specific constraint – would produce equivalent outcomes to the ISO's proposed treatment of entering the resource as a price taker. In simple terms, neither of these 'first bucket' approaches provides a material benefit relative to the proposal being put forth by the ISO in the instant filing. However, each of these

alternate approaches would take more time and resources to implement, relative to the ISO's proposal, to achieve no material benefit.

Based on these observations, the ISO did not recommend either of these two 'first bucket' approaches in its discussions with stakeholders, and is not proposing them in the instant filing.

Q: Please describe the second bucket, which refers to approaches that seek to assign a value to providing fuel security either within, or coincident with, the FCA clearing process.

A: Under such approaches, the ISO and stakeholders would develop a methodology that provides an additional payment to resources that help the region meet its fuel security objectives. This payment could occur within the FCA clearing process, or it could be made outside of the auction. One example of a methodology that fits within this bucket is the fuel security constraint discussed in Section V of this testimony.

Q: Would this approach consider the resource adequacy contributions of resources that provide fuel security?

A: Generally, yes. Resources that receive an incremental payment for providing fuel security would also (potentially) be awarded a CSO and have their resource adequacy contributions counted for purposes of clearing the FCA.

Q: For capacity supply that is deemed not to help the region meet its fuel security objectives, would this approach be expected to produce equivalent compensation to the ISO's price-taker proposal?

A: Resources that do not help the region meet its fuel security objectives would generally receive the same FCA compensation as under the ISO's proposal, as was explained in Section V earlier. The exact FCA clearing prices may vary with the specific quantity of resources acquired to meet the fuel security objectives, however.

Q: For capacity supply that is deemed to help meet the region's fuel security objectives, would this approach also be expected to produce equivalent compensation to the ISO's price-taker proposal?

A: Generally, no. If the FCA included a fuel security constraint, the compensation paid for providing the fuel security service would ideally reflect the marginal cost of providing this reliability attribute. For resources that provide both the fuel security service and resource adequacy, this payment would be in addition to the auction's compensation for resource adequacy, as determined by the auction's demand curves.

As a consequence, the price paid to fuel secure resources under a 'new constraint' approach may exceed the compensation they are paid under the ISO's price-taker proposal in the instant filing. The reason for this difference is that, under the ISO's proposal, these resources are paid the same clearing price as resources that do not

provide fuel security. If a fuel security constraint was added and higher cost resources were awarded CSOs to help the region satisfy this constraint, all fuel secure resources would receive a higher capacity payment to reflect the higher incremental cost associated with providing this reliability attribute.

Q: Would such an approach require the ISO and its stakeholders to develop criteria that distinguish between capacity that provides fuel security, and that which does not?

A: Yes. This approach would require the clear determination of what resources are eligible to supply 'fuel secure' capacity, and at what quantities. This determination could depend on the resource type, the specific arrangements and contracts a resource owner sets up to address fuel resupply logistics and replenishment, or many other factors. To date, the ISO and its stakeholders have not assessed or developed such criteria.

Q: Would this approach also require the ISO and its stakeholders to develop a methodology that defines, and specifies the region's demand for, fuel security service?

A: Yes. Any proposal must specify the region's incremental willingness to pay for an additional MW of fuel secure capacity. This demand could be represented in a number of ways, including via a new constraint or a new demand curve in the FCA, or as a voluntary program with a fixed payment outside of the auction. To date, the ISO and its stakeholders have not evaluated methodologies to specify the region's

demand for such a service, or how it would logically vary with price (as it is unclear, at present, whether and how the engineering-economic framework of the FCA's MRI-based capacity demand curves could be applied to a yet-to-be-defined service).

Q: Would such a proposal include additional obligations that a resource must fulfill in exchange for this incremental payment?

A: Possibly. This represents yet another element of such a design that, to date, has not been evaluated in detail by the ISO and its stakeholders.

Q: Did the uncertainties and outstanding design issues noted in your prior three answers contribute to the ISO's decision not to propose such a design at the present time?

A: Yes, at least in part. As discussed in Sections IV and V of this testimony, the ISO's price-taker proposal produces the appropriate price for resources acquired in the FCM (solely) for resource adequacy purposes. As I also note in Section V, there may be concerns about the lack of transparent and uniform compensation for resources that also provide fuel security. More specifically, resources that provide this attribute but are not retained for reliability may not be fully remunerated for providing this reliability attribute, under the current market design.

While the introduction of a fuel security constraint in the capacity market represents one conceptual approach to address this issue, many of its core design questions

have not been assessed by the ISO or its stakeholders. Furthermore, a fuel security constraint in the capacity market represents but one of many potential approaches to ameliorate this concern. A more comprehensive analysis would also consider whether this service would more appropriately be compensated in the energy/ancillary service markets, or via a new product market entirely.

To determine the most prudent path to address this broader concern, I believe it would require a more comprehensive analysis and a potentially substantial market design effort by a team of qualified professionals. To date, I have not conducted such a comprehensive analysis.

Q: Does this conclude your testimony?

A: Yes.

DECLARATION

I declare under penalty of perjury that the foregoing Testimony of Christopher Geissler, on behalf of ISO New England Inc., is true and correct to the best of my knowledge, information, and belief.

Executed on: August 31, 2018

Christopher Geissler, Ph.D.

Docket No. EL18-182-000
Exhibit ISO-3
Marked Tariff

III.13.2. Annual Forward Capacity Auction.

III.13.2.1. Timing of Annual Forward Capacity Auctions.

Each Forward Capacity Auction will be conducted beginning on the first Monday in the February that is approximately three years and four months before the beginning of the associated Capacity Commitment Period (unless, no later than the immediately preceding December 1, an alternative date is announced by the ISO), or, where exigent circumstances prevent the start of the Forward Capacity Auction at that time, as soon as possible thereafter.

III.13.2.2. Amount of Capacity Cleared in Each Forward Capacity Auction.

The total amount of capacity cleared in each Forward Capacity Auction shall be determined using the System-Wide Capacity Demand Curve and the Capacity Zone Demand Curves for the modeled Capacity Zones pursuant to Section III.13.2.3.3.

III.13.2.2.1. System-Wide Capacity Demand Curve.

The MRI Transition Period is the period from the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2020 through the earlier of:

(i) the Forward Capacity Auction for which the amount of the Installed Capacity Requirement (net of HQICCs) that is filed by the ISO with the Commission pursuant to Section III.12.3 for the upcoming Forward Capacity Auction is greater than or equal to the sum of: 34,151 MW, and: (a) 722 MW (for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2020); (b) 375 MW (for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2021), or; (c) 150 MW (for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2022);

(ii) the Forward Capacity Auction for which the product of the system-wide Marginal Reliability Impact value, calculated pursuant to Section III.12.1.1, and the scaling factor specified in Section III.13.2.2.4, specifies a quantity at $7.03/kW-month in excess of the MW value determined under the applicable subsection (2)(b), (2)(c), or (2)(d), below, or;

(iii) the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2022.

During the MRI Transition Period, the System-Wide Capacity Demand Curve shall consist of the following three segments:

(1) at prices above $7.03/kW-month and below the Forward Capacity Auction Starting Price, the System-Wide Capacity Demand Curve shall specify a price for system capacity quantities based on the product of the system-wide Marginal Reliability Impact value, calculated pursuant to Section III.12.1.1, and the scaling factor specified in Section III.13.2.2.4;

(2) at prices below $7.03/kW-month, the System-Wide Capacity Demand Curve shall be linear between $7.03/kW-month and $0.00/kW-month and determined by the following quantities:
   (a) At the price of $0.00/kW-month, the quantity specified by the System-Wide Capacity Demand Curve shall be 1616 MW plus the MW value determined under the applicable provision in (b), (c), or (d) of this subsection.
   (b) for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2020, at $7.03/kW-month, the quantity shall be the lesser of:
      1. 35,437 MW; and
      2. 722 MW plus the quantity at which the product of the system-wide Marginal Reliability Impact value and the scaling factor yield a price of $7.03/kW-month;
   (c) for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2021, at $7.03/kW-month, the quantity shall be the lesser of:
      1. 35,090 MW; and
      2. 375 MW plus the quantity at which the product of the system-wide Marginal Reliability Impact value and the scaling factor yield a price of $7.03/kW-month;
   (d) for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2022, at $7.03/kW-month, the quantity shall be the lesser of:
      1. 34,865 MW; and
      2. 150 MW plus the quantity at which the product of the system-wide Marginal Reliability Impact value and the scaling factor yield a price of $7.03/kW-month

(3) a price of $7.03/kW-month for all quantities between those curves segments.

In addition to the foregoing, the System-Wide Capacity Demand Curve shall not specify a price in excess of the Forward Capacity Auction Starting Price.

Following the MRI Transition Period, the System-Wide Capacity Demand Curve shall specify a price for system capacity quantities based on the product of the system-wide Marginal Reliability Impact value, calculated pursuant to Section III.12.1.1, and the scaling factor specified in Section III.13.2.2.4. For any system capacity quantity greater than 110% of the Installed Capacity Requirement (net of HQICCs), the System-Wide Capacity Demand Curve shall specify a price of zero. The System-Wide Capacity Demand Curve shall not specify a price in excess of the Forward Capacity Auction Starting Price.

III.13.2.2.2. Import-Constrained Capacity Zone Demand Curves.

For each import-constrained Capacity Zone, the Capacity Zone Demand Curve shall specify a price for all Capacity Zone quantities based on the product of the import-constrained Capacity Zone's Marginal Reliability Impact value, calculated pursuant to Section III.12.2.1.3, and the scaling factor specified in Section III.13.2.2.4. The prices specified by an import-constrained Capacity Zone Demand Curve shall be non-negative. At all quantities greater than the amount of capacity for which the Capacity Zone Demand Curve specifies a price of $0.01/kW-month, the Capacity Zone Demand Curve shall specify a price of zero. The Capacity Zone Demand Curve shall not specify a price in excess of the Forward Capacity Auction Starting Price.

III.13.2.2.3. Export-Constrained Capacity Zone Demand Curves.

For each export-constrained Capacity Zone, the Capacity Zone Demand Curve shall specify a price for all Capacity Zone quantities based on the product of the export-constrained Capacity Zone's Marginal Reliability Impact value, calculated pursuant to Section III.12.2.2.1, and the scaling factor specified in Section III.13.2.2.4. The prices specified by an export-constrained Capacity Zone Demand Curve shall be non-positive. At all quantities less than the amount of capacity for which the Capacity Zone Demand Curve specifies a price of negative $0.01/kW-month, the Capacity Zone Demand Curve shall specify a price of zero.

III.13.2.2.4. Capacity Demand Curve Scaling Factor.

The demand curve scaling factor shall be set at the value such that, at the quantity specified by the System-Wide Capacity Demand Curve at a price of Net CONE, the Loss of Load Expectation is 0.1 days per year.

III.13.2.3. Conduct of the Forward Capacity Auction.

The Forward Capacity Auction shall include a descending clock auction, which will determine, subject to the provisions of Section III.13.2.7, the Capacity Clearing Price for each Capacity Zone modeled in that Forward Capacity Auction pursuant to Section III.12.4, and the Capacity Clearing Price for certain offers from New Import Capacity Resources and Existing Import Capacity Resources pursuant to Section III.13.2.3.3(d). The Forward Capacity Auction shall determine the outcome of all offers and bids accepted during the qualification process and submitted during the auction. The descending clock auction shall be conducted as a series of rounds, which shall continue (for up to five consecutive Business Days, with up to eight rounds per day, absent extraordinary circumstances) until the Forward Capacity Auction is concluded for all modeled Capacity Zones in accordance with the provisions of Section III.13.2.3.3. Each round of the Forward Capacity Auction shall consist of the following steps, which shall be completed simultaneously for each Capacity Zone included in the round:

III.13.2.3.1. Step 1: Announcement of Start-of-Round Price and End-of-Round Price.

For each round, the auctioneer shall announce a single Start-of-Round Price (the highest price associated with a round of the Forward Capacity Auction) and a single (lower) End-of-Round Price (the lowest price associated with a round of the Forward Capacity Auction). In the first round, the Start-of-Round Price shall equal the Forward Capacity Auction Starting Price for all modeled Capacity Zones. In each round after the first round, the Start-of-Round Price shall equal the End-of-Round Price from the previous round.

III.13.2.3.2. Step 2: Compilation of Offers and Bids.

The auctioneer shall compile all of the offers and bids for that round, as follows:

(a) **Offers from New Generating Capacity Resources, New Import Capacity Resources, and New Demand Capacity Resources.**

(i) The Project Sponsor for any New Generating Capacity Resource, New Import Capacity Resource that is backed by a single new External Resource and that is associated with an

investment in transmission that increases New England's import capability, New Import Capacity Resource that is associated with an Elective Transmission Upgrade, or New Demand Capacity Resource accepted in the qualification process for participation in the Forward Capacity Auction may submit a New Capacity Offer indicating the quantity of capacity that the Project Sponsor would commit to provide from the resource during the Capacity Commitment Period at that round's prices. A New Capacity Offer shall be defined by the submission of one to five prices, each strictly less than the Start-of-Round Price but greater than or equal to the End-of-Round Price, and an associated quantity in the applicable Capacity Zone. Each price shall be expressed in units of dollars per kilowatt-month to an accuracy of at most three digits to the right of the decimal point, and each quantity shall be expressed in units of MWs to an accuracy of at most three digits to the right of the decimal point. A New Capacity Offer shall imply a supply curve indicating quantities offered at all of that round's prices, pursuant to the convention of Section III.13.2.3.2(a)(iii).

(ii) If the Project Sponsor of a New Generating Capacity Resource, New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability, New Import Capacity Resource that is associated with an Elective Transmission Upgrade, or New Demand Capacity Resource elects to offer in a Forward Capacity Auction, the Project Sponsor must offer the resource's full FCA Qualified Capacity at the Forward Capacity Auction Starting Price in the first round of the auction. A New Capacity Offer for a resource may in no event be for greater capacity than the resource's full FCA Qualified Capacity at any price. A New Capacity Offer for a resource may not be for less capacity than the resource's Rationing Minimum Limit at any price, except where the New Capacity Offer is for a capacity quantity of zero.

(iii) Let the Start-of-Round Price and End-of-Round Price for a given round be P_S and P_E, respectively. Let the m prices ($1 \leq m \leq 5$) submitted by a Project Sponsor for a modeled Capacity Zone be $p_1, p_2, \ldots, p_m$, where $P_S > p_1 > p_2 > \ldots > p_m \geq P_E$, and let the associated quantities submitted for a New Capacity Resource be $q_1, q_2, \ldots, q_m$. Then the Project Sponsor's supply curve, for all prices strictly less than P_S but greater than or equal to P_E, shall be taken to be:

$$S(p) = \begin{cases} q_0, & \text{if } p > p_1, \\ q_1, & \text{if } p_2 < p \le p_1, \\ q_2, & \text{if } p_3 < p \le p_2, \\ \text{L} \quad \text{L} \quad , \\ q_m, & \text{if } p \le p_m. \end{cases}$$

where, in the first round, q_0 is the resource's full FCA Qualified Capacity and, in subsequent rounds, q_0 is the resource's quantity offered at the lowest price of the previous round.

(iv) Except for Renewable Technology Resources and except as provided in Section III.13.2.3.2(a)(v), a New Capacity Resource may not include any capacity in a New Capacity Offer during the Forward Capacity Auction at any price below the resource's New Resource Offer Floor Price. The amount of capacity included in each New Capacity Offer at each price shall be included in the aggregate supply curves at that price as described in Section III.13.2.3.3.

(v) Capacity associated with a New Import Capacity Resource (other than a New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability or a New Import Capacity Resource that is associated with an Elective Transmission Upgrade) shall be automatically included in the aggregate supply curves as described in Section III.13.2.3.3 at prices at or above the resource's offer prices (as they may be modified pursuant to Section III.A.21.2) and shall be automatically removed from the aggregate supply curves at prices below the resource's offer prices (as they may be modified pursuant to Section III.A.21.2), except under the following circumstances:

In any round of the Forward Capacity Auction in which prices are below the Dynamic De-List Bid Threshold, the Project Sponsor for a New Import Capacity Resource (other than a New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability or a New Import Capacity Resource that is associated with an Elective Transmission Upgrade) with offer prices (as they may be modified pursuant to Section III.A.21.2) that are less than the Dynamic Delist Bid Threshold may submit a New Capacity Offer indicating the quantity of capacity that the Project Sponsor would commit to provide from the resource during the Capacity Commitment Period at that round's prices. Such an offer shall be defined by the submission of one to five

prices, each less than the Dynamic De-List Bid Threshold (or the Start-of-Round Price, if lower than the Dynamic De-List Bid Threshold) but greater than or equal to the End-of-Round Price, and a single quantity associated with each price. Such an offer shall be expressed in the same form as specified in Section III.13.2.3.2(a)(i) and shall imply a curve indicating quantities at all of that round's relevant prices, pursuant to the convention of Section III.13.2.3.2(a)(iii). The curve may not increase the quantity offered as the price decreases.

(b) **Bids from Existing Capacity Resources**

(i) Static De-List Bids, Permanent De-List Bids, Retirement De-List Bids, and Export Bids from Existing Generating Capacity Resources, Existing Import Capacity Resources, and Existing Demand Capacity Resources, as finalized in the qualification process or as otherwise directed by the Commission shall be automatically bid into the appropriate rounds of the Forward Capacity Auction, such that each such resource's FCA Qualified Capacity will be included in the aggregate supply curves as described in Section III.13.2.3.3 until any Static De-List Bid, Permanent De-List Bid, Retirement D-List Bid, or Export Bid clears in the Forward Capacity Auction, as described in Section III.13.2.5.2, and is removed from the aggregate supply curves. In the case of a Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid at or above the Forward Capacity Auction Starting Price, or where a Permanent De-List Bid or Retirement De-List Bid is subject to an election under Section III.13.1.2.4.1(a), the resource's FCA Qualified Capacity will be reduced by the quantity of the de-list bid (unless the resource was retained for reliability pursuant to Section III.13.1.2.3.1.5.1) and the Permanent De-List Bid or Retirement De-List Bid shall not be included in the Forward Capacity Auction. Permanent De-List Bids and Retirement De-List Bids subject to an election under Section III.13.1.2.4.1(a) or Section III.13.1.2.4.1(b) shall not be included in the Forward Capacity Auction and shall be treated according to Section III.13.2.3.2(b)(ii). In the case of a Static De-List Bid, if the Market Participant revised the bid pursuant to Section III.13.1.2.3.1.1, then the revised bid shall be used in place of the submitted bid; if the Market Participant withdrew the bid pursuant to Section III.13.1.2.3.1.1, then the capacity associated with the withdrawn bid shall be entered into the auction pursuant to Section III.13.2.3.2(c). If the amount of capacity associated with Export Bids for an interface exceeds the transfer limit of that interface (minus any accepted Administrative De-List Bids over that interface), then the set of Export Bids associated with that interface equal to the interface's transfer limit (minus any accepted Administrative De-List Bids over that interface) having the highest bid prices shall be included in the auction as described above;

capacity for which Export Bids are not included in the auction as a result of this provision shall be entered into the auction pursuant to Section III.13.2.3.2(c).

(ii) For Permanent De-List Bids and Retirement De-List Bids, the ISO will enter a Proxy De-List Bid into the appropriate rounds of the Forward Capacity Auction in the following circumstances: (1) if the Lead Market Participant has elected pursuant to Section III.13.1.2.4.1(a) to retire the resource or portion thereof, the resource has not been retained for reliability pursuant to Section III.13.1.2.3.1.5.1, the price specified in the Commission-approved de-list bid is less than the Forward Capacity Auction Starting Price, and the Internal Market Monitor has found a portfolio benefit pursuant to Section III.A.24; or (2) if the Lead Market Participant has elected conditional treatment pursuant to Section III.13.1.2.4.1(b), the resource has not been retained for reliability pursuant to Section III.13.1.2.3.1.5.1, and the price specified in the Commission-approved de-list bid is less than the price specified in the de-list bid submitted by the Lead Market Participant and less than the Forward Capacity Auction Starting Price. The Proxy De-List Bid shall be non-rationable and shall be equal in price and quantity to, and located in the same Capacity Zone as, the Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid, and shall be entered into the appropriate rounds of the Forward Capacity Auction such that the capacity associated with the Proxy De-List Bid will be included in the aggregate supply curves as described in Section III.13.2.3.3 until the Proxy De-List Bid clears in the Forward Capacity Auction, as described in Section III.13.2.5.2, and is removed from the aggregate supply curves. If the Lead Market Participant has elected conditional treatment pursuant to Section III.13.1.2.4.1(b), the resource has not been retained for reliability pursuant to Section III.13.1.2.3.1.5.1, and the Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid is equal to or greater than the de-list bid submitted by the Lead Market Participant, no Proxy De-List Bid shall be used and the Commission-approved de-list bid shall be entered in the Forward Capacity Auction pursuant to Section III.13.2.3.2(b)(i).

(iii) For purposes of this subsection (b), if an Internal Market Monitor-determined price has been established for a Static De-List Bid and the associated resource's capacity is pivotal pursuant to Sections III.A.23.1 and III.A.23.2, then (unless otherwise directed by the Commission) the lower of the Internal Market Monitor-determined price and any revised bid that is submitted pursuant to Section III.13.1.2.3.1.1 will be used in place of the initially submitted bid; provided, however, that if the bid was withdrawn pursuant to Section III.13.1.2.3.1.1, then the capacity associated with the withdrawn bid shall be entered into the auction pursuant to

Section III.13.2.3.2(c). If an Internal Market Monitor-determined price has been established for an Export Bid and the associated resource's capacity is pivotal pursuant to Sections III.A.23.1 and III.A.23.2, then the Internal Market Monitor-determined price (or price directed by the Commission) will be used in place of the submitted bid.

Any Static De-List Bid for ambient air conditions that has not been verified pursuant to Section III.13.1.2.3.2.4 shall not be subject to the provisions of this subsection (b).

(c) **Existing Capacity Resources Without De-List or Export Bids and Self-Supplied FCA Resources**. Each Existing Generating Capacity Resource, Existing Import Capacity Resource, and Existing Demand Capacity Resource without a Static De-List Bid, a Permanent De-List Bid, a Retirement De-List Bid, an Export Bid or an Administrative Export De-List Bid in its Existing Capacity Qualification Package, and each existing Self-Supplied FCA Resource shall be automatically entered into each round of the Forward Capacity Auction at its FCA Qualified Capacity, such that the resource's FCA Qualified Capacity will be included in the aggregate supply curves as described in Section III.13.2.3.3, except where such resource, if permitted, submits an appropriate Dynamic De-List Bid, as described in Section III.13.2.3.2(d). Each new Self-Supplied FCA Resource shall be automatically entered into each round of the Forward Capacity Auction at its designated self-supplied quantity at prices at or above the resource's New Resource Offer Floor Price, such that the resource's designated self-supply quantity will be included in the aggregate supply curves as described in Section III.13.2.3.3.

(d) **Dynamic De-List Bids.** In any round of the Forward Capacity Auction in which prices are below the Dynamic De-List Bid Threshold, any Existing Generating Capacity Resource, Existing Import Capacity Resource, or Existing Demand Capacity Resource (but not any Self-Supplied FCA Resources) may submit a Dynamic De-List Bid at prices below the Dynamic De-List Bid Threshold. Such a bid shall be defined by the submission of one to five prices, each less than the Dynamic De-List Bid Threshold (or the Start-of-Round Price, if lower than the Dynamic De-List Bid Threshold) but greater than or equal to the End-of-Round Price, and a single quantity associated with each price. Such a bid shall be expressed in the same form as specified in Section III.13.2.3.2(a)(i) and shall imply a curve indicating quantities at all of that round's relevant prices, pursuant to the convention of Section III.13.2.3.2(a)(iii). The curve may in no case increase the quantity offered as the price decreases. A dynamic De-List Bid may not offer less capacity than the resource's Rationing Minimum Limit at any price, except where the amount of capacity offered is zero. All Dynamic De-List Bids are subject to a reliability review as described in Section III.13.2.5.2.5, and if not rejected for reliability reasons, shall be included in the round in the same

manner as Static De-List Bids as described in Section III.13.2.3.2(b). Where a resource elected pursuant to Section III.13.1.1.2.2.4 or Section III.13.1.4.1.1.2.7 to have the Capacity Supply Obligation and Capacity Clearing Price continue to apply after the Capacity Commitment Period associated with the Forward Capacity Auction in which the offer clears, the capacity associated with any resulting Capacity Supply Obligation may not be subject to a Dynamic De-List Bid in subsequent Forward Capacity Auctions for Capacity Commitment Periods for which the Project Sponsor elected to have the Capacity Supply Obligation and Capacity Clearing Price continue to apply. Where a Lead Market Participant submits any combination of Dynamic De-List Bid, Static De-List Bid, Export Bid, and Administrative Export De-List Bid for a single resource, none of the prices in a set of price-quantity pairs associated with a bid may be the same as any price in any other set of price-quantity pairs associated with another bid for the same resource.

(e) **Repowering**. Offers and bids associated with a resource participating in the Forward Capacity Auction as a New Generating Capacity Resource pursuant to Section III.13.1.1.1.2 (resources previously counted as capacity resources) shall be addressed in the Forward Capacity Auction in accordance with the provisions of this Section III.13.2.3.2(e). The Project Sponsor shall offer such a New Generating Capacity Resource into the Forward Capacity Auction in the same manner and pursuant to the same rules as other New Generating Capacity Resources, as described in Section III.13.2.3.2(a). As long as any capacity is offered from the New Generating Capacity Resource, the amount of capacity offered is the amount that the auctioneer shall include in the aggregate supply curve at the relevant prices, and the quantity of capacity offered from the associated Existing Generating Capacity Resource shall not be included in the aggregate supply curve. If any portion of the New Generating Capacity Resource clears in the Forward Capacity Auction, the associated Existing Generating Capacity Resource shall be permanently de-listed as of the start of the associated Capacity Commitment Period. If at any price, no capacity is offered from the New Generating Capacity Resource, then the auctioneer shall include capacity from the associated Existing Generating Capacity Resource at that price, subject to any bids submitted and accepted in the qualification process for that Existing Generating Capacity Resource pursuant to Section III.13.1.2.5. Bids submitted and accepted in the qualification process for an Existing Generating Capacity Resource pursuant to Section III.13.1.2.5 shall only be entered into the Forward Capacity Auction after the associated New Generating Capacity Resource is fully withdrawn (that is, the Forward Capacity Auction reaches a price at which the resource's New Capacity Offer is zero capacity), and shall only then be subject to the reliability review described in Section III.13.2.5.2.5.

(f) **Conditional Qualified New Resources.** Offers associated with a resource participating in the Forward Capacity Auction as a Conditional Qualified New Resource pursuant to Section III.13.1.1.2.3(f) shall be addressed in the Forward Capacity Auction in accordance with the provisions of this Section III.13.2.3.2(f). The Project Sponsor shall offer such a Conditional Qualified New Resource into the Forward Capacity Auction in the same manner and pursuant to the same rules as other New Generating Capacity Resources, as described in Section III.13.2.3.2(a). An offer from at most one resource at a Conditional Qualified New Resource's location will be permitted to clear (receive a Capacity Supply Obligation for the associated Capacity Commitment Period) in the Forward Capacity Auction. As long as a positive quantity is offered at the End-of-Round Price in the final round of the Forward Capacity Auction by the resource having a higher queue priority at the Conditional Qualified New Resource's location, as described in Section III.13.1.1.2.3(f), then no capacity from the Conditional Qualified New Resource shall clear. If at any price greater than or equal to the End-of-Round Price in the final round of the Forward Capacity Auction, zero quantity is offered from the resource having higher queue priority at the Conditional Qualified New Resource's location, as described in Section III.13.1.1.2.3(f), then the auctioneer shall consider capacity offered from the Conditional Qualified New Resource in the determination of clearing, including the application of Section III.13.2.7.

(g) **Mechanics**. Offers and bids that may be submitted during a round of the Forward Capacity Auction must be received between the starting time and ending time of the round, as announced by the auctioneer in advance. The ISO at its sole discretion may authorize a participant in the auction to complete or correct its submission after the ending time of a round, but only if the participant can demonstrate to the ISO's satisfaction that the participant was making reasonable efforts to complete a valid offer submission before the ending time of the round, and only if the ISO determines that allowing the completion or correction will not unreasonably disrupt the auction process. All decisions by the ISO concerning whether or not a participant may complete or correct a submission after the ending time of a round are final.

III.13.2.3.3. Step 3: Determination of the Outcome of Each Round.

The auctioneer shall use the offers and bids for the round as described in Section III.13.2.3.2 to determine the aggregate supply curves for the New England Control Area and for each modeled Capacity Zone included in the round.

The aggregate supply curve for the New England Control Area, the Total System Capacity, shall reflect at each price the sum of the following:

(1) the amount of capacity offered in all Capacity Zones modeled as import-constrained Capacity Zones at that price (excluding capacity offered from New Import Capacity Resources and Existing Import Capacity Resources);

(2) the amount of capacity offered in the Rest-of-Pool Capacity Zone at that price (excluding capacity offered from New Import Capacity Resources and Existing Import Capacity Resources);

(3) for each Capacity Zone modeled as an export-constrained Capacity Zone, the lesser of:

  (i) the amount of capacity offered in the Capacity Zone at that price (including the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources for each interface between the New England Control Area and an external Control Area mapped to the export-constrained Capacity Zone up to that interface's approved capacity transfer limit (net of tie benefits), or;

  (ii) the amount of capacity determined by the Capacity Zone Demand Curve at zero minus that price, and;

(4) for each interface between the New England Control Area and an external Control Area mapped to an import-constrained Capacity Zone or the Rest-of-Pool Capacity Zone, the lesser of:

  (i) that interface's approved capacity transfer limit (net of tie benefits), or;

  (ii) the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources.

In computing the Total System Capacity, capacity associated with any New Capacity Offer at any price greater than the Forward Capacity Auction Starting Price will not be included in the tally of total capacity at the Forward Capacity Auction Starting Price for that Capacity Zone. On the basis of these aggregate supply curves, the auctioneer shall determine the outcome of the round for each modeled Capacity Zone as follows:

(a) **Import-Constrained Capacity Zones.**

For a Capacity Zone modeled as an import-constrained Capacity Zone, if either of the following two conditions is met during the round:

(1) the aggregate supply curve for the import-constrained Capacity Zone, adjusted as necessary in accordance with Section III.13.2.6 (Capacity Rationing Rule), equals or is less than the quantity determined by the Capacity Zone Demand Curve at the difference between the End-of-Round Price and the price specified by the System-Wide Capacity Demand Curve (at a quantity no less than Total System Capacity at the Start-of-Round Price), or;

(2) the Forward Capacity Auction is concluded for the Rest-of-Pool Capacity Zone;

then the Forward Capacity Auction for that Capacity Zone is concluded and such Capacity Zone will not be included in further rounds of the Forward Capacity Auction.

The Capacity Clearing Price for that Capacity Zone shall be set at the greater of: (1) the sum of the price specified by the Capacity Zone Demand Curve at the amount of capacity equal to the total amount that is awarded a Capacity Supply Obligation in the import-constrained Capacity Zone, and the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, or; (2) the highest price of any offer or bid for a resource in the Capacity Zone that is awarded a Capacity Supply Obligation, subject to the other provisions of this Section III.13.2.

If neither of the two conditions above are met in the round, then the auctioneer shall publish the quantity of capacity in the Capacity Zone from Demand Capacity Resources by type at the End-of-Round Price, and that Capacity Zone will be included in the next round of the Forward Capacity Auction.

(b) **Rest-of-Pool Capacity Zone**.

If the Total System Capacity at the End-of-Round Price, adjusted as necessary in accordance with Section III.13.2.6 (Capacity Rationing Rule), and adjusted to include the additional supply in the import-constrained Capacity Zone that may be cleared at a higher price, equals or is less than the amount of capacity determined by the System-Wide Capacity Demand Curve, then the Forward Capacity Auction for the Rest-of-Pool Capacity Zone is concluded and the Rest-of-Pool Capacity Zone will not be included in further rounds of the Forward Capacity Auction.

The Capacity Clearing Price for the Rest-of-Pool Capacity Zone shall be set at the highest price at which the Total System Capacity is less than or equal to the amount of capacity determined by the System-Wide Capacity Demand Curve, subject to the other provisions of this Section III.13.2.

If the Forward Capacity Auction for the Rest-of-Pool Capacity Zone is not concluded then the Rest-of-Pool Capacity Zone will be included in the next round of the Forward Capacity Auction, and the auctioneer shall publish the Total System Capacity at the End-of-Round Price, adjusted to include the additional supply in the import-constrained Capacity Zone that may be cleared at a higher price, less the amount of capacity determined by the System-Wide Capacity Demand Curve at the End-of-Round Price, and also shall publish the quantity of capacity from Demand Capacity Resources by type at the End-of-Round Price.

(c) **Export-Constrained Capacity Zones**. For a Capacity Zone modeled as an export-constrained Capacity Zone, if both of the following two conditions are met during the round:

(1) the aggregate supply curve for the export-constrained Capacity Zone, adjusted as necessary in accordance with Section III.13.2.6 (Capacity Rationing Rule), is equal to or less than the maximum amount of capacity determined by the Capacity Zone Demand Curve at a price of zero, and;

(2) the Forward Capacity Auction is concluded for the Rest-of-Pool Capacity Zone;

then the Forward Capacity Auction for that Capacity Zone is concluded and such Capacity Zone will not be included in further rounds of the Forward Capacity Auction.

The Capacity Clearing Price for that Capacity Zone shall be set at the greater of: (1) the sum of the price specified by the Capacity Zone Demand Curve at the amount of capacity equal to the total amount that is awarded a Capacity Supply Obligation in the export-constrained Capacity Zone, and the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, or; (2) the highest price of any offer or bid for a resource in the Capacity Zone that is awarded a Capacity Supply Obligation, and subject to the other provisions of this Section III.13.2.

If it is not the case that both of the two conditions above are satisfied in the round, then the auctioneer shall publish the quantity of excess supply in the export-constrained Capacity Zone at the End-of-Round Price (the amount of capacity offered at the End-of-Round Price in the export-

constrained Capacity Zone minus the maximum amount of capacity determined by the Capacity Zone Demand Curve at a price of zero) and the quantity of capacity in the Capacity Zone from Demand Capacity Resources by type at the End-of-Round Price, and that Capacity Zone will be included in the next round of the Forward Capacity Auction.

(d) **Treatment of Import Capacity.** Where the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over an interface between the New England Control Area and an external Control Area is less than or equal to that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the capacity offers from those resources shall be treated as capacity offers in the modeled Capacity Zone associated with that interface. Where the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over an interface between the New England Control Area and an external Control Area is greater than that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the following provisions shall apply (separately for each such interface):

(i) For purposes of determining which capacity offers from the New Import Capacity Resources and Existing Import Capacity Resources over the interface shall clear and at what price, the offers over the interface shall be treated in the descending-clock auction as if they comprised a separately-modeled export-constrained capacity zone, with an aggregate supply curve consisting of the offers from the New Import Capacity Resources and Existing Import Capacity Resources over the interface.

(ii) The amount of capacity offered over the interface that will be included in the aggregate supply curve of the modeled Capacity Zone associated with the interface shall be the lesser of the following two quantities: the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over the interface; and the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF).

(iii) The Forward Capacity Auction for New Import Capacity Resources and Existing Import Capacity Resources over the interface is concluded when the following two conditions are both satisfied: the amount of capacity offered from New Import Capacity Resource and Existing Import Capacity Resources over the interface is less than or equal to the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-

TF); and the Forward Capacity Auction is concluded in the modeled Capacity Zone associated with the interface.

(e) **Treatment of Export Capacity.** Any Export Bid or any Administrative Export De-List Bid that is used to export capacity through an export interface connected to an import-constrained Capacity Zone from another Capacity Zone, or through an export interface connected to the Rest-of-Pool Capacity Zone from an export-constrained Capacity Zone in the Forward Capacity Auction will be modeled in the Capacity Zone where the export interface that is identified in the Existing Capacity Qualification Package is located. The Export Bid or Administrative Export De-List Bid clears in the Capacity Zone where the Export Bid or Administrative Export De-List Bid is modeled.

(i) Then the MW quantity equal to the relevant Export Bid or Administrative Export De-List Bid from the resource associated with the Export Bid or Administrative Export De-List Bid will be de-listed in the Capacity Zone where the resource is located. If the export interface is connected to an import-constrained Capacity Zone, the MW quantity procured will be in addition to the amount of capacity determined by the Capacity Zone Demand Curve for the import-constrained Capacity Zone.

(ii) If the Export Bid or Administrative Export De-List Bid does not clear, then the resource associated with the Export Bid or Administrative Export De-List Bid will not be de-listed in the Capacity Zone where the resource is located.

III.13.2.3.4. Determination of Final Capacity Zones.

(a) For all Forward Capacity Auctions up to and including the sixth Forward Capacity Auction (for the Capacity Commitment Period beginning June 1, 2015), after the Forward Capacity Auction is concluded for all modeled Capacity Zones, the final set of distinct Capacity Zones that will be used for all purposes associated with the relevant Capacity Commitment Period, including for the purposes of reconfiguration auctions and Capacity Supply Obligation Bilaterals, shall be those having distinct Capacity Clearing Prices as a result of constraints between modeled Capacity Zones binding in the running of the Forward Capacity Auction. Where a modeled constraint does not bind in the Forward Capacity Auction, and as a result adjacent modeled Capacity Zones clear at the same Capacity Clearing Price, those modeled Capacity Zones shall be a single Capacity Zone used for all purposes of the relevant Capacity Commitment Period, including for the purposes of reconfiguration auctions and Capacity Supply Obligation Bilaterals.

(b) For all Forward Capacity Auctions beginning with the seventh Forward Capacity Auction (for the Capacity Commitment Period beginning June 1, 2016) the final set of distinct Capacity Zones that will be used for all purposes associated with the relevant Capacity Commitment Period, including for the purposes of reconfiguration auctions and Capacity Supply Obligation Bilaterals, shall be those described in Section III.12.4.

III.13.2.4. Forward Capacity Auction Starting Price and the Cost of New Entry.

The Forward Capacity Auction Starting Price is max [1.6 multiplied by Net CONE, CONE]. References in this Section III.13 to the Forward Capacity Auction Starting Price shall mean the Forward Capacity Auction Starting Price for the Forward Capacity Auction associated with the relevant Capacity Commitment Period.

CONE for the Forward Capacity Auction for the Capacity Commitment Period beginning on June 1, 2021 is $11.35/kW-month.

Net CONE for the Forward Capacity Auction for the Capacity Commitment Period beginning on June 1, 2021 is $8.04/kW-month.

CONE and Net CONE shall be recalculated using updated data coincident with the recalculation of Offer Review Trigger Prices pursuant to Section III.A.21.1.2. Whenever these values are recalculated, the ISO will review the results of the recalculation with stakeholders and the new values will be filed with the Commission prior to the Forward Capacity Auction in which the new value is to apply.

Between recalculations, CONE and Net CONE will be adjusted for each Forward Capacity Auction pursuant to Section III.A.21.1.2(e). Prior to applying the annual adjustment for the Capacity Commitment Period beginning on June 1, 2019, Net CONE will be reduced by $0.43/kW-month to reflect the elimination of the PER adjustment. The adjusted CONE and Net CONE values will be published on the ISO's web site.

III.13.2.5. Treatment of Specific Offer and Bid Types in the Forward Capacity Auction.

III.13.2.5.1. Offers from New Generating Capacity Resources, New Import Capacity Resources, and New Demand Capacity Resources.

A New Capacity Offer (other than one from a Conditional Qualified New Resource) clears (receives a Capacity Supply Obligation for the associated Capacity Commitment Period) in the Forward Capacity Auction if the Capacity Clearing Price is greater than or equal to the price specified in the offer, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6. An offer from a Conditional Qualified New Resource clears (receives a Capacity Supply Obligation for the associated Capacity Commitment Period) in the Forward Capacity Auction, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6, if all of the following conditions are met: (i) the Capacity Clearing Price is greater than or equal to the price specified in the offer; (ii) capacity from that resource is considered in the determination of clearing as described in Section III.13.2.3.2(f); and (iii) such offer minimizes the costs for the associated Capacity Commitment Period, subject to Section III.13.2.7.7(c).

The amount of capacity that receives a Capacity Supply Obligation through the Forward Capacity Auction shall not exceed the quantity of capacity offered from the New Generating Capacity Resource, New Import Capacity Resource, or New Demand Capacity Resource at the Capacity Clearing Price.

III.13.2.5.2. Bids and Offers from Existing Generating Capacity Resources, Existing Import Capacity Resources, and Existing Demand Capacity Resources.

III.13.2.5.2.1. Permanent De-List Bids and Retirement De-List Bids.

(a) Except as provided in Section III.13.2.5.2.5, a Permanent De-List Bid, Retirement De-List Bid or Proxy De-List Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation) if the Capacity Clearing Price is less than or equal to the price specified in the bid, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6.

(b) Unless the capacity has been retained for reliability pursuant to Section III.13.2.5.2.5, if all or part of a resource with a Permanent De-List Bid or Retirement De-List Bid does not clear in the Forward Capacity Auction (receives a Capacity Supply Obligation), the Lead Market Participant shall enter the uncleared portion of the bid into the qualification process for the following Forward Capacity Auction as described in Section III.13.1.2.3.1.5.

(c) If the Capacity Clearing Price is greater than the price specified in a de-list bid submitted by a Lead Market Participant that elected conditional treatment for the de-list bid pursuant to Section III.13.1.2.4.1(b), and there is an associated Proxy De-List Bid that does not clear (receives a Capacity Supply Obligation), the resource will receive a Capacity Supply Obligation at the Capacity Clearing Price.

(d) The process by which the primary auction is cleared (but not the compilation of offers and bids pursuant to Sections III.13.2.3.1 and III.13.2.3.2) will be repeated after the substitution auction is completed if one of the following conditions is met: (1) if any Proxy De-List Bid entered as a result of a Lead Market Participant electing to retire pursuant to Section III.13.1.2.4.1(a) does not clear (receives a Capacity Supply Obligation) in the first run of the primary auction-clearing process and retains some portion of its Capacity Supply Obligation in the substitution auction; or (2) if any Proxy De-List Bid entered as a result of a Lead Market Participant electing conditional treatment pursuant to Section III.13.1.2.4.1(b) does not clear (receives a Capacity Supply Obligation) in the first run of the primary auction-clearing process, the de-list bid submitted by the Lead Market Participant is at or above the Capacity Clearing Price, and the Proxy De-List Bid retains some portion of its Capacity Supply Obligation in the substitution auction. The second run of the primary auction-clearing process: (i) excludes all Proxy De-List Bids, (ii) includes the offers and bids of resources compiled pursuant to Section III.13.2.3.2 that did not receive a Capacity Supply Obligation in the first run of the primary auction-clearing process but excluding the offers and bids, or portion thereof, associated with resources that acquired or shed a Capacity Supply Obligation in the substitution auction, and (iii) includes the capacity of resources, or portion thereof, that retain a Capacity Supply Obligation after the first run of the primary auction-clearing process and the substitution auction. The second run of the primary auction-clearing process shall not affect the Capacity Clearing Price of the Forward Capacity Auction (which is established by the first run of the primary auction-clearing process).

(e) Resources (other than those still subject to a multi-year Capacity Commitment Period election as described in Sections III.13.1.1.2.2.4 and III.13.1.4.1.1.2.7) that receive a Capacity Supply Obligation as a result of the first run of the primary auction-clearing process shall be paid the Capacity Clearing Price during the associated Capacity Commitment Period. Where the second run of the primary auction-clearing process procures additional capacity, the resulting price, paid during the associated Capacity Commitment Period (and subsequent Capacity Commitment Periods, as elected pursuant to Section III.13.1.1.2.2.4 or Section III.13.1.4.1.1.2.7) to the additionally procured capacity, shall be equal to or

greater than the adjusted price resulting from the first run of the primary auction-clearing process for that Capacity Zone.

III.13.2.5.2.2. Static De-List Bids and Export Bids.

Except as provided in Section III.13.2.5.2.5, a Static De-List Bid or an Export Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation for the associated Capacity Commitment Period) if the Capacity Clearing Price is less than or equal to the price specified in the bid, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6.

III.13.2.5.2.3. Dynamic De-List Bids.

A Dynamic De-List Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation for the associated Capacity Commitment Period) if the Capacity Clearing Price is less than or equal to the price specified in the bid, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6. If more Dynamic De-List Bids are submitted at a price than are needed to clear the market, such Dynamic De-List Bids shall be cleared pro-rata, but in no case less than a resource's Rationing Minimum Limit.

III.13.2.5.2.4. Administrative Export De-List Bids.

An Administrative Export De-List Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation for the associated Capacity Commitment Period) regardless of the Capacity Clearing Price.

III.13.2.5.2.5. Reliability Review.

The ISO shall review each Retirement De-List Bid, Permanent De-List Bid, Static De-List Bid, Export Bid, Administrative Export De-List Bid, Dynamic De-List Bid, and substitution auction demand bid to determine whether the capacity associated with that bid is needed for reliability reasons during the Capacity Commitment Period associated with the Forward Capacity Auction; Proxy De-List Bids shall not be reviewed.

(a) The reliability review will be conducted in descending price order using the price as finalized during qualification or as otherwise directed by the Commission. Bids with the same price will be reviewed in the order that produces the least negative impact to reliability; where bids are the same price and provide the same impact to reliability, they will be reviewed based on their submission time. If bids with the same price are from a single generating station, they will be reviewed in an order that seeks to

provide (1) the least-cost solution under Section III.13.2.5.2.5.1(d) and (2) the minimum aggregate quantity required for reliability from the generating station. The capacity shall be deemed needed for reliability reasons if the absence of the capacity would result in the violation of any NERC or NPCC criteria, or ISO New England System Rules. Bids shall only be rejected pursuant to this Section III.13.2.5.2.5 for the sole purpose of addressing a local reliability issue, and shall not be rejected solely on the basis that acceptance of the bid may result in the procurement of less capacity than the Installed Capacity Requirement (net of HQICCs) or the Local Sourcing Requirement for a Capacity Zone.

(b) If a Retirement De-List Bid, Permanent De-List Bid, Static De-List Bid, Export Bid, Administrative Export De-List Bid, or Dynamic De-List Bid would otherwise clear in the Forward Capacity Auction, but the ISO has determined that some or all of the capacity associated with the de-list bid is needed for reliability reasons, then the de-list bid having capacity needed for reliability will not clear in the Forward Capacity Auction. If the ISO has determined that some or all of the capacity associated with a demand bid is needed for reliability reasons, then the entire demand bid will not be included in the substitution auction.

(c) The Lead Market Participant shall be notified that its bid did not clear for reliability reasons at the later of: (i) immediately after the end of the Forward Capacity Auction round in which the auction price reaches the price of the de-list bid; or (ii) as soon as practicable after the time at which the ISO has determined that the bid must be rejected for reliability reasons. In no event, however, shall a Lead Market Participant be notified that a bid submitted pursuant to Section III.13.1.2.5 and accepted in the qualification process for an Existing Generating Capacity Resource did not clear for reliability reasons if the associated New Generating Capacity Resource remains in the Forward Capacity Auction. In such a case, the Lead Market Participant shall be notified that its bid did not clear for reliability reasons at the later of: (i) immediately after the end of the Forward Capacity Auction round in which the auction price reaches the price of the bid; (ii) immediately after the end of the Forward Capacity Auction round in which the associated New Generating Capacity Resource is fully withdrawn (that is, the Forward Capacity Auction reaches a price at which the resource's New Capacity Offer is zero capacity); or (iii) as soon as practicable after the time at which the ISO has determined that the bid must be rejected for reliability reasons.

(d) A resource that has a de-list bid rejected for reliability reasons shall be compensated pursuant to the terms set out in Section III.13.2.5.2.5.1 and shall have a Capacity Supply Obligation as described in Section III.13.6.1.

(e) The ISO shall review the results of each annual reconfiguration auction and determine whether the reliability need which caused the ISO to reject the de-list bid has been met through the annual reconfiguration auction. The ISO may also attempt to address the reliability concern through other reasonable means (including transmission enhancements).

(f) If the reliability need that caused the ISO to reject a de-list bid is met through a reconfiguration auction or other means, the resource shall retain its Capacity Supply Obligation through the end of the Capacity Commitment Period for which it was retained for reliability (provided that resources that have Permanent De-List Bids or Retirement De-List Bids rejected for reliability shall be permanently de-listed or retired as of the first day of the subsequent Capacity Commitment Period (or earlier if the resource sheds the entirety of the Capacity Supply Obligation as described in Section III.13.2.5.2.5.3(a)(ii) or Section III.13.2.5.2.5.3(b)(ii))).

(g) If a Permanent De-List Bid or a Retirement De-List Bid is rejected for reliability reasons, and the reliability need is not met through a reconfiguration auction or other means, that resource, or portion thereof, as applicable, is no longer eligible to participate as an Existing Capacity Resource in any reconfiguration auction, Forward Capacity Auction or Capacity Supply Obligation Bilateral for that and subsequent Capacity Commitment Periods. If the resource, or portion thereof, continues to be needed for reliability reasons, it shall be counted as capacity in the Forward Capacity Auction and shall be compensated as described in Section III.13.2.5.2.5.1.

(h) The ISO shall review with the Reliability Committee (i) the status of any prior rejected de-list bids reported to the Commission in an FCA results filing pursuant to Section 13.8.2, and (ii) the status of any Retirement De-List Bid or Permanent De-List Bid that has been rejected for reliability reasons and has elected to continue to operate, prior to the New Capacity Qualification Deadline in accordance with Section 4.1(c) of Attachment K of the ISO OATT.

If an identified reliability need results in the rejection of a Retirement De-List Bid, Permanent De-List Bid, Export Bid, Administrative Export De-List Bid, Static De-List Bid, or Dynamic De-List Bid while executing an FCA, the ISO shall (i) review each specific reliability need with the Reliability Committee in accordance with the timing provided for in the ISO New England Operating Documents and, (ii) update the current system Needs Assessments pursuant to Section 4.1(c) of Attachment K of the

ISO OATT. This review and update will follow ISO's filing of the FCA results with the Commission pursuant to Section 13.8.2.

III.13.2.5.2.5A Fuel Security Reliability Review

(a) This Section III.13.2.5.2.5A will remain in effect for the 2022/23, 2023/24 and 2024/25 Capacity Commitment Period, after which this Section III.13.2.5.2.5A will sunset.

(b) This Section III.13.2.5.2.5A will apply to (i) Retirement De-List Bids, (ii) substitution auction demand bids, and (iii) bilateral transactions and reconfiguration auctions demand bids submitted by an Existing Generating Capacity Resource that has been identified as being needed for fuel security during a Forward Capacity Auction. Terms set out in this Section III.13.2.5.2.5A will apply only for the period and resources described within this Section III.13.2.5.2.5A. Where the terms and conditions in this Section III.13.2.5.2.5A differ from terms otherwise set out in Section III.13, the terms of this Section III.13.2.5.2.5A will control for the period and circumstances described in Section III.13.2.5.2.5A.

(c) A fuel security reliability review for the Forward Capacity Market will be performed pursuant to Appendix L to Section III of the Tariff, and in accordance with the inputs and methodology set out to establish the fuel security reliability standard in Appendix I of Planning Procedure No. 10.

(d) For fuel security reliability reviews performed for the primary Forward Capacity Auction, the fuel security reliability review will be performed after the Existing Capacity Retirement Deadline and conducted in descending price order using the price as submitted in the Retirement De-List Bids. Bids with the same price will be reviewed in the order that produces the least negative impact to reliability. Where multiple bids have the same price and the retirement of the Existing Generating Capacity Resources would have the same impact to reliability, they will be reviewed based on their submission time. If bids with the same price are from a single generating station, they will be reviewed in an order that seeks to provide (1) the least-cost solution under Section III.13.2.5.2.5.1(d), and (2) the minimum aggregate quantity required for reliability from the generating station. An Existing Generating Capacity Resource may be needed for both fuel security and for transmission security pursuant to Section III.13.2.5.2.5. The fuel security reliability review will be performed in advance of the reliability review for transmission security. Where an Existing Generating Capacity Resource is needed for both fuel security reasons pursuant to this Section III.13.2.5.2.5A, and transmission security reliability reasons

pursuant to Section III.13.2.5.2.5, the generator will be retained for fuel security for purposes of cost allocation.

(e) If an Existing Generating Capacity Resource is identified as being needed for fuel security reasons, and the reliability need is not met through a reconfiguration auction or other means, that resource, or portion thereof, as applicable may not participate in Annual Reconfiguration Auctions for the Capacity Commitment Period(s) for which it is needed for fuel security, or earlier 2022/23, 2023/24 and 2024/25 Capacity Commitment Periods. Such an Existing Generating Capacity Resource that is identified as being needed for fuel security may participate in monthly bilateral transactions and monthly reconfiguration auctions, but may not submit monthly bilateral transactions for December, January or February, or demand bids for the December, January, or February monthly reconfiguration auctions for any period for which they have been identified as being needed for fuel security.

(f) Participants that have submitted a Retirement De-List Bid will be notified by ISO New England if their resource is needed for fuel security reliability reasons no later than 90 days after the Existing Capacity Retirement Deadline. Participants that have submitted a substitution auction demand bid, and where the demand bid has been rejected for reliability reasons, will be notified after the relevant Forward Capacity Auction has been completed.

(g) Where a Retirement De-List Bid would otherwise clear in the Forward Capacity Auction, but the ISO has determined that some or all of the capacity associated with the de-list bid is needed for fuel security reliability reasons, the provisions of III.13.2.5.2.5(b) shall apply.

(h) Existing Generating Capacity Resources that have had their Retirement De-list Bid rejected for fuel security reliability reasons and that do not elect to unconditionally or conditionally retire shall be eligible for compensation pursuant to Section III.13.2.5.2.5.1, except that the difference between payments based on resource de-list bids or cost-of-service compensation as detailed in Section III.13.2.5.2.5.1 and payments based on the Capacity Clearing Price for the Forward Capacity Market under this Section III.13.2.5.2.5.1 shall be allocated on a regional basis to Real Time Load Obligation, excluding Real-Time Load Obligation associated with Dispatchable Asset Related Demand Resources (DARD Pumps and other electric storage based DARDs) and Real-Time Load Obligation associated with Coordinated External Transactions, allocated and collected over a 12 month period. Resources that that are identified as needed for fuel security reliability reasons will have their capacity entered into the Forward Capacity Auction pursuant to III.13.2.5.2.5(g) and III.13.2.3.2(b).

(i) Where an Existing Generating Capacity Resource elects a cost-of-service agreement pursuant to Section III.13.2.5.2.5.1 to address a fuel security reliability need, the term of such a cost-of-service agreement may not exceed two years, including renewal through evergreen provisions. A cost-of-service agreement entered into for the 2024/2025 Capacity Commitment Period shall be limited to a total duration of one year.

(j) The ISO shall perform an annual reevaluation of any Existing Generating Capacity Resources retained for reliability under this provision. If a resource associated with a Retirement De-List Bid that was rejected for reliability reasons pursuant to this section, is found to no longer be needed for fuel security, and is not needed for another reliability reason pursuant to Section III.13.2.5.2.5, the resource will be retired from the system as described in Section III.13.2.5.2.5.3(a)(1). In no case will a resource retained for fuel security be retained for fuel security beyond June 1, 2025.

(k) The ISO will review Retirement De-List Bids rejected for fuel security reliability reasons with the Reliability Committee in the same manner as described in Section III.13.2.5.2.5(h).

III.13.2.5.2.5.1. Compensation for Bids Rejected for Reliability Reasons.

(a) In cases where a Static De-List Bid, Export Bid, Administrative Export De-List Bid, Dynamic De-List Bid, partial Permanent De-List Bid, or partial Retirement De-List Bid has been rejected for reliability reasons pursuant to Sections III.13.1.2.3.1.5.1 or III.13.2.5.2.5, the resource will be paid by the ISO in the same manner as all other capacity resources, except that payment shall be made on the basis of its de-list bid as accepted for the Forward Capacity Auction for the relevant Capacity Commitment Period instead of the Forward Capacity Market Clearing Price. Under this Section, accepted Dynamic De-List Bids filed with the Commission as part of the FCA results filing are subject to review and approval by the Commission pursuant to the "just and reasonable" standard of Section 205 of the Federal Power Act. If a resource with a partial Permanent De-List Bid or partial Retirement De-List Bid continues to be needed for reliability in Capacity Commitment Periods following the Capacity Commitment Period for which the partial Permanent De-List Bid or partial Retirement De-List Bid was rejected, payment will continue to be pursuant to this Section III.13.2.5.2.5.1(a).

(b) In cases where a Permanent De-List Bid or a Retirement De-List Bid for the capacity of an entire resource has been rejected for reliability reasons pursuant to Section III.13.1.2.3.1.5.1 or III.13.2.5.2.5, the resource will be paid either (i) in the same manner as all other capacity resources, except that payment

shall be made on the basis of its Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid for the relevant Capacity Commitment Period instead of the Forward Capacity Market Clearing Price or (ii) under the terms of a cost-of-service agreement pursuant to Section III, Appendix I. Resources must notify the ISO of their election within six months after the ISO files the results of the relevant Forward Capacity Auction with the Commission. A resource that has had a Permanent De-List Bid or Retirement De-List Bid rejected for reliability reasons and does not notify the ISO of its election as described in this paragraph will be paid on the basis of the resource's Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid. Cost-of-service agreements must be filed with and approved by the Commission, and cost-of-service compensation may not commence until the Commission has approved the use of cost-of-service rates for the unit in question or has accepted the use of the cost-of-service rates subject to refund while the rate is reviewed. In no event will payment under the cost-of-service agreement start prior to the start of the relevant Capacity Commitment Period for which the Permanent De-List Bid or Retirement De-List Bid was submitted. If a resource continues to be needed for reliability in Capacity Commitment Periods following the Capacity Commitment Period for which the Permanent De-List Bid or Retirement De-List Bid was rejected, payment will continue to be pursuant to this Section III.13.2.5.2.5.1(b). Resources that elect payment based on the Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid may file with the Commission pursuant to Section 205 of the Federal Power Act to update its Permanent De-List Bid or Retirement De-List Bid if the unit is retained for reliability for a period longer than the Capacity Commitment Period for which the Permanent De-List Bid or Retirement De-List Bid was originally submitted.

(c) The difference between payments based on resource de-list bids or cost-of-service compensation as detailed in this Section III.13.2.5.2.5.1 and payments based on the market clearing price for the Forward Capacity Market under this Section III.13.2.5.2.5.1 shall be allocated to Regional Network Load within the affected Reliability Region.

(d) **Compensation for Existing Generating Capacity Resources at Stations with Common Costs that are Retained for Reliability**. If a Static De-List Bid, Permanent De-List Bid, or Retirement De-List Bid from an Existing Generating Capacity Resource that is associated with a Station having Common Costs is rejected for reliability reasons, the Existing Generating Capacity Resource will be paid as follows: (i) if one or more Existing Generating Capacity Resources at the Station assume a Capacity Supply Obligation through the normal clearing of the Forward Capacity Auction and one or more Existing Generating Capacity Resources are retained for reliability, then the Existing Generating Capacity

Resources retained for reliability will be paid the sum of the Asset-Specific Going Forward Costs for the assets comprising that Existing Generating Capacity Resource; or (ii) if no Existing Generating Capacity Resources at the Station assumes a Capacity Supply Obligation through the normal clearing of the Forward Capacity Auction and one or more Existing Generating Capacity Resources are retained for reliability, then each Existing Generating Capacity Resource retained for reliability will be paid the sum of the Asset-Specific Going Forward Costs for the assets associated with that Existing Generating Capacity Resource plus a portion of the Station Going Forward Common Costs (such that the full amount of Station Going Forward Common Costs are allocated to the Existing Generating Capacity Resources retained for reliability).

(e) If ISO-NE is a party to a cost-of-service agreement filed after January 1, 2019 that changes any resource performance-related obligations contained in Section III, Appendix I (provided that those obligations are different than the obligations of an Existing Generating Capacity Resource with a Capacity Supply Obligation), no later than 30 days after such agreement is filed with the Commission, ISO-NE shall provide to stakeholders quantitative and qualitative information on the need for, and the impacts of, the proposed changes.

III.13.2.5.2.5.2. Incremental Cost of Reliability Service From Permanent De-List Bid or Retirement De-List Bid Resources.

In cases where an Existing Generating Capacity Resource or Existing Demand Capacity Resource has had a Permanent De-List Bid or Retirement De-List Bid for the entire resource rejected for reliability reasons pursuant to Sections III.13.1.2.3.1.5.1 or III.13.2.5.2.5, does not elect to retire pursuant to Section III.13.1.2.3.1.5.1(d), and must make a capital improvement to the unit to remain in operation in order to continue to operate to meet the reliability need identified by the ISO, the resource may make application to the Commission pursuant to Section 205 of the Federal Power Act to receive just and reasonable compensation of the capital investment pursuant to the following:

(a) **Notice to State Utility Commissions, the ISO and Stakeholder Committees of Expectation that a Capital Expense will be Necessary to Meet the Reliability Need Identified by the ISO**: A resource seeking to avail itself of the recovery mechanism provided in this Section must notify the state utility commissions in the states where rate payers will fund the capital improvement, the ISO, and the Participants Committee of its intent to make the capital expenditure and the need for the expenditure. This notification must be made at least 120 days prior to the resource making the capital expenditure.

(b) **Required Showing Made to the Federal Energy Regulatory Commission**: In order to receive just and reasonable compensation for a capital expenditure under this Section, a resource must file an explanation of need with the Commission that explains why the capital expenditure is necessary in order to meet the reliability need identified by the ISO. This showing must demonstrate that the expenditure is reasonably determined to be the least-cost commercially reasonable option consistent with Good Utility Practice to meet the reliability need identified by the ISO. If the resource elects cost-of-service treatment pursuant to Section III.13.2.5.2.5.1(b), the Incremental Cost of Reliability Service filing described in this Section must be made separately from and may be made in advance of the resource's cost-of-service filing.

(c) **Allocation:** Costs of capital expenditures approved by the Commission under this provision shall be allocated to Regional Network Load within the affected Reliability Region.

III.13.2.5.2.5.3. Retirement and Permanent De-Listing of Resources.

(a)(i) A resource, or portion thereof, will be retired coincident with the commencement of the relevant Capacity Commitment Period, or earlier as described in Section III.13.2.5.2.5.3(a)(ii), if the resource: (1) submitted a Retirement De-List Bid at or above the Forward Capacity Auction Starting Price and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; (2) submitted a Permanent De-List Bid or Retirement De-List Bid, elected to retire pursuant to Section III.13.1.2.4.1(a), and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; (3) elected conditional treatment pursuant to Section III.13.1.2.4.1(b) for a Retirement De-List Bid with a submitted price at or above the Capacity Clearing Price and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; or (4) had a Commission-approved Retirement De-List Bid clear in the Forward Capacity Auction. In the case of a Retirement De-List Bid rejected for reliability, if the reliability need that resulted in the rejection for reliability is met, the resource, or portion thereof, will be retired coincident with the end of Capacity Supply Obligation (or earlier as described in Section III.13.2.5.2.5.3(a)(ii)) unless the Commission directs that the obligation to retire be removed or the retirement date extended as part of an Incremental Cost of Reliability Service filing made pursuant to Section III.13.2.5.2.5.2. The interconnection rights, or relevant portion thereof, for the resource will terminate and the status of the resource, or portion thereof, will be converted to retired on the date of retirement, consistent with the provisions of Schedules 22 and 23 of the OATT.

(a)(ii) A resource, or portion thereof, that is to be retired pursuant to Section III.13.2.5.2.5.3(a)(i) may retire the resource, or portion thereof, earlier than the Capacity Commitment Period for which its

Retirement De-List Bid was submitted if it is able to transfer the relevant Capacity Supply Obligation of the resource to another resource through one or more approved Capacity Supply Obligation Bilateral transactions as described in Section III.13.5.1 or reconfiguration auctions as described in Section III.13.4.1. A resource, or portion thereof, electing to retire pursuant to this provision must notify the ISO in writing of its election to retire and the date of retirement. The interconnection rights, or relevant portion thereof, for the resource will terminate and the status of the resource, or portion thereof, will be converted to retired on the date of retirement, consistent with the provisions of Schedules 22 and 23 of the OATT.

(b)(i) A resource, or portion thereof, will be permanently de-listed from the Forward Capacity Market as of the relevant Capacity Commitment Period, or earlier as described in Section III.13.2.5.2.5.3(b)(ii), if the resource: (1) submitted an Internal Market Monitor-approved Permanent De-List Bid at or above the Forward Capacity Auction Starting Price and was not retained for reliablity pursuant to Section III.13.1.2.3.1.5.1; (2) elected conditional treatment pursuant to Section III.13.1.2.4.1(b) for a Permanent De-List Bid with a submitted price at or above the Capacity Clearing Price and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; or (3) had a Commission-approved Permanent De-List Bid clear in the Forward Capacity Auction. The CNR Capability interconnection rights, or relevant portion thereof, for the resource will be adjusted downward to reflect the Permanent De-List Bid, consistent with the provisions of Schedules 22 and 23 of the OATT. A resource that permanently de-lists pursuant to this Section III.13.2.5.2.5.3(b)(i) is precluded from subsequent participation in the Forward Capacity Market unless it qualifies as a New Generating Capacity Resource pursuant to Section III.13.1.1.1.2.

(b)(ii) A resource, or portion thereof, that is to be permanently de-listed pursuant to Section III.13.2.5.2.5.3(b)(i) may be permanently de-listed earlier than the Capacity Commitment Period for which its Permanent De-List Bid was submitted if it is able to transfer the entire Capacity Supply Obligation of the resource to another resource through one or more approved Capacity Supply Obligation Bilateral transactions as described in Section III.13.5.1 or reconfiguration auctions as described in Section III.13.4.

(c) A resource that has never been counted as a capacity resource may retire the asset by notifying the ISO in writing of its election to retire and the date of retirement. The date specified for retirement is subject to the limit for resource inactivity set out in Section III.13.2.5.2.5.3(d). The interconnection rights for the resource will terminate and the status of the resource will be converted to retired on the date of retirement.

(d) A resource that does not operate commercially for a period of three calendar years will be deemed by the ISO to be retired. The interconnection rights for the unit will terminate and the status of the unit will be converted to retired on the date of retirement. Where a generator has submitted an application to repower under Schedule 22 or 23 of the OATT, the current interconnection space will be maintained beyond the three years unless the application under Schedule 22 or 23 is withdrawn voluntarily or by the operation of those provisions. Where an application is withdrawn under Schedule 22 or 23, the three year period will be calculated from the last day of commercial operation of the resource.

III.13.2.6. Capacity Rationing Rule.

Except for Dynamic De-List Bids, Export Bids, and offers from New Import Capacity Resources that are subject to rationing pursuant to Section III.13.1.3.5.8 and Existing Import Capacity Resources that are subject to rationing pursuant to Section III.13.1.3.3.A, offers and bids in the Forward Capacity Auction must clear or not clear in whole, unless the offer or bid specifically indicates that it may be rationed. A resource may elect to be rationed to its Rationing Minimum Limit pursuant to Sections III.13.1.1.2.2.3 and III.13.1.2.1.2. Offers from New Import Capacity Resources and Existing Import Capacity Resources will not be rationed where such rationing would violate any applicable physical minimum flow requirements on the associated interface. Export Bids may elect to be rationed generally, but regardless of such election will always be subject to potential rationing where the associated external interface binds. If more Dynamic De-List Bids are submitted at a price than are needed to clear the market, the bids shall be cleared pro-rata, subject to honoring the Rationing Minimum Limit of the resources. Where an offer or bid may be rationed, such rationing may not result in procuring an amount of capacity that is below the associated resource's Rationing Minimum Limit.

III.13.2.7. Determination of Capacity Clearing Prices.

The Capacity Clearing Price in each Capacity Zone shall be the price established by the descending clock auction as described in Section III.13.2.3, subject to the other provisions of this Section III.13.2. The Capacity Clearing Price for the Rest-of-Pool Capacity Zone and the Capacity Clearing Price for each import-constrained Capacity Zone shall not exceed the Forward Capacity Auction Starting Price. The Capacity Clearing Price for an export-constrained Capacity Zone shall not be less than zero.

III.13.2.7.1. Import-Constrained Capacity Zone Capacity Clearing Price Floor.

The Capacity Clearing Price in an import-constrained Capacity Zone shall not be lower than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone. If after the Forward Capacity Auction is conducted, the

Capacity Clearing Price in an import-constrained Capacity Zone is less than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone, all resources clearing in the import-constrained Capacity Zone shall be paid based on the Capacity Clearing Price in the Rest-of-Pool Capacity Zone during the associated Capacity Commitment Period.

III.13.2.7.2. Export-Constrained Capacity Zone Capacity Clearing Price Ceiling.

The Capacity Clearing Price in an export-constrained Capacity Zone shall not be higher than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone. If after the Forward Capacity Auction is conducted, the Capacity Clearing Price in an export-constrained Capacity Zone is higher than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone, all resources clearing in the export-constrained Capacity Zone shall be paid based on the Capacity Clearing Price in the Rest-of-Pool Capacity Zone during the associated Capacity Commitment Period.

III.13.2.7.3. [Reserved.]

III.13.2.7.3A. Treatment of Imports.

At the Capacity Clearing Price, if the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over an interface between an external Control Area and the New England Control Area is greater than that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF):

(a) the full amount of capacity offered at that price from Existing Import Capacity Resources associated with contracts listed in Section III.13.1.3.3.A(c) shall clear, unless that amount of capacity is greater than the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), in which case the capacity offered at that price from Existing Import Capacity Resources associated with contracts listed in Section III.13.1.3.3.A(c) shall be rationed such that the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF) is not exceeded; and

(b) if there is space remaining over the interface after the allocation described in subsection (a) above, then the capacity offered at that price from New Import Capacity Resources and Existing Import Capacity Resources other than Existing Import Capacity Resources associated with the contracts listed in Section III.13.1.3.3.A(c) will be rationed such that the interface's

approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF) is not exceeded. If the capacity offered at that price by any single New Import Capacity Resource or Existing Import Capacity Resource that is not associated with the contracts listed in Section III.13.1.3.3.A(c) is greater than the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the capacity offered by that resource that is above the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF) shall not be included in the rationing.

III.13.2.7.4. Effect of Capacity Rationing Rule on Capacity Clearing Price.

Where the requirement that offers and bids clear or not clear in whole (Section III.13.2.6) prohibits the descending clock auction in its normal progression from clearing one or more Capacity Zones at the precise amount of capacity determined by the Capacity Zone Demand Curves specified in Section III.13.2.2, then the auctioneer shall analyze the aggregate supply curve to determine cleared capacity offers and Capacity Clearing Prices that seek to maximize social surplus for the associated Capacity Commitment Period. The clearing algorithm may result in offers below the Capacity Clearing Price not clearing, and in de-list bids below the Capacity Clearing Price clearing.

III.13.2.7.5. Effect of Decremental Repowerings on the Capacity Clearing Price.

Where the effect of accounting for certain repowering offers and bids (as described in Section III.13.2.3.2(e)) results in the auction not clearing at the lowest price for the required quantity of capacity, then the auctioneer will conduct additional auction rounds of the Forward Capacity Auction as necessary to minimize capacity costs.

III.13.2.7.6. Minimum Capacity Award.

Each offer (excluding offers from Conditional Qualified New Resources that do not satisfy the conditions specified in Sections III.13.2.5.1(i)-(iii)) clearing in the Forward Capacity Auction shall be awarded a Capacity Supply Obligation at least as great as the amount of capacity offered at the End-of-Round Price in the final round of the Forward Capacity Auction. For Intermittent Power Resources, the Capacity Supply Obligation for months in the winter period (as described in Section III.13.1.5) shall be adjusted based on its winter Qualified Capacity as determined pursuant to Section III.13.1.1.2.2.6 and Section III.13.1.2.2.2.

III.13.2.7.7. Tie-Breaking Rules.

Where the provisions in this Section III.13.2 for clearing the Forward Capacity Auction (system-wide or in a single Capacity Zone) result in a tie – that is, where two or more resources offer sufficient capacity at prices that would clear the auction at the same minimum costs – the auctioneer shall apply the following rules (in sequence, as necessary) to determine clearing:

(a) [Reserved.]

(b) If multiple projects may be rationed, they will be rationed proportionately.

(c) Where clearing either the offer associated with a resource with a higher queue priority at a Conditional Qualified New Resource's location or the offer associated with the Conditional Qualified New Resource would result in equal costs, the offer associated with the resource with the higher queue priority shall clear.

(d) The offer associated with the Project Sponsor having the lower market share in the capacity auction (including Existing Generating Capacity Resources, Existing Import Capacity Resources, and Existing Demand Capacity Resources) shall be cleared.

III.13.2.8. Capacity Substitution Auctions.

III.13.2.8.1. Administration of Substitution Auctions.

Following the completion of the primary auction-clearing process of the Forward Capacity Auction as provided for in Section III.13.2, the ISO shall conduct a substitution auction, using a static double auction to clear supply offers (offers to assume a Capacity Supply Obligation) and demand bids (bids to shed a Capacity Supply Obligation). Supply offers and demand bids will be modeled in the Capacity Zone where the associated resources are electrically interconnected.

III.13.2.8.1.1. Substitution Auction Clearing and Awards.

The substitution auction shall maximize total social surplus as specified by the demand bids and supply offers used in the auction. The maximization is constrained as follows:

(i) By the external interface limits modeled in the primary auction-clearing process.

(ii) Such that the net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is equal to zero.

(iii) Such that, for each import-constrained Capacity Zone, if the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction is less than the zone threshold quantity specified below, then the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is equal to zero; otherwise, the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is greater than or equal to the zone threshold quantity specified below.

(iv) Such that, for each export-constrained Capacity Zone, if the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction is greater than the zone threshold quantity specified below, then the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is equal to zero; otherwise, the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is less than or equal to the zone threshold quantity specified below.

In applying constraint (iii), the zone threshold quantity for an import-constrained Capacity Zone shall be equal to the sum of its Capacity Zone Demand Curve truncation point quantity specified in Section III.13.2.2.2 and the total quantity of any Export Bids and any Administrative Export De-List for which the exporting resource is located outside the import-constrained Capacity Zone, that are used to export capacity across an external interface connected to the import-constrained Capacity Zone, and that cleared in the primary auction-clearing process of the Forward Capacity Auction.

In applying constraint (iv), the zone threshold quantity for an export-constrained Capacity Zone shall be equal to its Capacity Zone Demand Curve truncation point quantity specified in Section III.13.2.2.3 less the total quantity of any Export Bids and any Administrative Export De-List Bids for which the exporting resource is located in the export-constrained Capacity Zone, that are used to export capacity across an external interface connected to either the Rest-of-Pool Capacity Zone or an import-constrained Capacity Zone, and that cleared in the primary auction-clearing process of the Forward Capacity Auction.

In applying constraints (iii) and (iv), a zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction and net cleared Capacity Supply Obligations

(total acquired less total shed) in the substitution auction shall include the Capacity Supply Obligations of Import Capacity Resources at each external interface connected to the Capacity Zone.

In cases in which there are multiple clearing outcomes that would each maximize the substitution auction's objective, the following tie-breaking rules will apply in the following sequence: (i) non-rationable demand bids associated with Lead Market Participants having the largest total FCA Qualified Capacity of Existing Capacity Resources will be cleared first; and (ii) rationable supply offers and demand bids associated with Proxy De-List Bids will be cleared in proportion to their offer or bid quantity.

For Intermittent Power Resources, other than those participating as the summer resource in a Composite FCM Transaction, the cleared award for supply offers and demand bids shall be adjusted for the months in the winter period (as described in Section III.13.1.5) using the ratio of the resource's cleared offer or bid amount divided by its FCA Qualified Capacity multiplied by its winter Qualified Capacity as determined pursuant to Section III.13.1.1.2.2.6 and Section III.13.1.2.2.2. Provided the resource's winter Qualified Capacity is not zero, the pro-rata adjustment will add to the amount of the cleared offer or bid award for the months in the winter period.

The cleared offer amount awarded to a Composite FCM Transaction in the substitution auction will be assigned to the summer and winter resources for their respective obligation months during the Capacity Commitment Period as described in Section III.13.1.5.

If, after the substitution auction, a resource has a Capacity Supply Obligation below its Economic Minimum Limit, it must meet the requirements of Section III.13.6.1.1.1.

III.13.2.8.1.2. Substitution Auction Pricing.

The substitution auction will specify clearing prices for Capacity Zones and external interfaces as follows.

For each import-constrained Capacity Zone, if the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is greater than its zone threshold quantity specified in Section III.13.2.8.1.1, then supply offers and demand bids in the substitution auction in the import-constrained Capacity Zone shall be treated as offers and bids in the Rest-of-Pool Capacity Zone for purposes of determining substitution auction clearing prices.

For each export-constrained Capacity Zone, if the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is less than its zone threshold quantity specified in Section III.13.2.8.1.1, then supply offers and demand bids in the substitution auction in the export-constrained Capacity Zone shall be treated as offers and bids in the Rest-of-Pool Capacity Zone for purposes of determining substitution auction clearing prices.

The substitution auction clearing prices for the Rest-of-Pool Capacity Zone and for any constrained zones pooled with the Rest-of-Pool Capacity Zone for pricing purposes shall be determined by the price of the demand bid or supply offer that is marginal. If a demand bid associated with a Proxy De-List Bid is marginal, then the substitution auction clearing prices shall be set equal to the Capacity Clearing Prices.

The substitution auction clearing price for a constrained Capacity Zone that is not pooled with the Rest-of-Pool Capacity Zone for pricing purposes shall be determined by the price of the demand bid or supply offer associated with the separately-priced constrained Capacity Zone that is marginal. If a demand bid associated with a Proxy De-List Bid is marginal, then the substitution auction clearing price shall be set equal to the Capacity Clearing Price.

If the net quantity of Capacity Supply Obligations awarded in the primary Forward Capacity Auction and substitution auction over an interface between the New England Control Area and an external Control Area is less than that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then supply offers and demand bids in the substitution auction at the interface shall be treated as offers and bids in the modeled Capacity Zone associated with that interface for purposes of determining substitution auction clearing prices.

If the net quantity of Capacity Supply Obligations awarded in the primary Forward Capacity Auction and substitution auction over an interface between the New England Control Area and an external Control Area is equal to that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the substitution auction clearing price for that interface will be determined by the demand bid or supply offer that is marginal at that interface. If a cleared demand bid associated with a Proxy De-List Bid is marginal at the external interface, then the substitution auction clearing price for that interface shall be set equal to the Capacity Clearing Price for that interface.

The substitution auction clearing price at an external interface shall not exceed the substitution auction clearing price in the Capacity Zone connected to the external interface.

If, pursuant to the rules specified above, the substitution auction clearing price for any Capacity Zone or external interface would exceed the Capacity Clearing Price for that location, the substitution auction clearing price for that location only is set equal to its Capacity Clearing Price.

The substitution auction clearing price for any Capacity Zone or external interface cannot be less than negative one multiplied by the Forward Capacity Auction Starting Price.

III.13.2.8.2. Supply Offers in the Substitution Auction.

III.13.2.8.2.1. Supply Offers.

To participate as supply in the substitution auction, a Project Sponsor for a New Capacity Resource must meet the following criteria:

(a) The Project Sponsor and the New Capacity Resource must meet all the requirements for participation in the Forward Capacity Auction specified in Section III.13.1.

(b) The Project Sponsor must elect to have the resource participate in the substitution auction during the New Capacity Show of Interest Window. Pursuant to an election, the resource's total amount of FCA Qualified Capacity will be obligated to participate in the substitution auction, regardless of whether the resource's FCA Qualified Capacity was prorated pursuant to Section III.13.1.1.2.10, and subject to the other provisions of this Section III.13.2.8.2.

(c) The Project Sponsor must certify that the New Capacity Resource is a Sponsored Policy Resource as part of the submission of the New Capacity Qualification Package.

Substitution auction supply offers are rationable.

A resource participating in the Forward Capacity Auction as a New Generating Capacity Resource pursuant to Section III.13.1.1.1.2 (resources previously counted as capacity resources) is not eligible to participate as supply in the substitution auction.

A Composite FCM Transaction comprised of a summer resource that is a Sponsored Policy Resource is eligible to participate as supply in the substitution auction.

A Conditional Qualified New Resource may participate in the substitution auction provided that the resource with which it has overlapping interconnection impacts: (i) did not receive a Capacity Supply Obligation, fully or partially, in the primary auction-clearing process, and: (ii) is not eligible to participate in the substitution auction. A resource having a higher priority in the queue than a Conditional Qualified New Resource with which it has overlapping interconnection impact may participate in the substitution auction provided that the Conditional Qualified New Resource did not receive a Capacity Supply Obligation, fully or partially, in the primary auction-clearing process.

III.13.2.8.2.2. Supply Offer Prices.

Project Sponsors must submit substitution auction supply offer prices no later than five Business Days after the deadline for submission of offers composed of separate resources.

A substitution auction supply offer must be in the form of a curve (with up to five price-quantity pairs). The curve may not decrease in quantity as the price increases. A supply offer price for the substitution auction may not be greater than the Forward Capacity Auction Starting Price or lower than negative one multiplied by the Forward Capacity Auction Starting Price.

If the offer quantity does not equal the resource's FCA Qualified Capacity, the quantity for which no offer price was submitted will be assigned a price equal to the Forward Capacity Auction Starting Price.

III.13.2.8.2.3. Supply Offers Entered into the Substitution Auction

Supply offers for resources that satisfy all of the criteria in Section III.13.2.8.2.1 to participate in the substitution auction may be adjusted prior to conducting the substitution auction-clearing process using the following adjustments:

(a) Any portion of a resource's FCA Qualified Capacity that was cleared (received a Capacity Supply Obligation) in the primary auction-clearing process will be removed from the resource's substitution auction supply offer beginning with the lowest priced price-quantity pairs.

(b) After performing the adjustment specified in Section III.13.2.8.2.3(a), any price-quantity pairs in a resource's substitution auction supply offer with a price greater than the Capacity Clearing Price for the resource's Capacity Zone or external interface are removed from the offer.

III.13.2.8.3. Demand Bids in the Substitution Auction.

III.13.2.8.3.1. Demand Bids.

Market Participants with Existing Generating Capacity Resources or Existing Import Capacity Resources associated with External Elective Transmission Upgrades may elect to submit demand bids for the substitution auction for those resources by the Existing Capacity Retirement Deadline. The election must specify the total amount of the resource's Qualified Capacity that will be associated with its demand bid.

A resource must have achieved all of the milestones specified in Section III.13.1.1.2.2.2. no later than seven days after the issuance by the ISO of the qualification determination notification described in Section III.13.1.2.4(b) in order to participate as demand in the substitution auction.

Regardless of whether an election is made, a demand bid is required for any portion of a resource that is associated with a Retirement De-List Bid.

A resource for which a demand bid election has been made cannot participate in a Composite FCM Transaction and cannot be designated as a Self-Supplied FCA Resource.

Demand bids are non-rationable.

A demand bid will be entered into the substitution auction for the portion of the resource that receives a Capacity Supply Obligation in the primary auction-clearing process, subject to the other provisions of this Section III.13.2.8.3. A resource, or portion thereof, associated with a cleared demand bid shall be retired from all New England Markets (except that a resource, or portion thereof, associated with a cleared demand bid that is associated with a Proxy De-List Bid and a Permanent De-List Bid which has not been elected to retire pursuant to Section III.13.1.2.4.1(a) shall be retired only from the capacity market) at the start of the Capacity Commitment Period associated with the Forward Capacity Auction.

III.13.2.8.3.2. Demand Bid Prices.

Market Participants must submit substitution auction demand bid prices no later than five Business Days after the deadline for submission of offers composed of separate resources.

A substitution auction demand bid must be in the form of a curve (with up to five price-quantity pairs). The curve may not decrease in quantity as the price decreases. A demand bid price for the substitution

auction may not be greater than the Forward Capacity Auction Starting Price or lower than negative one multiplied by the Forward Capacity Auction Starting Price.

If the bid quantity does not equal the total bid amount submitted by the Market Participant or required for a Retirement De-List Bid pursuant to Section III.13.2.8.3.1, the quantity for which no bid price was specified will be assigned a price equal to negative one multiplied by the Forward Capacity Auction Starting Price.

III.13.2.8.3.3. Demand Bids Entered into the Substitution Auction.

If a resource is determined to be needed for reliability pursuant to Section III.13.2.5.2.5, then any demand bid associated with the resource will not be included in the substitution auction.

Demand bids for resources that satisfy all of the criteria in Section III.13.2.8.3.1 to participate in the substitution auction may be adjusted prior to conducting the substitution auction-clearing process using the following adjustments:

(a) Any portion of a resource's demand bid that exceeds its Capacity Supply Obligation awarded in the primary auction-clearing process will be removed from the substitution auction demand bid beginning with the highest priced price-quantity pairs.

(b) After performing the modification specified in Section III.13.2.8.3.3(a), any price-quantity pairs in a resource's substitution auction demand bid with a price greater than the Capacity Clearing Price for the resource's Capacity Zone or external interface will have its price reduced to the Capacity Clearing Price for the resource's Capacity Zone or external interface.

Except as provided in Section III.13.2.5.2.1(c), a rationable demand bid will be entered into the substitution auction on behalf of any Proxy De-List Bid associated with a Permanent De-List Bid or Retirement De-List Bid. The demand bid quantity will equal the portion of the Proxy De-List Bid that was not cleared (received a Capacity Supply Obligation) in the first run of the primary auction-clearing process. The demand bid will have priority to clear before non-rationable demand bids.

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III.13.2. Annual Forward Capacity Auction.

III.13.2.1. Timing of Annual Forward Capacity Auctions.

Each Forward Capacity Auction will be conducted beginning on the first Monday in the February that is approximately three years and four months before the beginning of the associated Capacity Commitment Period (unless, no later than the immediately preceding December 1, an alternative date is announced by the ISO), or, where exigent circumstances prevent the start of the Forward Capacity Auction at that time, as soon as possible thereafter.

III.13.2.2. Amount of Capacity Cleared in Each Forward Capacity Auction.

The total amount of capacity cleared in each Forward Capacity Auction shall be determined using the System-Wide Capacity Demand Curve and the Capacity Zone Demand Curves for the modeled Capacity Zones pursuant to Section III.13.2.3.3.

III.13.2.2.1. System-Wide Capacity Demand Curve.

The MRI Transition Period is the period from the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2020 through the earlier of:

(i) the Forward Capacity Auction for which the amount of the Installed Capacity Requirement (net of HQICCs) that is filed by the ISO with the Commission pursuant to Section III.12.3 for the upcoming Forward Capacity Auction is greater than or equal to the sum of: 34,151 MW, and: (a) 722 MW (for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2020); (b) 375 MW (for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2021), or; (c) 150 MW (for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2022);

(ii) the Forward Capacity Auction for which the product of the system-wide Marginal Reliability Impact value, calculated pursuant to Section III.12.1.1, and the scaling factor specified in Section III.13.2.2.4, specifies a quantity at $7.03/kW-month in excess of the MW value determined under the applicable subsection (2)(b), (2)(c), or (2)(d), below, or;

(iii) the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2022.

During the MRI Transition Period, the System-Wide Capacity Demand Curve shall consist of the following three segments:

(1) at prices above $7.03/kW-month and below the Forward Capacity Auction Starting Price, the System-Wide Capacity Demand Curve shall specify a price for system capacity quantities based on the product of the system-wide Marginal Reliability Impact value, calculated pursuant to Section III.12.1.1, and the scaling factor specified in Section III.13.2.2.4;

(2) at prices below $7.03/kW-month, the System-Wide Capacity Demand Curve shall be linear between $7.03/kW-month and $0.00/kW-month and determined by the following quantities:
   (a) At the price of $0.00/kW-month, the quantity specified by the System-Wide Capacity Demand Curve shall be 1616 MW plus the MW value determined under the applicable provision in (b), (c), or (d) of this subsection.
   (b) for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2020, at $7.03/kW-month, the quantity shall be the lesser of:
      1. 35,437 MW; and
      2. 722 MW plus the quantity at which the product of the system-wide Marginal Reliability Impact value and the scaling factor yield a price of $7.03/kW-month;
   (c) for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2021, at $7.03/kW-month, the quantity shall be the lesser of:
      1. 35,090 MW; and
      2. 375 MW plus the quantity at which the product of the system-wide Marginal Reliability Impact value and the scaling factor yield a price of $7.03/kW-month;
   (d) for the Forward Capacity Auction for the Capacity Commitment Period beginning June 1, 2022, at $7.03/kW-month, the quantity shall be the lesser of:
      1. 34,865 MW; and
      2. 150 MW plus the quantity at which the product of the system-wide Marginal Reliability Impact value and the scaling factor yield a price of $7.03/kW-month

(3) a price of $7.03/kW-month for all quantities between those curves segments.

In addition to the foregoing, the System-Wide Capacity Demand Curve shall not specify a price in excess of the Forward Capacity Auction Starting Price.

Following the MRI Transition Period, the System-Wide Capacity Demand Curve shall specify a price for system capacity quantities based on the product of the system-wide Marginal Reliability Impact value, calculated pursuant to Section III.12.1.1, and the scaling factor specified in Section III.13.2.2.4. For any system capacity quantity greater than 110% of the Installed Capacity Requirement (net of HQICCs), the System-Wide Capacity Demand Curve shall specify a price of zero. The System-Wide Capacity Demand Curve shall not specify a price in excess of the Forward Capacity Auction Starting Price.

III.13.2.2.2. Import-Constrained Capacity Zone Demand Curves.

For each import-constrained Capacity Zone, the Capacity Zone Demand Curve shall specify a price for all Capacity Zone quantities based on the product of the import-constrained Capacity Zone's Marginal Reliability Impact value, calculated pursuant to Section III.12.2.1.3, and the scaling factor specified in Section III.13.2.2.4. The prices specified by an import-constrained Capacity Zone Demand Curve shall be non-negative. At all quantities greater than the amount of capacity for which the Capacity Zone Demand Curve specifies a price of $0.01/kW-month, the Capacity Zone Demand Curve shall specify a price of zero. The Capacity Zone Demand Curve shall not specify a price in excess of the Forward Capacity Auction Starting Price.

III.13.2.2.3. Export-Constrained Capacity Zone Demand Curves.

For each export-constrained Capacity Zone, the Capacity Zone Demand Curve shall specify a price for all Capacity Zone quantities based on the product of the export-constrained Capacity Zone's Marginal Reliability Impact value, calculated pursuant to Section III.12.2.2.1, and the scaling factor specified in Section III.13.2.2.4. The prices specified by an export-constrained Capacity Zone Demand Curve shall be non-positive. At all quantities less than the amount of capacity for which the Capacity Zone Demand Curve specifies a price of negative $0.01/kW-month, the Capacity Zone Demand Curve shall specify a price of zero.

III.13.2.2.4. Capacity Demand Curve Scaling Factor.

The demand curve scaling factor shall be set at the value such that, at the quantity specified by the System-Wide Capacity Demand Curve at a price of Net CONE, the Loss of Load Expectation is 0.1 days per year.

III.13.2.3. Conduct of the Forward Capacity Auction.

The Forward Capacity Auction shall include a descending clock auction, which will determine, subject to the provisions of Section III.13.2.7, the Capacity Clearing Price for each Capacity Zone modeled in that Forward Capacity Auction pursuant to Section III.12.4, and the Capacity Clearing Price for certain offers from New Import Capacity Resources and Existing Import Capacity Resources pursuant to Section III.13.2.3.3(d). The Forward Capacity Auction shall determine the outcome of all offers and bids accepted during the qualification process and submitted during the auction. The descending clock auction shall be conducted as a series of rounds, which shall continue (for up to five consecutive Business Days, with up to eight rounds per day, absent extraordinary circumstances) until the Forward Capacity Auction is concluded for all modeled Capacity Zones in accordance with the provisions of Section III.13.2.3.3. Each round of the Forward Capacity Auction shall consist of the following steps, which shall be completed simultaneously for each Capacity Zone included in the round:

III.13.2.3.1. Step 1: Announcement of Start-of-Round Price and End-of-Round Price.

For each round, the auctioneer shall announce a single Start-of-Round Price (the highest price associated with a round of the Forward Capacity Auction) and a single (lower) End-of-Round Price (the lowest price associated with a round of the Forward Capacity Auction). In the first round, the Start-of-Round Price shall equal the Forward Capacity Auction Starting Price for all modeled Capacity Zones. In each round after the first round, the Start-of-Round Price shall equal the End-of-Round Price from the previous round.

III.13.2.3.2. Step 2: Compilation of Offers and Bids.

The auctioneer shall compile all of the offers and bids for that round, as follows:

(a) **Offers from New Generating Capacity Resources, New Import Capacity Resources, and New Demand Capacity Resources.**

(i) The Project Sponsor for any New Generating Capacity Resource, New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability, New Import Capacity

Resource that is associated with an Elective Transmission Upgrade, or New Demand Capacity Resource accepted in the qualification process for participation in the Forward Capacity Auction may submit a New Capacity Offer indicating the quantity of capacity that the Project Sponsor would commit to provide from the resource during the Capacity Commitment Period at that round's prices. A New Capacity Offer shall be defined by the submission of one to five prices, each strictly less than the Start-of-Round Price but greater than or equal to the End-of-Round Price, and an associated quantity in the applicable Capacity Zone. Each price shall be expressed in units of dollars per kilowatt-month to an accuracy of at most three digits to the right of the decimal point, and each quantity shall be expressed in units of MWs to an accuracy of at most three digits to the right of the decimal point. A New Capacity Offer shall imply a supply curve indicating quantities offered at all of that round's prices, pursuant to the convention of Section III.13.2.3.2(a)(iii).

(ii) If the Project Sponsor of a New Generating Capacity Resource, New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability, New Import Capacity Resource that is associated with an Elective Transmission Upgrade, or New Demand Capacity Resource elects to offer in a Forward Capacity Auction, the Project Sponsor must offer the resource's full FCA Qualified Capacity at the Forward Capacity Auction Starting Price in the first round of the auction. A New Capacity Offer for a resource may in no event be for greater capacity than the resource's full FCA Qualified Capacity at any price. A New Capacity Offer for a resource may not be for less capacity than the resource's Rationing Minimum Limit at any price, except where the New Capacity Offer is for a capacity quantity of zero.

(iii) Let the Start-of-Round Price and End-of-Round Price for a given round be P_S and P_E, respectively. Let the m prices ($1 \leq m \leq 5$) submitted by a Project Sponsor for a modeled Capacity Zone be $p_1, p_2, \ldots, p_m$, where $P_S > p_1 > p_2 > \ldots > p_m \geq P_E$, and let the associated quantities submitted for a New Capacity Resource be $q_1, q_2, \ldots, q_m$. Then the Project Sponsor's supply curve, for all prices strictly less than P_S but greater than or equal to P_E, shall be taken to be:

$$S(p) = \begin{cases} q_0, & \text{if } p > p_1, \\ q_1, & \text{if } p_2 < p \le p_1, \\ q_2, & \text{if } p_3 < p \le p_2, \\ \text{L} \quad \text{L} \quad , \\ q_m, & \text{if } p \le p_m. \end{cases}$$

where, in the first round, q_0 is the resource's full FCA Qualified Capacity and, in subsequent rounds, q_0 is the resource's quantity offered at the lowest price of the previous round.

(iv) Except for Renewable Technology Resources and except as provided in Section III.13.2.3.2(a)(v), a New Capacity Resource may not include any capacity in a New Capacity Offer during the Forward Capacity Auction at any price below the resource's New Resource Offer Floor Price. The amount of capacity included in each New Capacity Offer at each price shall be included in the aggregate supply curves at that price as described in Section III.13.2.3.3.

(v) Capacity associated with a New Import Capacity Resource (other than a New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability or a New Import Capacity Resource that is associated with an Elective Transmission Upgrade) shall be automatically included in the aggregate supply curves as described in Section III.13.2.3.3 at prices at or above the resource's offer prices (as they may be modified pursuant to Section III.A.21.2) and shall be automatically removed from the aggregate supply curves at prices below the resource's offer prices (as they may be modified pursuant to Section III.A.21.2), except under the following circumstances:

In any round of the Forward Capacity Auction in which prices are below the Dynamic De-List Bid Threshold, the Project Sponsor for a New Import Capacity Resource (other than a New Import Capacity Resource that is backed by a single new External Resource and that is associated with an investment in transmission that increases New England's import capability or a New Import Capacity Resource that is associated with an Elective Transmission Upgrade) with offer prices (as they may be modified pursuant to Section III.A.21.2) that are less than the Dynamic Delist Bid Threshold may submit a New Capacity Offer indicating the quantity of capacity that the Project Sponsor would commit to provide from the resource during the Capacity Commitment Period at that round's prices. Such an offer shall be defined by the submission of one to five

prices, each less than the Dynamic De-List Bid Threshold (or the Start-of-Round Price, if lower than the Dynamic De-List Bid Threshold) but greater than or equal to the End-of-Round Price, and a single quantity associated with each price. Such an offer shall be expressed in the same form as specified in Section III.13.2.3.2(a)(i) and shall imply a curve indicating quantities at all of that round's relevant prices, pursuant to the convention of Section III.13.2.3.2(a)(iii). The curve may not increase the quantity offered as the price decreases.

(b) **Bids from Existing Capacity Resources**

(i) Static De-List Bids, Permanent De-List Bids, Retirement De-List Bids, and Export Bids from Existing Generating Capacity Resources, Existing Import Capacity Resources, and Existing Demand Capacity Resources, as finalized in the qualification process or as otherwise directed by the Commission shall be automatically bid into the appropriate rounds of the Forward Capacity Auction, such that each such resource's FCA Qualified Capacity will be included in the aggregate supply curves as described in Section III.13.2.3.3 until any Static De-List Bid, Permanent De-List Bid, Retirement D-List Bid, or Export Bid clears in the Forward Capacity Auction, as described in Section III.13.2.5.2, and is removed from the aggregate supply curves. In the case of a Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid at or above the Forward Capacity Auction Starting Price, or where a Permanent De-List Bid or Retirement De-List Bid is subject to an election under Section III.13.1.2.4.1(a), the resource's FCA Qualified Capacity will be reduced by the quantity of the de-list bid (unless the resource was retained for reliability pursuant to Section III.13.1.2.3.1.5.1) and the Permanent De-List Bid or Retirement De-List Bid shall not be included in the Forward Capacity Auction. Permanent De-List Bids and Retirement De-List Bids subject to an election under Section III.13.1.2.4.1(a) or Section III.13.1.2.4.1(b) shall not be included in the Forward Capacity Auction and shall be treated according to Section III.13.2.3.2(b)(ii). In the case of a Static De-List Bid, if the Market Participant revised the bid pursuant to Section III.13.1.2.3.1.1, then the revised bid shall be used in place of the submitted bid; if the Market Participant withdrew the bid pursuant to Section III.13.1.2.3.1.1, then the capacity associated with the withdrawn bid shall be entered into the auction pursuant to Section III.13.2.3.2(c). If the amount of capacity associated with Export Bids for an interface exceeds the transfer limit of that interface (minus any accepted Administrative De-List Bids over that interface), then the set of Export Bids associated with that interface equal to the interface's transfer limit (minus any accepted Administrative De-List Bids over that interface) having the highest bid prices shall be included in the auction as described above;

capacity for which Export Bids are not included in the auction as a result of this provision shall be entered into the auction pursuant to Section III.13.2.3.2(c).

(ii) For Permanent De-List Bids and Retirement De-List Bids, the ISO will enter a Proxy De-List Bid into the appropriate rounds of the Forward Capacity Auction in the following circumstances: (1) if the Lead Market Participant has elected pursuant to Section III.13.1.2.4.1(a) to retire the resource or portion thereof, the resource has not been retained for reliability pursuant to Section III.13.1.2.3.1.5.1, the price specified in the Commission-approved de-list bid is less than the Forward Capacity Auction Starting Price, and the Internal Market Monitor has found a portfolio benefit pursuant to Section III.A.24; or (2) if the Lead Market Participant has elected conditional treatment pursuant to Section III.13.1.2.4.1(b), the resource has not been retained for reliability pursuant to Section III.13.1.2.3.1.5.1, and the price specified in the Commission-approved de-list bid is less than the price specified in the de-list bid submitted by the Lead Market Participant and less than the Forward Capacity Auction Starting Price. The Proxy De-List Bid shall be non-rationable and shall be equal in price and quantity to, and located in the same Capacity Zone as, the Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid, and shall be entered into the appropriate rounds of the Forward Capacity Auction such that the capacity associated with the Proxy De-List Bid will be included in the aggregate supply curves as described in Section III.13.2.3.3 until the Proxy De-List Bid clears in the Forward Capacity Auction, as described in Section III.13.2.5.2, and is removed from the aggregate supply curves. If the Lead Market Participant has elected conditional treatment pursuant to Section III.13.1.2.4.1(b), the resource has not been retained for reliability pursuant to Section III.13.1.2.3.1.5.1, and the Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid is equal to or greater than the de-list bid submitted by the Lead Market Participant, no Proxy De-List Bid shall be used and the Commission-approved de-list bid shall be entered in the Forward Capacity Auction pursuant to Section III.13.2.3.2(b)(i).

(iii) For purposes of this subsection (b), if an Internal Market Monitor-determined price has been established for a Static De-List Bid and the associated resource's capacity is pivotal pursuant to Sections III.A.23.1 and III.A.23.2, then (unless otherwise directed by the Commission) the lower of the Internal Market Monitor-determined price and any revised bid that is submitted pursuant to Section III.13.1.2.3.1.1 will be used in place of the initially submitted bid; provided, however, that if the bid was withdrawn pursuant to Section III.13.1.2.3.1.1, then the capacity associated with the withdrawn bid shall be entered into the auction pursuant to

Section III.13.2.3.2(c). If an Internal Market Monitor-determined price has been established for an Export Bid and the associated resource's capacity is pivotal pursuant to Sections III.A.23.1 and III.A.23.2, then the Internal Market Monitor-determined price (or price directed by the Commission) will be used in place of the submitted bid.

Any Static De-List Bid for ambient air conditions that has not been verified pursuant to Section III.13.1.2.3.2.4 shall not be subject to the provisions of this subsection (b).

(c) **Existing Capacity Resources Without De-List or Export Bids and Self-Supplied FCA Resources**. Each Existing Generating Capacity Resource, Existing Import Capacity Resource, and Existing Demand Capacity Resource without a Static De-List Bid, a Permanent De-List Bid, a Retirement De-List Bid, an Export Bid or an Administrative Export De-List Bid in its Existing Capacity Qualification Package, and each existing Self-Supplied FCA Resource shall be automatically entered into each round of the Forward Capacity Auction at its FCA Qualified Capacity, such that the resource's FCA Qualified Capacity will be included in the aggregate supply curves as described in Section III.13.2.3.3, except where such resource, if permitted, submits an appropriate Dynamic De-List Bid, as described in Section III.13.2.3.2(d). Each new Self-Supplied FCA Resource shall be automatically entered into each round of the Forward Capacity Auction at its designated self-supplied quantity at prices at or above the resource's New Resource Offer Floor Price, such that the resource's designated self-supply quantity will be included in the aggregate supply curves as described in Section III.13.2.3.3.

(d) **Dynamic De-List Bids.** In any round of the Forward Capacity Auction in which prices are below the Dynamic De-List Bid Threshold, any Existing Generating Capacity Resource, Existing Import Capacity Resource, or Existing Demand Capacity Resource (but not any Self-Supplied FCA Resources) may submit a Dynamic De-List Bid at prices below the Dynamic De-List Bid Threshold. Such a bid shall be defined by the submission of one to five prices, each less than the Dynamic De-List Bid Threshold (or the Start-of-Round Price, if lower than the Dynamic De-List Bid Threshold) but greater than or equal to the End-of-Round Price, and a single quantity associated with each price. Such a bid shall be expressed in the same form as specified in Section III.13.2.3.2(a)(i) and shall imply a curve indicating quantities at all of that round's relevant prices, pursuant to the convention of Section III.13.2.3.2(a)(iii). The curve may in no case increase the quantity offered as the price decreases. A dynamic De-List Bid may not offer less capacity than the resource's Rationing Minimum Limit at any price, except where the amount of capacity offered is zero. All Dynamic De-List Bids are subject to a reliability review as described in Section III.13.2.5.2.5, and if not rejected for reliability reasons, shall be included in the round in the same

manner as Static De-List Bids as described in Section III.13.2.3.2(b). Where a resource elected pursuant to Section III.13.1.1.2.2.4 or Section III.13.1.4.1.1.2.7 to have the Capacity Supply Obligation and Capacity Clearing Price continue to apply after the Capacity Commitment Period associated with the Forward Capacity Auction in which the offer clears, the capacity associated with any resulting Capacity Supply Obligation may not be subject to a Dynamic De-List Bid in subsequent Forward Capacity Auctions for Capacity Commitment Periods for which the Project Sponsor elected to have the Capacity Supply Obligation and Capacity Clearing Price continue to apply. Where a Lead Market Participant submits any combination of Dynamic De-List Bid, Static De-List Bid, Export Bid, and Administrative Export De-List Bid for a single resource, none of the prices in a set of price-quantity pairs associated with a bid may be the same as any price in any other set of price-quantity pairs associated with another bid for the same resource.

(e) **Repowering**. Offers and bids associated with a resource participating in the Forward Capacity Auction as a New Generating Capacity Resource pursuant to Section III.13.1.1.1.2 (resources previously counted as capacity resources) shall be addressed in the Forward Capacity Auction in accordance with the provisions of this Section III.13.2.3.2(e). The Project Sponsor shall offer such a New Generating Capacity Resource into the Forward Capacity Auction in the same manner and pursuant to the same rules as other New Generating Capacity Resources, as described in Section III.13.2.3.2(a). As long as any capacity is offered from the New Generating Capacity Resource, the amount of capacity offered is the amount that the auctioneer shall include in the aggregate supply curve at the relevant prices, and the quantity of capacity offered from the associated Existing Generating Capacity Resource shall not be included in the aggregate supply curve. If any portion of the New Generating Capacity Resource clears in the Forward Capacity Auction, the associated Existing Generating Capacity Resource shall be permanently de-listed as of the start of the associated Capacity Commitment Period. If at any price, no capacity is offered from the New Generating Capacity Resource, then the auctioneer shall include capacity from the associated Existing Generating Capacity Resource at that price, subject to any bids submitted and accepted in the qualification process for that Existing Generating Capacity Resource pursuant to Section III.13.1.2.5. Bids submitted and accepted in the qualification process for an Existing Generating Capacity Resource pursuant to Section III.13.1.2.5 shall only be entered into the Forward Capacity Auction after the associated New Generating Capacity Resource is fully withdrawn (that is, the Forward Capacity Auction reaches a price at which the resource's New Capacity Offer is zero capacity), and shall only then be subject to the reliability review described in Section III.13.2.5.2.5.

(f) **Conditional Qualified New Resources.** Offers associated with a resource participating in the Forward Capacity Auction as a Conditional Qualified New Resource pursuant to Section III.13.1.1.2.3(f) shall be addressed in the Forward Capacity Auction in accordance with the provisions of this Section III.13.2.3.2(f). The Project Sponsor shall offer such a Conditional Qualified New Resource into the Forward Capacity Auction in the same manner and pursuant to the same rules as other New Generating Capacity Resources, as described in Section III.13.2.3.2(a). An offer from at most one resource at a Conditional Qualified New Resource's location will be permitted to clear (receive a Capacity Supply Obligation for the associated Capacity Commitment Period) in the Forward Capacity Auction. As long as a positive quantity is offered at the End-of-Round Price in the final round of the Forward Capacity Auction by the resource having a higher queue priority at the Conditional Qualified New Resource's location, as described in Section III.13.1.1.2.3(f), then no capacity from the Conditional Qualified New Resource shall clear. If at any price greater than or equal to the End-of-Round Price in the final round of the Forward Capacity Auction, zero quantity is offered from the resource having higher queue priority at the Conditional Qualified New Resource's location, as described in Section III.13.1.1.2.3(f), then the auctioneer shall consider capacity offered from the Conditional Qualified New Resource in the determination of clearing, including the application of Section III.13.2.7.

(g) **Mechanics**. Offers and bids that may be submitted during a round of the Forward Capacity Auction must be received between the starting time and ending time of the round, as announced by the auctioneer in advance. The ISO at its sole discretion may authorize a participant in the auction to complete or correct its submission after the ending time of a round, but only if the participant can demonstrate to the ISO's satisfaction that the participant was making reasonable efforts to complete a valid offer submission before the ending time of the round, and only if the ISO determines that allowing the completion or correction will not unreasonably disrupt the auction process. All decisions by the ISO concerning whether or not a participant may complete or correct a submission after the ending time of a round are final.

III.13.2.3.3. Step 3: Determination of the Outcome of Each Round.

The auctioneer shall use the offers and bids for the round as described in Section III.13.2.3.2 to determine the aggregate supply curves for the New England Control Area and for each modeled Capacity Zone included in the round.

The aggregate supply curve for the New England Control Area, the Total System Capacity, shall reflect at each price the sum of the following:

(1) the amount of capacity offered in all Capacity Zones modeled as import-constrained Capacity Zones at that price (excluding capacity offered from New Import Capacity Resources and Existing Import Capacity Resources);

(2) the amount of capacity offered in the Rest-of-Pool Capacity Zone at that price (excluding capacity offered from New Import Capacity Resources and Existing Import Capacity Resources);

(3) for each Capacity Zone modeled as an export-constrained Capacity Zone, the lesser of:

  (i) the amount of capacity offered in the Capacity Zone at that price (including the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources for each interface between the New England Control Area and an external Control Area mapped to the export-constrained Capacity Zone up to that interface's approved capacity transfer limit (net of tie benefits), or;

  (ii) the amount of capacity determined by the Capacity Zone Demand Curve at zero minus that price, and;

(4) for each interface between the New England Control Area and an external Control Area mapped to an import-constrained Capacity Zone or the Rest-of-Pool Capacity Zone, the lesser of:

  (i) that interface's approved capacity transfer limit (net of tie benefits), or;

  (ii) the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources.

In computing the Total System Capacity, capacity associated with any New Capacity Offer at any price greater than the Forward Capacity Auction Starting Price will not be included in the tally of total capacity at the Forward Capacity Auction Starting Price for that Capacity Zone. On the basis of these aggregate supply curves, the auctioneer shall determine the outcome of the round for each modeled Capacity Zone as follows:

(a) **Import-Constrained Capacity Zones.**

For a Capacity Zone modeled as an import-constrained Capacity Zone, if either of the following two conditions is met during the round:

(1) the aggregate supply curve for the import-constrained Capacity Zone, adjusted as necessary in accordance with Section III.13.2.6 (Capacity Rationing Rule), equals or is less than the quantity determined by the Capacity Zone Demand Curve at the difference between the End-of-Round Price and the price specified by the System-Wide Capacity Demand Curve (at a quantity no less than Total System Capacity at the Start-of-Round Price), or;

(2) the Forward Capacity Auction is concluded for the Rest-of-Pool Capacity Zone;

then the Forward Capacity Auction for that Capacity Zone is concluded and such Capacity Zone will not be included in further rounds of the Forward Capacity Auction.

The Capacity Clearing Price for that Capacity Zone shall be set at the greater of: (1) the sum of the price specified by the Capacity Zone Demand Curve at the amount of capacity equal to the total amount that is awarded a Capacity Supply Obligation in the import-constrained Capacity Zone, and the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, or; (2) the highest price of any offer or bid for a resource in the Capacity Zone that is awarded a Capacity Supply Obligation, subject to the other provisions of this Section III.13.2.

If neither of the two conditions above are met in the round, then the auctioneer shall publish the quantity of capacity in the Capacity Zone from Demand Capacity Resources by type at the End-of-Round Price, and that Capacity Zone will be included in the next round of the Forward Capacity Auction.

(b) **Rest-of-Pool Capacity Zone**.

If the Total System Capacity at the End-of-Round Price, adjusted as necessary in accordance with Section III.13.2.6 (Capacity Rationing Rule), and adjusted to include the additional supply in the import-constrained Capacity Zone that may be cleared at a higher price, equals or is less than the amount of capacity determined by the System-Wide Capacity Demand Curve, then the Forward Capacity Auction for the Rest-of-Pool Capacity Zone is concluded and the Rest-of-Pool Capacity Zone will not be included in further rounds of the Forward Capacity Auction.

The Capacity Clearing Price for the Rest-of-Pool Capacity Zone shall be set at the highest price at which the Total System Capacity is less than or equal to the amount of capacity determined by the System-Wide Capacity Demand Curve, subject to the other provisions of this Section III.13.2.

If the Forward Capacity Auction for the Rest-of-Pool Capacity Zone is not concluded then the Rest-of-Pool Capacity Zone will be included in the next round of the Forward Capacity Auction, and the auctioneer shall publish the Total System Capacity at the End-of-Round Price, adjusted to include the additional supply in the import-constrained Capacity Zone that may be cleared at a higher price, less the amount of capacity determined by the System-Wide Capacity Demand Curve at the End-of-Round Price, and also shall publish the quantity of capacity from Demand Capacity Resources by type at the End-of-Round Price.

(c) **Export-Constrained Capacity Zones**. For a Capacity Zone modeled as an export-constrained Capacity Zone, if both of the following two conditions are met during the round:

(1) the aggregate supply curve for the export-constrained Capacity Zone, adjusted as necessary in accordance with Section III.13.2.6 (Capacity Rationing Rule), is equal to or less than the maximum amount of capacity determined by the Capacity Zone Demand Curve at a price of zero, and;

(2) the Forward Capacity Auction is concluded for the Rest-of-Pool Capacity Zone;

then the Forward Capacity Auction for that Capacity Zone is concluded and such Capacity Zone will not be included in further rounds of the Forward Capacity Auction.

The Capacity Clearing Price for that Capacity Zone shall be set at the greater of: (1) the sum of the price specified by the Capacity Zone Demand Curve at the amount of capacity equal to the total amount that is awarded a Capacity Supply Obligation in the export-constrained Capacity Zone, and the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, or; (2) the highest price of any offer or bid for a resource in the Capacity Zone that is awarded a Capacity Supply Obligation, and subject to the other provisions of this Section III.13.2.

If it is not the case that both of the two conditions above are satisfied in the round, then the auctioneer shall publish the quantity of excess supply in the export-constrained Capacity Zone at the End-of-Round Price (the amount of capacity offered at the End-of-Round Price in the export-

constrained Capacity Zone minus the maximum amount of capacity determined by the Capacity Zone Demand Curve at a price of zero) and the quantity of capacity in the Capacity Zone from Demand Capacity Resources by type at the End-of-Round Price, and that Capacity Zone will be included in the next round of the Forward Capacity Auction.

(d) **Treatment of Import Capacity.** Where the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over an interface between the New England Control Area and an external Control Area is less than or equal to that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the capacity offers from those resources shall be treated as capacity offers in the modeled Capacity Zone associated with that interface. Where the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over an interface between the New England Control Area and an external Control Area is greater than that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the following provisions shall apply (separately for each such interface):

(i) For purposes of determining which capacity offers from the New Import Capacity Resources and Existing Import Capacity Resources over the interface shall clear and at what price, the offers over the interface shall be treated in the descending-clock auction as if they comprised a separately-modeled export-constrained capacity zone, with an aggregate supply curve consisting of the offers from the New Import Capacity Resources and Existing Import Capacity Resources over the interface.

(ii) The amount of capacity offered over the interface that will be included in the aggregate supply curve of the modeled Capacity Zone associated with the interface shall be the lesser of the following two quantities: the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over the interface; and the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF).

(iii) The Forward Capacity Auction for New Import Capacity Resources and Existing Import Capacity Resources over the interface is concluded when the following two conditions are both satisfied: the amount of capacity offered from New Import Capacity Resource and Existing Import Capacity Resources over the interface is less than or equal to the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-

TF); and the Forward Capacity Auction is concluded in the modeled Capacity Zone associated with the interface.

(e) **Treatment of Export Capacity.** Any Export Bid or any Administrative Export De-List Bid that is used to export capacity through an export interface connected to an import-constrained Capacity Zone from another Capacity Zone, or through an export interface connected to the Rest-of-Pool Capacity Zone from an export-constrained Capacity Zone in the Forward Capacity Auction will be modeled in the Capacity Zone where the export interface that is identified in the Existing Capacity Qualification Package is located. The Export Bid or Administrative Export De-List Bid clears in the Capacity Zone where the Export Bid or Administrative Export De-List Bid is modeled.

(i) Then the MW quantity equal to the relevant Export Bid or Administrative Export De-List Bid from the resource associated with the Export Bid or Administrative Export De-List Bid will be de-listed in the Capacity Zone where the resource is located. If the export interface is connected to an import-constrained Capacity Zone, the MW quantity procured will be in addition to the amount of capacity determined by the Capacity Zone Demand Curve for the import-constrained Capacity Zone.

(ii) If the Export Bid or Administrative Export De-List Bid does not clear, then the resource associated with the Export Bid or Administrative Export De-List Bid will not be de-listed in the Capacity Zone where the resource is located.

III.13.2.3.4. Determination of Final Capacity Zones.

(a) For all Forward Capacity Auctions up to and including the sixth Forward Capacity Auction (for the Capacity Commitment Period beginning June 1, 2015), after the Forward Capacity Auction is concluded for all modeled Capacity Zones, the final set of distinct Capacity Zones that will be used for all purposes associated with the relevant Capacity Commitment Period, including for the purposes of reconfiguration auctions and Capacity Supply Obligation Bilaterals, shall be those having distinct Capacity Clearing Prices as a result of constraints between modeled Capacity Zones binding in the running of the Forward Capacity Auction. Where a modeled constraint does not bind in the Forward Capacity Auction, and as a result adjacent modeled Capacity Zones clear at the same Capacity Clearing Price, those modeled Capacity Zones shall be a single Capacity Zone used for all purposes of the relevant Capacity Commitment Period, including for the purposes of reconfiguration auctions and Capacity Supply Obligation Bilaterals.

(b) For all Forward Capacity Auctions beginning with the seventh Forward Capacity Auction (for the Capacity Commitment Period beginning June 1, 2016) the final set of distinct Capacity Zones that will be used for all purposes associated with the relevant Capacity Commitment Period, including for the purposes of reconfiguration auctions and Capacity Supply Obligation Bilaterals, shall be those described in Section III.12.4.

III.13.2.4. Forward Capacity Auction Starting Price and the Cost of New Entry.

The Forward Capacity Auction Starting Price is max [1.6 multiplied by Net CONE, CONE]. References in this Section III.13 to the Forward Capacity Auction Starting Price shall mean the Forward Capacity Auction Starting Price for the Forward Capacity Auction associated with the relevant Capacity Commitment Period.

CONE for the Forward Capacity Auction for the Capacity Commitment Period beginning on June 1, 2021 is $11.35/kW-month.

Net CONE for the Forward Capacity Auction for the Capacity Commitment Period beginning on June 1, 2021 is $8.04/kW-month.

CONE and Net CONE shall be recalculated using updated data coincident with the recalculation of Offer Review Trigger Prices pursuant to Section III.A.21.1.2. Whenever these values are recalculated, the ISO will review the results of the recalculation with stakeholders and the new values will be filed with the Commission prior to the Forward Capacity Auction in which the new value is to apply.

Between recalculations, CONE and Net CONE will be adjusted for each Forward Capacity Auction pursuant to Section III.A.21.1.2(e). Prior to applying the annual adjustment for the Capacity Commitment Period beginning on June 1, 2019, Net CONE will be reduced by $0.43/kW-month to reflect the elimination of the PER adjustment. The adjusted CONE and Net CONE values will be published on the ISO's web site.

III.13.2.5. Treatment of Specific Offer and Bid Types in the Forward Capacity Auction.

III.13.2.5.1. Offers from New Generating Capacity Resources, New Import Capacity Resources, and New Demand Capacity Resources.

A New Capacity Offer (other than one from a Conditional Qualified New Resource) clears (receives a Capacity Supply Obligation for the associated Capacity Commitment Period) in the Forward Capacity Auction if the Capacity Clearing Price is greater than or equal to the price specified in the offer, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6. An offer from a Conditional Qualified New Resource clears (receives a Capacity Supply Obligation for the associated Capacity Commitment Period) in the Forward Capacity Auction, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6, if all of the following conditions are met: (i) the Capacity Clearing Price is greater than or equal to the price specified in the offer; (ii) capacity from that resource is considered in the determination of clearing as described in Section III.13.2.3.2(f); and (iii) such offer minimizes the costs for the associated Capacity Commitment Period, subject to Section III.13.2.7.7(c).

The amount of capacity that receives a Capacity Supply Obligation through the Forward Capacity Auction shall not exceed the quantity of capacity offered from the New Generating Capacity Resource, New Import Capacity Resource, or New Demand Capacity Resource at the Capacity Clearing Price.

III.13.2.5.2. Bids and Offers from Existing Generating Capacity Resources, Existing Import Capacity Resources, and Existing Demand Capacity Resources.

III.13.2.5.2.1. Permanent De-List Bids and Retirement De-List Bids.

(a) Except as provided in Section III.13.2.5.2.5, a Permanent De-List Bid, Retirement De-List Bid or Proxy De-List Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation) if the Capacity Clearing Price is less than or equal to the price specified in the bid, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6.

(b) Unless the capacity has been retained for reliability pursuant to Section III.13.2.5.2.5, if all or part of a resource with a Permanent De-List Bid or Retirement De-List Bid does not clear in the Forward Capacity Auction (receives a Capacity Supply Obligation), the Lead Market Participant shall enter the uncleared portion of the bid into the qualification process for the following Forward Capacity Auction as described in Section III.13.1.2.3.1.5.

(c) If the Capacity Clearing Price is greater than the price specified in a de-list bid submitted by a Lead Market Participant that elected conditional treatment for the de-list bid pursuant to Section III.13.1.2.4.1(b), and there is an associated Proxy De-List Bid that does not clear (receives a Capacity Supply Obligation), the resource will receive a Capacity Supply Obligation at the Capacity Clearing Price.

(d) The process by which the primary auction is cleared (but not the compilation of offers and bids pursuant to Sections III.13.2.3.1 and III.13.2.3.2) will be repeated after the substitution auction is completed if one of the following conditions is met: (1) if any Proxy De-List Bid entered as a result of a Lead Market Participant electing to retire pursuant to Section III.13.1.2.4.1(a) does not clear (receives a Capacity Supply Obligation) in the first run of the primary auction-clearing process and retains some portion of its Capacity Supply Obligation in the substitution auction; or (2) if any Proxy De-List Bid entered as a result of a Lead Market Participant electing conditional treatment pursuant to Section III.13.1.2.4.1(b) does not clear (receives a Capacity Supply Obligation) in the first run of the primary auction-clearing process, the de-list bid submitted by the Lead Market Participant is at or above the Capacity Clearing Price, and the Proxy De-List Bid retains some portion of its Capacity Supply Obligation in the substitution auction. The second run of the primary auction-clearing process: (i) excludes all Proxy De-List Bids, (ii) includes the offers and bids of resources compiled pursuant to Section III.13.2.3.2 that did not receive a Capacity Supply Obligation in the first run of the primary auction-clearing process but excluding the offers and bids, or portion thereof, associated with resources that acquired or shed a Capacity Supply Obligation in the substitution auction, and (iii) includes the capacity of resources, or portion thereof, that retain a Capacity Supply Obligation after the first run of the primary auction-clearing process and the substitution auction. The second run of the primary auction-clearing process shall not affect the Capacity Clearing Price of the Forward Capacity Auction (which is established by the first run of the primary auction-clearing process).

(e) Resources (other than those still subject to a multi-year Capacity Commitment Period election as described in Sections III.13.1.1.2.2.4 and III.13.1.4.1.1.2.7) that receive a Capacity Supply Obligation as a result of the first run of the primary auction-clearing process shall be paid the Capacity Clearing Price during the associated Capacity Commitment Period. Where the second run of the primary auction-clearing process procures additional capacity, the resulting price, paid during the associated Capacity Commitment Period (and subsequent Capacity Commitment Periods, as elected pursuant to Section III.13.1.1.2.2.4 or Section III.13.1.4.1.1.2.7) to the additionally procured capacity, shall be equal to or

greater than the adjusted price resulting from the first run of the primary auction-clearing process for that Capacity Zone.

III.13.2.5.2.2. Static De-List Bids and Export Bids.

Except as provided in Section III.13.2.5.2.5, a Static De-List Bid or an Export Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation for the associated Capacity Commitment Period) if the Capacity Clearing Price is less than or equal to the price specified in the bid, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6.

III.13.2.5.2.3. Dynamic De-List Bids.

A Dynamic De-List Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation for the associated Capacity Commitment Period) if the Capacity Clearing Price is less than or equal to the price specified in the bid, except possibly as a result of the Capacity Rationing Rule described in Section III.13.2.6. If more Dynamic De-List Bids are submitted at a price than are needed to clear the market, such Dynamic De-List Bids shall be cleared pro-rata, but in no case less than a resource's Rationing Minimum Limit.

III.13.2.5.2.4. Administrative Export De-List Bids.

An Administrative Export De-List Bid clears in the Forward Capacity Auction (does not receive a Capacity Supply Obligation for the associated Capacity Commitment Period) regardless of the Capacity Clearing Price.

III.13.2.5.2.5. Reliability Review.

The ISO shall review each Retirement De-List Bid, Permanent De-List Bid, Static De-List Bid, Export Bid, Administrative Export De-List Bid, Dynamic De-List Bid, and substitution auction demand bid to determine whether the capacity associated with that bid is needed for reliability reasons during the Capacity Commitment Period associated with the Forward Capacity Auction; Proxy De-List Bids shall not be reviewed.

(a) The reliability review will be conducted in descending price order using the price as finalized during qualification or as otherwise directed by the Commission. Bids with the same price will be reviewed in the order that produces the least negative impact to reliability; where bids are the same price and provide the same impact to reliability, they will be reviewed based on their submission time. If bids with the same price are from a single generating station, they will be reviewed in an order that seeks to

provide (1) the least-cost solution under Section III.13.2.5.2.5.1(d) and (2) the minimum aggregate quantity required for reliability from the generating station. The capacity shall be deemed needed for reliability reasons if the absence of the capacity would result in the violation of any NERC or NPCC criteria, or ISO New England System Rules. Bids shall only be rejected pursuant to this Section III.13.2.5.2.5 for the sole purpose of addressing a local reliability issue, and shall not be rejected solely on the basis that acceptance of the bid may result in the procurement of less capacity than the Installed Capacity Requirement (net of HQICCs) or the Local Sourcing Requirement for a Capacity Zone.

(b) If a Retirement De-List Bid, Permanent De-List Bid, Static De-List Bid, Export Bid, Administrative Export De-List Bid, or Dynamic De-List Bid would otherwise clear in the Forward Capacity Auction, but the ISO has determined that some or all of the capacity associated with the de-list bid is needed for reliability reasons, then the de-list bid having capacity needed for reliability will not clear in the Forward Capacity Auction. If the ISO has determined that some or all of the capacity associated with a demand bid is needed for reliability reasons, then the entire demand bid will not be included in the substitution auction.

(c) The Lead Market Participant shall be notified that its bid did not clear for reliability reasons at the later of: (i) immediately after the end of the Forward Capacity Auction round in which the auction price reaches the price of the de-list bid; or (ii) as soon as practicable after the time at which the ISO has determined that the bid must be rejected for reliability reasons. In no event, however, shall a Lead Market Participant be notified that a bid submitted pursuant to Section III.13.1.2.5 and accepted in the qualification process for an Existing Generating Capacity Resource did not clear for reliability reasons if the associated New Generating Capacity Resource remains in the Forward Capacity Auction. In such a case, the Lead Market Participant shall be notified that its bid did not clear for reliability reasons at the later of: (i) immediately after the end of the Forward Capacity Auction round in which the auction price reaches the price of the bid; (ii) immediately after the end of the Forward Capacity Auction round in which the associated New Generating Capacity Resource is fully withdrawn (that is, the Forward Capacity Auction reaches a price at which the resource's New Capacity Offer is zero capacity); or (iii) as soon as practicable after the time at which the ISO has determined that the bid must be rejected for reliability reasons.

(d) A resource that has a de-list bid rejected for reliability reasons shall be compensated pursuant to the terms set out in Section III.13.2.5.2.5.1 and shall have a Capacity Supply Obligation as described in Section III.13.6.1.

(e) The ISO shall review the results of each annual reconfiguration auction and determine whether the reliability need which caused the ISO to reject the de-list bid has been met through the annual reconfiguration auction. The ISO may also attempt to address the reliability concern through other reasonable means (including transmission enhancements).

(f) If the reliability need that caused the ISO to reject a de-list bid is met through a reconfiguration auction or other means, the resource shall retain its Capacity Supply Obligation through the end of the Capacity Commitment Period for which it was retained for reliability (provided that resources that have Permanent De-List Bids or Retirement De-List Bids rejected for reliability shall be permanently de-listed or retired as of the first day of the subsequent Capacity Commitment Period (or earlier if the resource sheds the entirety of the Capacity Supply Obligation as described in Section III.13.2.5.2.5.3(a)(ii) or Section III.13.2.5.2.5.3(b)(ii))).

(g) If a Permanent De-List Bid or a Retirement De-List Bid is rejected for reliability reasons, and the reliability need is not met through a reconfiguration auction or other means, that resource, or portion thereof, as applicable, is no longer eligible to participate as an Existing Capacity Resource in any reconfiguration auction, Forward Capacity Auction or Capacity Supply Obligation Bilateral for that and subsequent Capacity Commitment Periods. If the resource, or portion thereof, continues to be needed for reliability reasons, it shall be counted as capacity in the Forward Capacity Auction and shall be compensated as described in Section III.13.2.5.2.5.1.

(h) The ISO shall review with the Reliability Committee (i) the status of any prior rejected de-list bids reported to the Commission in an FCA results filing pursuant to Section 13.8.2, and (ii) the status of any Retirement De-List Bid or Permanent De-List Bid that has been rejected for reliability reasons and has elected to continue to operate, prior to the New Capacity Qualification Deadline in accordance with Section 4.1(c) of Attachment K of the ISO OATT.

If an identified reliability need results in the rejection of a Retirement De-List Bid, Permanent De-List Bid, Export Bid, Administrative Export De-List Bid, Static De-List Bid, or Dynamic De-List Bid while executing an FCA, the ISO shall (i) review each specific reliability need with the Reliability Committee in accordance with the timing provided for in the ISO New England Operating Documents and, (ii) update the current system Needs Assessments pursuant to Section 4.1(c) of Attachment K of the

ISO OATT. This review and update will follow ISO's filing of the FCA results with the Commission pursuant to Section 13.8.2.

III.13.2.5.2.5A Fuel Security Reliability Review

(a) This Section III.13.2.5.2.5A will remain in effect for the 2022/23, 2023/24 and 2024/25 Capacity Commitment Period, after which this Section III.13.2.5.2.5A will sunset.

(b) This Section III.13.2.5.2.5A will apply to (i) Retirement De-List Bids, (ii) substitution auction demand bids, and (iii) bilateral transactions and reconfiguration auctions demand bids submitted by an Existing Generating Capacity Resource that has been identified as being needed for fuel security during a Forward Capacity Auction. Terms set out in this Section III.13.2.5.2.5A will apply only for the period and resources described within this Section III.13.2.5.2.5A. Where the terms and conditions in this Section III.13.2.5.2.5A differ from terms otherwise set out in Section III.13, the terms of this Section III.13.2.5.2.5A will control for the period and circumstances described in Section III.13.2.5.2.5A.

(c) A fuel security reliability review for the Forward Capacity Market will be performed pursuant to Appendix L to Section III of the Tariff, and in accordance with the inputs and methodology set out to establish the fuel security reliability standard in Appendix I of Planning Procedure No. 10.

(d) For fuel security reliability reviews performed for the primary Forward Capacity Auction, the fuel security reliability review will be performed after the Existing Capacity Retirement Deadline and conducted in descending price order using the price as submitted in the Retirement De-List Bids. Bids with the same price will be reviewed in the order that produces the least negative impact to reliability. Where multiple bids have the same price and the retirement of the Existing Generating Capacity Resources would have the same impact to reliability, they will be reviewed based on their submission time. If bids with the same price are from a single generating station, they will be reviewed in an order that seeks to provide (1) the least-cost solution under Section III.13.2.5.2.5.1(d), and (2) the minimum aggregate quantity required for reliability from the generating station. An Existing Generating Capacity Resource may be needed for both fuel security and for transmission security pursuant to Section III.13.2.5.2.5. The fuel security reliability review will be performed in advance of the reliability review for transmission security. Where an Existing Generating Capacity Resource is needed for both fuel security reasons pursuant to this Section III.13.2.5.2.5A, and transmission security reliability reasons

pursuant to Section III.13.2.5.2.5, the generator will be retained for fuel security for purposes of cost allocation.

(e) If an Existing Generating Capacity Resource is identified as being needed for fuel security reasons, and the reliability need is not met through a reconfiguration auction or other means, that resource, or portion thereof, as applicable may not participate in Annual Reconfiguration Auctions for the Capacity Commitment Period(s) for which it is needed for fuel security, or earlier 2022/23, 2023/24 and 2024/25 Capacity Commitment Periods. Such an Existing Generating Capacity Resource that is identified as being needed for fuel security may participate in monthly bilateral transactions and monthly reconfiguration auctions, but may not submit monthly bilateral transactions for December, January or February, or demand bids for the December, January, or February monthly reconfiguration auctions for any period for which they have been identified as being needed for fuel security.

(f) Participants that have submitted a Retirement De-List Bid will be notified by ISO New England if their resource is needed for fuel security reliability reasons no later than 90 days after the Existing Capacity Retirement Deadline. Participants that have submitted a substitution auction demand bid, and where the demand bid has been rejected for reliability reasons, will be notified after the relevant Forward Capacity Auction has been completed.

(g) Where a Retirement De-List Bid would otherwise clear in the Forward Capacity Auction, but the ISO has determined that some or all of the capacity associated with the de-list bid is needed for fuel security reliability reasons, the provisions of III.13.2.5.2.5(b) shall apply.

(h) Existing Generating Capacity Resources that have had their Retirement De-list Bid rejected for fuel security reliability reasons and that do not elect to unconditionally or conditionally retire shall be eligible for compensation pursuant to Section III.13.2.5.2.5.1, except that the difference between payments based on resource de-list bids or cost-of-service compensation as detailed in Section III.13.2.5.2.5.1 and payments based on the Capacity Clearing Price for the Forward Capacity Market under this Section III.13.2.5.2.5.1 shall be allocated on a regional basis to Real Time Load Obligation, excluding Real-Time Load Obligation associated with Dispatchable Asset Related Demand Resources (DARD Pumps and other electric storage based DARDs) and Real-Time Load Obligation associated with Coordinated External Transactions, allocated and collected over a 12 month period. Resources that that are identified as needed for fuel security reliability reasons will have their capacity entered into the Forward Capacity Auction pursuant to III.13.2.5.2.5(g) and III.13.2.3.2(b).

(i) Where an Existing Generating Capacity Resource elects a cost-of-service agreement pursuant to Section III.13.2.5.2.5.1 to address a fuel security reliability need, the term of such a cost-of-service agreement may not exceed two years, including renewal through evergreen provisions. A cost-of-service agreement entered into for the 2024/2025 Capacity Commitment Period shall be limited to a total duration of one year.

(j) The ISO shall perform an annual reevaluation of any Existing Generating Capacity Resources retained for reliability under this provision. If a resource associated with a Retirement De-List Bid that was rejected for reliability reasons pursuant to this section, is found to no longer be needed for fuel security, and is not needed for another reliability reason pursuant to Section III.13.2.5.2.5, the resource will be retired from the system as described in Section III.13.2.5.2.5.3(a)(1). In no case will a resource retained for fuel security be retained for fuel security beyond June 1, 2025.

(k) The ISO will review Retirement De-List Bids rejected for fuel security reliability reasons with the Reliability Committee in the same manner as described in Section III.13.2.5.2.5(h).

III.13.2.5.2.5.1. Compensation for Bids Rejected for Reliability Reasons.

(a) In cases where a Static De-List Bid, Export Bid, Administrative Export De-List Bid, Dynamic De-List Bid, partial Permanent De-List Bid, or partial Retirement De-List Bid has been rejected for reliability reasons pursuant to Sections III.13.1.2.3.1.5.1 or III.13.2.5.2.5, the resource will be paid by the ISO in the same manner as all other capacity resources, except that payment shall be made on the basis of its de-list bid as accepted for the Forward Capacity Auction for the relevant Capacity Commitment Period instead of the Forward Capacity Market Clearing Price. Under this Section, accepted Dynamic De-List Bids filed with the Commission as part of the FCA results filing are subject to review and approval by the Commission pursuant to the "just and reasonable" standard of Section 205 of the Federal Power Act. If a resource with a partial Permanent De-List Bid or partial Retirement De-List Bid continues to be needed for reliability in Capacity Commitment Periods following the Capacity Commitment Period for which the partial Permanent De-List Bid or partial Retirement De-List Bid was rejected, payment will continue to be pursuant to this Section III.13.2.5.2.5.1(a).

(b) In cases where a Permanent De-List Bid or a Retirement De-List Bid for the capacity of an entire resource has been rejected for reliability reasons pursuant to Section III.13.1.2.3.1.5.1 or III.13.2.5.2.5, the resource will be paid either (i) in the same manner as all other capacity resources, except that payment

shall be made on the basis of its Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid for the relevant Capacity Commitment Period instead of the Forward Capacity Market Clearing Price or (ii) under the terms of a cost-of-service agreement pursuant to Section III, Appendix I. Resources must notify the ISO of their election within six months after the ISO files the results of the relevant Forward Capacity Auction with the Commission. A resource that has had a Permanent De-List Bid or Retirement De-List Bid rejected for reliability reasons and does not notify the ISO of its election as described in this paragraph will be paid on the basis of the resource's Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid. Cost-of-service agreements must be filed with and approved by the Commission, and cost-of-service compensation may not commence until the Commission has approved the use of cost-of-service rates for the unit in question or has accepted the use of the cost-of-service rates subject to refund while the rate is reviewed. In no event will payment under the cost-of-service agreement start prior to the start of the relevant Capacity Commitment Period for which the Permanent De-List Bid or Retirement De-List Bid was submitted. If a resource continues to be needed for reliability in Capacity Commitment Periods following the Capacity Commitment Period for which the Permanent De-List Bid or Retirement De-List Bid was rejected, payment will continue to be pursuant to this Section III.13.2.5.2.5.1(b). Resources that elect payment based on the Commission-approved Permanent De-List Bid or Commission-approved Retirement De-List Bid may file with the Commission pursuant to Section 205 of the Federal Power Act to update its Permanent De-List Bid or Retirement De-List Bid if the unit is retained for reliability for a period longer than the Capacity Commitment Period for which the Permanent De-List Bid or Retirement De-List Bid was originally submitted.

(c) The difference between payments based on resource de-list bids or cost-of-service compensation as detailed in this Section III.13.2.5.2.5.1 and payments based on the market clearing price for the Forward Capacity Market under this Section III.13.2.5.2.5.1 shall be allocated to Regional Network Load within the affected Reliability Region.

(d) **Compensation for Existing Generating Capacity Resources at Stations with Common Costs that are Retained for Reliability**. If a Static De-List Bid, Permanent De-List Bid, or Retirement De-List Bid from an Existing Generating Capacity Resource that is associated with a Station having Common Costs is rejected for reliability reasons, the Existing Generating Capacity Resource will be paid as follows: (i) if one or more Existing Generating Capacity Resources at the Station assume a Capacity Supply Obligation through the normal clearing of the Forward Capacity Auction and one or more Existing Generating Capacity Resources are retained for reliability, then the Existing Generating Capacity

Resources retained for reliability will be paid the sum of the Asset-Specific Going Forward Costs for the assets comprising that Existing Generating Capacity Resource; or (ii) if no Existing Generating Capacity Resources at the Station assumes a Capacity Supply Obligation through the normal clearing of the Forward Capacity Auction and one or more Existing Generating Capacity Resources are retained for reliability, then each Existing Generating Capacity Resource retained for reliability will be paid the sum of the Asset-Specific Going Forward Costs for the assets associated with that Existing Generating Capacity Resource plus a portion of the Station Going Forward Common Costs (such that the full amount of Station Going Forward Common Costs are allocated to the Existing Generating Capacity Resources retained for reliability).

(e) If ISO-NE is a party to a cost-of-service agreement filed after January 1, 2019 that changes any resource performance-related obligations contained in Section III, Appendix I (provided that those obligations are different than the obligations of an Existing Generating Capacity Resource with a Capacity Supply Obligation), no later than 30 days after such agreement is filed with the Commission, ISO-NE shall provide to stakeholders quantitative and qualitative information on the need for, and the impacts of, the proposed changes.

III.13.2.5.2.5.2. Incremental Cost of Reliability Service From Permanent De-List Bid or Retirement De-List Bid Resources.

In cases where an Existing Generating Capacity Resource or Existing Demand Capacity Resource has had a Permanent De-List Bid or Retirement De-List Bid for the entire resource rejected for reliability reasons pursuant to Sections III.13.1.2.3.1.5.1 or III.13.2.5.2.5, does not elect to retire pursuant to Section III.13.1.2.3.1.5.1(d), and must make a capital improvement to the unit to remain in operation in order to continue to operate to meet the reliability need identified by the ISO, the resource may make application to the Commission pursuant to Section 205 of the Federal Power Act to receive just and reasonable compensation of the capital investment pursuant to the following:

(a) **Notice to State Utility Commissions, the ISO and Stakeholder Committees of Expectation that a Capital Expense will be Necessary to Meet the Reliability Need Identified by the ISO**: A resource seeking to avail itself of the recovery mechanism provided in this Section must notify the state utility commissions in the states where rate payers will fund the capital improvement, the ISO, and the Participants Committee of its intent to make the capital expenditure and the need for the expenditure. This notification must be made at least 120 days prior to the resource making the capital expenditure.

(b) **Required Showing Made to the Federal Energy Regulatory Commission**: In order to receive just and reasonable compensation for a capital expenditure under this Section, a resource must file an explanation of need with the Commission that explains why the capital expenditure is necessary in order to meet the reliability need identified by the ISO. This showing must demonstrate that the expenditure is reasonably determined to be the least-cost commercially reasonable option consistent with Good Utility Practice to meet the reliability need identified by the ISO. If the resource elects cost-of-service treatment pursuant to Section III.13.2.5.2.5.1(b), the Incremental Cost of Reliability Service filing described in this Section must be made separately from and may be made in advance of the resource's cost-of-service filing.

(c) **Allocation:** Costs of capital expenditures approved by the Commission under this provision shall be allocated to Regional Network Load within the affected Reliability Region.

III.13.2.5.2.5.3. Retirement and Permanent De-Listing of Resources.

(a)(i) A resource, or portion thereof, will be retired coincident with the commencement of the relevant Capacity Commitment Period, or earlier as described in Section III.13.2.5.2.5.3(a)(ii), if the resource: (1) submitted a Retirement De-List Bid at or above the Forward Capacity Auction Starting Price and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; (2) submitted a Permanent De-List Bid or Retirement De-List Bid, elected to retire pursuant to Section III.13.1.2.4.1(a), and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; (3) elected conditional treatment pursuant to Section III.13.1.2.4.1(b) for a Retirement De-List Bid with a submitted price at or above the Capacity Clearing Price and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; or (4) had a Commission-approved Retirement De-List Bid clear in the Forward Capacity Auction. In the case of a Retirement De-List Bid rejected for reliability, if the reliability need that resulted in the rejection for reliability is met, the resource, or portion thereof, will be retired coincident with the end of Capacity Supply Obligation (or earlier as described in Section III.13.2.5.2.5.3(a)(ii)) unless the Commission directs that the obligation to retire be removed or the retirement date extended as part of an Incremental Cost of Reliability Service filing made pursuant to Section III.13.2.5.2.5.2. The interconnection rights, or relevant portion thereof, for the resource will terminate and the status of the resource, or portion thereof, will be converted to retired on the date of retirement, consistent with the provisions of Schedules 22 and 23 of the OATT.

(a)(ii) A resource, or portion thereof, that is to be retired pursuant to Section III.13.2.5.2.5.3(a)(i) may retire the resource, or portion thereof, earlier than the Capacity Commitment Period for which its Retirement De-List Bid was submitted if it is able to transfer the relevant Capacity Supply Obligation of

the resource to another resource through one or more approved Capacity Supply Obligation Bilateral transactions as described in Section III.13.5.1 or reconfiguration auctions as described in Section III.13.4.1. A resource, or portion thereof, electing to retire pursuant to this provision must notify the ISO in writing of its election to retire and the date of retirement. The interconnection rights, or relevant portion thereof, for the resource will terminate and the status of the resource, or portion thereof, will be converted to retired on the date of retirement, consistent with the provisions of Schedules 22 and 23 of the OATT.

(b)(i) A resource, or portion thereof, will be permanently de-listed from the Forward Capacity Market as of the relevant Capacity Commitment Period, or earlier as described in Section III.13.2.5.2.5.3(b)(ii), if the resource: (1) submitted an Internal Market Monitor-approved Permanent De-List Bid at or above the Forward Capacity Auction Starting Price and was not retained for reliablity pursuant to Section III.13.1.2.3.1.5.1; (2) elected conditional treatment pursuant to Section III.13.1.2.4.1(b) for a Permanent De-List Bid with a submitted price at or above the Capacity Clearing Price and was not retained for reliability pursuant to Section III.13.1.2.3.1.5.1; or (3) had a Commission-approved Permanent De-List Bid clear in the Forward Capacity Auction. The CNR Capability interconnection rights, or relevant portion thereof, for the resource will be adjusted downward to reflect the Permanent De-List Bid, consistent with the provisions of Schedules 22 and 23 of the OATT. A resource that permanently de-lists pursuant to this Section III.13.2.5.2.5.3(b)(i) is precluded from subsequent participation in the Forward Capacity Market unless it qualifies as a New Generating Capacity Resource pursuant to Section III.13.1.1.1.2.

(b)(ii) A resource, or portion thereof, that is to be permanently de-listed pursuant to Section III.13.2.5.2.5.3(b)(i) may be permanently de-listed earlier than the Capacity Commitment Period for which its Permanent De-List Bid was submitted if it is able to transfer the entire Capacity Supply Obligation of the resource to another resource through one or more approved Capacity Supply Obligation Bilateral transactions as described in Section III.13.5.1 or reconfiguration auctions as described in Section III.13.4.

(c) A resource that has never been counted as a capacity resource may retire the asset by notifying the ISO in writing of its election to retire and the date of retirement. The date specified for retirement is subject to the limit for resource inactivity set out in Section III.13.2.5.2.5.3(d). The interconnection rights for the resource will terminate and the status of the resource will be converted to retired on the date of retirement.

(d) A resource that does not operate commercially for a period of three calendar years will be deemed by the ISO to be retired. The interconnection rights for the unit will terminate and the status of the unit will be converted to retired on the date of retirement. Where a generator has submitted an application to repower under Schedule 22 or 23 of the OATT, the current interconnection space will be maintained beyond the three years unless the application under Schedule 22 or 23 is withdrawn voluntarily or by the operation of those provisions. Where an application is withdrawn under Schedule 22 or 23, the three year period will be calculated from the last day of commercial operation of the resource.

III.13.2.6. Capacity Rationing Rule.

Except for Dynamic De-List Bids, Export Bids, and offers from New Import Capacity Resources that are subject to rationing pursuant to Section III.13.1.3.5.8 and Existing Import Capacity Resources that are subject to rationing pursuant to Section III.13.1.3.3.A, offers and bids in the Forward Capacity Auction must clear or not clear in whole, unless the offer or bid specifically indicates that it may be rationed. A resource may elect to be rationed to its Rationing Minimum Limit pursuant to Sections III.13.1.1.2.2.3 and III.13.1.2.1.2. Offers from New Import Capacity Resources and Existing Import Capacity Resources will not be rationed where such rationing would violate any applicable physical minimum flow requirements on the associated interface. Export Bids may elect to be rationed generally, but regardless of such election will always be subject to potential rationing where the associated external interface binds. If more Dynamic De-List Bids are submitted at a price than are needed to clear the market, the bids shall be cleared pro-rata, subject to honoring the Rationing Minimum Limit of the resources. Where an offer or bid may be rationed, such rationing may not result in procuring an amount of capacity that is below the associated resource's Rationing Minimum Limit.

III.13.2.7. Determination of Capacity Clearing Prices.

The Capacity Clearing Price in each Capacity Zone shall be the price established by the descending clock auction as described in Section III.13.2.3, subject to the other provisions of this Section III.13.2. The Capacity Clearing Price for the Rest-of-Pool Capacity Zone and the Capacity Clearing Price for each import-constrained Capacity Zone shall not exceed the Forward Capacity Auction Starting Price. The Capacity Clearing Price for an export-constrained Capacity Zone shall not be less than zero.

III.13.2.7.1. Import-Constrained Capacity Zone Capacity Clearing Price Floor.

The Capacity Clearing Price in an import-constrained Capacity Zone shall not be lower than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone. If after the Forward Capacity Auction is conducted, the Capacity Clearing Price in an import-constrained Capacity Zone is less than the Capacity Clearing Price

in the Rest-of-Pool Capacity Zone, all resources clearing in the import-constrained Capacity Zone shall be paid based on the Capacity Clearing Price in the Rest-of-Pool Capacity Zone during the associated Capacity Commitment Period.

III.13.2.7.2. Export-Constrained Capacity Zone Capacity Clearing Price Ceiling.

The Capacity Clearing Price in an export-constrained Capacity Zone shall not be higher than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone. If after the Forward Capacity Auction is conducted, the Capacity Clearing Price in an export-constrained Capacity Zone is higher than the Capacity Clearing Price in the Rest-of-Pool Capacity Zone, all resources clearing in the export-constrained Capacity Zone shall be paid based on the Capacity Clearing Price in the Rest-of-Pool Capacity Zone during the associated Capacity Commitment Period.

III.13.2.7.3. [Reserved.]

III.13.2.7.3A. Treatment of Imports.

At the Capacity Clearing Price, if the amount of capacity offered from New Import Capacity Resources and Existing Import Capacity Resources over an interface between an external Control Area and the New England Control Area is greater than that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF):

(a) the full amount of capacity offered at that price from Existing Import Capacity Resources associated with contracts listed in Section III.13.1.3.3.A(c) shall clear, unless that amount of capacity is greater than the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), in which case the capacity offered at that price from Existing Import Capacity Resources associated with contracts listed in Section III.13.1.3.3.A(c) shall be rationed such that the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF) is not exceeded; and

(b) if there is space remaining over the interface after the allocation described in subsection (a) above, then the capacity offered at that price from New Import Capacity Resources and Existing Import Capacity Resources other than Existing Import Capacity Resources associated with the contracts listed in Section III.13.1.3.3.A(c) will be rationed such that the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II

HVDC-TF) is not exceeded. If the capacity offered at that price by any single New Import Capacity Resource or Existing Import Capacity Resource that is not associated with the contracts listed in Section III.13.1.3.3.A(c) is greater than the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the capacity offered by that resource that is above the interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF) shall not be included in the rationing.

III.13.2.7.4. Effect of Capacity Rationing Rule on Capacity Clearing Price.

Where the requirement that offers and bids clear or not clear in whole (Section III.13.2.6) prohibits the descending clock auction in its normal progression from clearing one or more Capacity Zones at the precise amount of capacity determined by the Capacity Zone Demand Curves specified in Section III.13.2.2, then the auctioneer shall analyze the aggregate supply curve to determine cleared capacity offers and Capacity Clearing Prices that seek to maximize social surplus for the associated Capacity Commitment Period. The clearing algorithm may result in offers below the Capacity Clearing Price not clearing, and in de-list bids below the Capacity Clearing Price clearing.

III.13.2.7.5. Effect of Decremental Repowerings on the Capacity Clearing Price.

Where the effect of accounting for certain repowering offers and bids (as described in Section III.13.2.3.2(e)) results in the auction not clearing at the lowest price for the required quantity of capacity, then the auctioneer will conduct additional auction rounds of the Forward Capacity Auction as necessary to minimize capacity costs.

III.13.2.7.6. Minimum Capacity Award.

Each offer (excluding offers from Conditional Qualified New Resources that do not satisfy the conditions specified in Sections III.13.2.5.1(i)-(iii)) clearing in the Forward Capacity Auction shall be awarded a Capacity Supply Obligation at least as great as the amount of capacity offered at the End-of-Round Price in the final round of the Forward Capacity Auction. For Intermittent Power Resources, the Capacity Supply Obligation for months in the winter period (as described in Section III.13.1.5) shall be adjusted based on its winter Qualified Capacity as determined pursuant to Section III.13.1.1.2.2.6 and Section III.13.1.2.2.2.

III.13.2.7.7. Tie-Breaking Rules.

Where the provisions in this Section III.13.2 for clearing the Forward Capacity Auction (system-wide or in a single Capacity Zone) result in a tie – that is, where two or more resources offer sufficient capacity at prices that would clear the auction at the same minimum costs – the auctioneer shall apply the following rules (in sequence, as necessary) to determine clearing:

(a) [Reserved.]

(b) If multiple projects may be rationed, they will be rationed proportionately.

(c) Where clearing either the offer associated with a resource with a higher queue priority at a Conditional Qualified New Resource's location or the offer associated with the Conditional Qualified New Resource would result in equal costs, the offer associated with the resource with the higher queue priority shall clear.

(d) The offer associated with the Project Sponsor having the lower market share in the capacity auction (including Existing Generating Capacity Resources, Existing Import Capacity Resources, and Existing Demand Capacity Resources) shall be cleared.

III.13.2.8. Capacity Substitution Auctions.

III.13.2.8.1. Administration of Substitution Auctions.

Following the completion of the primary auction-clearing process of the Forward Capacity Auction as provided for in Section III.13.2, the ISO shall conduct a substitution auction, using a static double auction to clear supply offers (offers to assume a Capacity Supply Obligation) and demand bids (bids to shed a Capacity Supply Obligation). Supply offers and demand bids will be modeled in the Capacity Zone where the associated resources are electrically interconnected.

III.13.2.8.1.1. Substitution Auction Clearing and Awards.

The substitution auction shall maximize total social surplus as specified by the demand bids and supply offers used in the auction. The maximization is constrained as follows:

(i) By the external interface limits modeled in the primary auction-clearing process.

(ii) Such that the net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is equal to zero.

(iii) Such that, for each import-constrained Capacity Zone, if the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction is less than the zone threshold quantity specified below, then the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is equal to zero; otherwise, the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is greater than or equal to the zone threshold quantity specified below.

(iv) Such that, for each export-constrained Capacity Zone, if the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction is greater than the zone threshold quantity specified below, then the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is equal to zero; otherwise, the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is less than or equal to the zone threshold quantity specified below.

In applying constraint (iii), the zone threshold quantity for an import-constrained Capacity Zone shall be equal to the sum of its Capacity Zone Demand Curve truncation point quantity specified in Section III.13.2.2.2 and the total quantity of any Export Bids and any Administrative Export De-List for which the exporting resource is located outside the import-constrained Capacity Zone, that are used to export capacity across an external interface connected to the import-constrained Capacity Zone, and that cleared in the primary auction-clearing process of the Forward Capacity Auction.

In applying constraint (iv), the zone threshold quantity for an export-constrained Capacity Zone shall be equal to its Capacity Zone Demand Curve truncation point quantity specified in Section III.13.2.2.3 less the total quantity of any Export Bids and any Administrative Export De-List Bids for which the exporting resource is located in the export-constrained Capacity Zone, that are used to export capacity across an external interface connected to either the Rest-of-Pool Capacity Zone or an import-constrained Capacity Zone, and that cleared in the primary auction-clearing process of the Forward Capacity Auction.

In applying constraints (iii) and (iv), a zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction and net cleared Capacity Supply Obligations

(total acquired less total shed) in the substitution auction shall include the Capacity Supply Obligations of Import Capacity Resources at each external interface connected to the Capacity Zone.

In cases in which there are multiple clearing outcomes that would each maximize the substitution auction's objective, the following tie-breaking rules will apply in the following sequence: (i) non-rationable demand bids associated with Lead Market Participants having the largest total FCA Qualified Capacity of Existing Capacity Resources will be cleared first; and (ii) rationable supply offers and demand bids associated with Proxy De-List Bids will be cleared in proportion to their offer or bid quantity.

For Intermittent Power Resources, other than those participating as the summer resource in a Composite FCM Transaction, the cleared award for supply offers and demand bids shall be adjusted for the months in the winter period (as described in Section III.13.1.5) using the ratio of the resource's cleared offer or bid amount divided by its FCA Qualified Capacity multiplied by its winter Qualified Capacity as determined pursuant to Section III.13.1.1.2.2.6 and Section III.13.1.2.2.2. Provided the resource's winter Qualified Capacity is not zero, the pro-rata adjustment will add to the amount of the cleared offer or bid award for the months in the winter period.

The cleared offer amount awarded to a Composite FCM Transaction in the substitution auction will be assigned to the summer and winter resources for their respective obligation months during the Capacity Commitment Period as described in Section III.13.1.5.

If, after the substitution auction, a resource has a Capacity Supply Obligation below its Economic Minimum Limit, it must meet the requirements of Section III.13.6.1.1.1.

III.13.2.8.1.2. Substitution Auction Pricing.

The substitution auction will specify clearing prices for Capacity Zones and external interfaces as follows.

For each import-constrained Capacity Zone, if the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is greater than its zone threshold quantity specified in Section III.13.2.8.1.1, then supply offers and demand bids in the substitution auction in the import-constrained Capacity Zone shall be treated as offers and bids in the Rest-of-Pool Capacity Zone for purposes of determining substitution auction clearing prices.

For each export-constrained Capacity Zone, if the sum of the zone's total Capacity Supply Obligations awarded in the primary auction-clearing process of the Forward Capacity Auction and the zone's net cleared Capacity Supply Obligations (total acquired less total shed) in the substitution auction is less than its zone threshold quantity specified in Section III.13.2.8.1.1, then supply offers and demand bids in the substitution auction in the export-constrained Capacity Zone shall be treated as offers and bids in the Rest-of-Pool Capacity Zone for purposes of determining substitution auction clearing prices.

The substitution auction clearing prices for the Rest-of-Pool Capacity Zone and for any constrained zones pooled with the Rest-of-Pool Capacity Zone for pricing purposes shall be determined by the price of the demand bid or supply offer that is marginal. If a demand bid associated with a Proxy De-List Bid is marginal, then the substitution auction clearing prices shall be set equal to the Capacity Clearing Prices.

The substitution auction clearing price for a constrained Capacity Zone that is not pooled with the Rest-of-Pool Capacity Zone for pricing purposes shall be determined by the price of the demand bid or supply offer associated with the separately-priced constrained Capacity Zone that is marginal. If a demand bid associated with a Proxy De-List Bid is marginal, then the substitution auction clearing price shall be set equal to the Capacity Clearing Price.

If the net quantity of Capacity Supply Obligations awarded in the primary Forward Capacity Auction and substitution auction over an interface between the New England Control Area and an external Control Area is less than that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then supply offers and demand bids in the substitution auction at the interface shall be treated as offers and bids in the modeled Capacity Zone associated with that interface for purposes of determining substitution auction clearing prices.

If the net quantity of Capacity Supply Obligations awarded in the primary Forward Capacity Auction and substitution auction over an interface between the New England Control Area and an external Control Area is equal to that interface's approved capacity transfer limit (net of tie benefits, or net of HQICC in the case of the Phase I/II HVDC-TF), then the substitution auction clearing price for that interface will be determined by the demand bid or supply offer that is marginal at that interface. If a cleared demand bid associated with a Proxy De-List Bid is marginal at the external interface, then the substitution auction clearing price for that interface shall be set equal to the Capacity Clearing Price for that interface.

The substitution auction clearing price at an external interface shall not exceed the substitution auction clearing price in the Capacity Zone connected to the external interface.

If, pursuant to the rules specified above, the substitution auction clearing price for any Capacity Zone or external interface would exceed the Capacity Clearing Price for that location, the substitution auction clearing price for that location only is set equal to its Capacity Clearing Price.

The substitution auction clearing price for any Capacity Zone or external interface cannot be less than negative one multiplied by the Forward Capacity Auction Starting Price.

III.13.2.8.2. Supply Offers in the Substitution Auction.

III.13.2.8.2.1. Supply Offers.

To participate as supply in the substitution auction, a Project Sponsor for a New Capacity Resource must meet the following criteria:

(a) The Project Sponsor and the New Capacity Resource must meet all the requirements for participation in the Forward Capacity Auction specified in Section III.13.1.

(b) The Project Sponsor must elect to have the resource participate in the substitution auction during the New Capacity Show of Interest Window. Pursuant to an election, the resource's total amount of FCA Qualified Capacity will be obligated to participate in the substitution auction, regardless of whether the resource's FCA Qualified Capacity was prorated pursuant to Section III.13.1.1.2.10, and subject to the other provisions of this Section III.13.2.8.2.

(c) The Project Sponsor must certify that the New Capacity Resource is a Sponsored Policy Resource as part of the submission of the New Capacity Qualification Package.

Substitution auction supply offers are rationable.

A resource participating in the Forward Capacity Auction as a New Generating Capacity Resource pursuant to Section III.13.1.1.1.2 (resources previously counted as capacity resources) is not eligible to participate as supply in the substitution auction.

A Composite FCM Transaction comprised of a summer resource that is a Sponsored Policy Resource is eligible to participate as supply in the substitution auction.

A Conditional Qualified New Resource may participate in the substitution auction provided that the resource with which it has overlapping interconnection impacts: (i) did not receive a Capacity Supply Obligation, fully or partially, in the primary auction-clearing process, and: (ii) is not eligible to participate in the substitution auction. A resource having a higher priority in the queue than a Conditional Qualified New Resource with which it has overlapping interconnection impact may participate in the substitution auction provided that the Conditional Qualified New Resource did not receive a Capacity Supply Obligation, fully or partially, in the primary auction-clearing process.

III.13.2.8.2.2. Supply Offer Prices.

Project Sponsors must submit substitution auction supply offer prices no later than five Business Days after the deadline for submission of offers composed of separate resources.

A substitution auction supply offer must be in the form of a curve (with up to five price-quantity pairs). The curve may not decrease in quantity as the price increases. A supply offer price for the substitution auction may not be greater than the Forward Capacity Auction Starting Price or lower than negative one multiplied by the Forward Capacity Auction Starting Price.

If the offer quantity does not equal the resource's FCA Qualified Capacity, the quantity for which no offer price was submitted will be assigned a price equal to the Forward Capacity Auction Starting Price.

III.13.2.8.2.3. Supply Offers Entered into the Substitution Auction

Supply offers for resources that satisfy all of the criteria in Section III.13.2.8.2.1 to participate in the substitution auction may be adjusted prior to conducting the substitution auction-clearing process using the following adjustments:

(a) Any portion of a resource's FCA Qualified Capacity that was cleared (received a Capacity Supply Obligation) in the primary auction-clearing process will be removed from the resource's substitution auction supply offer beginning with the lowest priced price-quantity pairs.

(b) After performing the adjustment specified in Section III.13.2.8.2.3(a), any price-quantity pairs in a resource's substitution auction supply offer with a price greater than the Capacity Clearing Price for the resource's Capacity Zone or external interface are removed from the offer.

III.13.2.8.3. Demand Bids in the Substitution Auction.

III.13.2.8.3.1. Demand Bids.

Market Participants with Existing Generating Capacity Resources or Existing Import Capacity Resources associated with External Elective Transmission Upgrades may elect to submit demand bids for the substitution auction for those resources by the Existing Capacity Retirement Deadline. The election must specify the total amount of the resource's Qualified Capacity that will be associated with its demand bid.

A resource must have achieved all of the milestones specified in Section III.13.1.1.2.2.2. no later than seven days after the issuance by the ISO of the qualification determination notification described in Section III.13.1.2.4(b) in order to participate as demand in the substitution auction.

Regardless of whether an election is made, a demand bid is required for any portion of a resource that is associated with a Retirement De-List Bid.

A resource for which a demand bid election has been made cannot participate in a Composite FCM Transaction and cannot be designated as a Self-Supplied FCA Resource.

Demand bids are non-rationable.

A demand bid will be entered into the substitution auction for the portion of the resource that receives a Capacity Supply Obligation in the primary auction-clearing process, subject to the other provisions of this Section III.13.2.8.3. A resource, or portion thereof, associated with a cleared demand bid shall be retired from all New England Markets (except that a resource, or portion thereof, associated with a cleared demand bid that is associated with a Proxy De-List Bid and a Permanent De-List Bid which has not been elected to retire pursuant to Section III.13.1.2.4.1(a) shall be retired only from the capacity market) at the start of the Capacity Commitment Period associated with the Forward Capacity Auction.

III.13.2.8.3.2. Demand Bid Prices.

Market Participants must submit substitution auction demand bid prices no later than five Business Days after the deadline for submission of offers composed of separate resources.

A substitution auction demand bid must be in the form of a curve (with up to five price-quantity pairs). The curve may not decrease in quantity as the price decreases. A demand bid price for the substitution

auction may not be greater than the Forward Capacity Auction Starting Price or lower than negative one multiplied by the Forward Capacity Auction Starting Price.

If the bid quantity does not equal the total bid amount submitted by the Market Participant or required for a Retirement De-List Bid pursuant to Section III.13.2.8.3.1, the quantity for which no bid price was specified will be assigned a price equal to negative one multiplied by the Forward Capacity Auction Starting Price.

III.13.2.8.3.3. Demand Bids Entered into the Substitution Auction.

If a resource is determined to be needed for reliability pursuant to Section III.13.2.5.2.5, then any demand bid associated with the resource will not be included in the substitution auction.

Demand bids for resources that satisfy all of the criteria in Section III.13.2.8.3.1 to participate in the substitution auction may be adjusted prior to conducting the substitution auction-clearing process using the following adjustments:

(a) Any portion of a resource's demand bid that exceeds its Capacity Supply Obligation awarded in the primary auction-clearing process will be removed from the substitution auction demand bid beginning with the highest priced price-quantity pairs.

(b) After performing the modification specified in Section III.13.2.8.3.3(a), any price-quantity pairs in a resource's substitution auction demand bid with a price greater than the Capacity Clearing Price for the resource's Capacity Zone or external interface will have its price reduced to the Capacity Clearing Price for the resource's Capacity Zone or external interface.

Except as provided in Section III.13.2.5.2.1(c), a rationable demand bid will be entered into the substitution auction on behalf of any Proxy De-List Bid associated with a Permanent De-List Bid or Retirement De-List Bid. The demand bid quantity will equal the portion of the Proxy De-List Bid that was not cleared (received a Capacity Supply Obligation) in the first run of the primary auction-clearing process. The demand bid will have priority to clear before non-rationable demand bids.

SECTION III

MARKET RULE 1

APPENDIX L

ISO NEW ENGLAND FUEL SECURITY RELIABILITY REVIEW STANDARD

As described in Section III.13.2.5.2.5A, a fuel security reliability review will be performed for certain submissions by Existing Generating Capacity Resources. This Appendix establishes the reliability trigger for that fuel security reliability review. This Appendix L will remain in effect for the 2022/23, 2023/24 and 2024/25 Capacity Commitment Period, after which this Appendix L will sunset.

The fuel security model used for reliability reviews shall consist of an hour-by-hour chronological simulation of the electric supply for the winter period from the beginning of December through the end of February. As applied to the fuel security reliability review model established pursuant to Appendix I of Planning Procedure No. 10, observation of either of the following will result in the generator being tested having its (i) Retirement De-List Bids, (ii) substitution auction demand bids, and (iii) certain bilateral transactions and reconfiguration auction demand bid offers rejected for reliability reasons:

(i) The retirement will result in the depletion of 10-minute reserves below 700 MW in any hour in the absence of a contingency in more than one liquefied natural gas supply scenario case or,

(ii) the use of load shedding in any hour pursuant to Operating Procedure No. 7.

Appendix I – Fuel-Security Reliability Review for Forward Capacity Market (FCM)

1. Purpose

This appendix will establish the process and criteria for evaluating the reliability impacts of FCM (a) Retirement De-List Bids, (b) substitution auction demand bids, (c) bilateral transactions, and (d) all reconfiguration auction demand bids on system fuel security as required by Section III.13.2.5.2.5A of the Tariff. The process for this fuel-security reliability review is set out in this Appendix I to PP10.

1.1 Term and Sunset of this Appendix I

This appendix shall remain in use for the period described in Section III.13.2.5.2.5A.a of the Tariff.

2. Timeline and Applicability

The timeline for and applicability for fuel security reliability reviews is set out at Section III.13.2.5.2.5A.b of the Tariff.

2.1 Input Review with Stakeholders

Each year in February or March, prior to the commencement of the fuel-security reliability review for a FCA, the ISO will discuss the inputs described in Section 3 below with the Reliability Committee.

2.2 ISO Notification of Fuel-Security Reliability Review Results to the Participant

The results of the fuel-security reliability review will be quantified in an ISO issued determination notification that is issued pursuant to Section III.13.2.5.2.5A.f of the Tariff.

2.3 ISO Notification and Review of Determination with Stakeholders

The ISO determinations described in Section III.13.2.5.2.5A.f will be reviewed with stakeholders, at the Reliability Committee, in the same general timeframe that resources retained for transmission security are reviewed, as outlined in PP-10, Section 7.6.

2.3.1 50/50 Load Informational Analysis Presentation

An informational fuel-security reliability review with a 50/50 peak load forecast from the most recent CELT will also be performed in all scenarios analyzed for units retained utilizing the 90/10 peak load forecast, and included in with the materials described in this Section 2.3. This analysis is not used for unit retention determinations.

3. Fuel-Security Reliability Review

The fuel-security review consists of an hour-by-hour chronological simulation of the New England electric supply systems for a winter period from the beginning of December through the end of February. One of the key assumptions driving the results of the review is the amount of natural gas available for electric generation.

Natural Gas Assessment

The fuel-security reliability review models natural-gas consumption on a daily basis. The primary, independent variable is average daily temperature converted to heating degree days (HDD). Given a daily temperature, the total gas demand for Residential, Commercial and Industrial (RCI) customers is established based on updated gas demand reports and the sources for serving this gas demand are based the following:

- Gas from Pipelines – The first source utilized for natural gas comes from the pipeline supply encompassing Algonquin, Tennessee, Iroquois, and Portland Natural Gas Transmission System (PNGTS) from the west and Sable Island and Deep Panuke from the east (both assumed to be inactive in the near future).

- Satellite Liquefied Natural Gas (LNG) – On cold days with 53 HDD or more, the model assumes that injections from gas Local Distribution Company (LDC) satellite LNG storage facilities will be activated in order to support the LDC behind-the-meter operations by increasing pressures and limiting draws from pipelines in accordance with their contractual agreements and supply plans.

- Pipeline Connected LNG – Any remaining needs of the LDCs are supplied by large pipeline-connected LNG facilities such as Canaport, Distrigas and the Excelerate buoy. Depending on the assumed daily "cap" on LNG vaporization (the cap is a proxy for LNG inventory management) all of the assumed sources are prorated by the same percentage (Factor = daily cap / total vaporization capability).

Once the gas LDC demand is served, the remaining amount of natural gas for electric generation – and its supply source – can be determined. If the gas LDC demand was 'low,' then pipeline gas may be available for electric generators. After the pipeline gas is fully utilized, the next source of gas for electric generation would be from unused pipeline connected LNG facilities. The maximum daily amount of gas available from both classes of supply to the electric sector is then passed to the Electric Sector Dispatch Model.

Electric Sector Dispatch Model

The maximum daily amount of natural gas available to the electric power sector is allocated to each hour using a heuristic algorithm to shape the available gas. The algorithm provides more gas during the higher load hours and less gas to lower load hours with the goal of ensuring that all of the available gas

would be consumed each day before turning to other liquid fuel resources. Separate accounting is done for gas supply available from pipelines and gas supply available from pipeline connected LNG facilities.

The amount of gas available from both sources in each hour is converted to available electric MWh in each hour assuming an average conversion efficiency of 7,400 Btu/kWh. This amount of MWhs from available gas is used by the dispatch algorithm where pipeline gas is used first and then resources using gas from vaporized LNG facilities are dispatched subsequently.

Electric Sector Load

The New England electric loads used in the model are based on the loads and temperatures experienced during the winter of 2014/15. All winter hourly loads are then scaled using the ratio of the forecast 90/10 peak demand (net of Energy Efficiency) for the applicable future Capacity Commitment Period year to the observed peak in the historical benchmark year (2014/15).

Reserves

Thirty-Minute Operating Reserves and Ten-Minute Operating Reserves are being served by the distillate oil-only resources with the highest heat rates, which are the best suited to providing reserves.

Resource Availability

The fuel-security model does not assume any scheduled outages. Random unavailability due to forced outages and derates is treated by "derating" the capacity of a resource by an Equivalent Forced Outage Rate on Demand (EFORd) utilizing the ISO's Generating Availability Data System (GADS) data as described below.

Dispatch Order

Energy to serve the load comes from dispatching the resources in an economic order reflecting winter conditions. Wind and Photovoltaics (PV) are dispatched first using profiles adjusted to reflect expected amounts of those resources as described in the Static Inputs below. Other renewables such as wood, biomass and municipal solid waste are then assumed to be dispatched next, followed by nuclear resources and then coal generators; the Seasonal Claimed Capability of these resource technologies is based from the most recent CELT report as described in the Static Inputs below. Pumped storage is dispatched next using a daily pumped storage profile used to reflect the characteristic operation of this resource by storing energy during low load periods and generating energy during the higher load periods as described below in the Static Inputs.

Next, conventional hydro-electric generation is dispatched as a constant MW amount in all hours based on average hydro conditions as described in the Static Inputs below. This is followed by the dispatch of imports as a constant MW resource in accordance with assumptions set forth in Section A below.

Next, the aggregate natural gas only resources are dispatched on pipeline gas in each hour, subject to the hourly availability of pipeline gas MWhs. If there is remaining pipeline gas, it is used by the gas-fired, dual-fueled, combined-cycle resources to serve remaining energy demands until the gas MWhs are exhausted.

Next in the dispatch order are the natural-gas only resources that would be dispatched on pipeline-connected-LNG gas, subject to the hourly availability of pipeline-connected-LNG gas MWhs. If there is remaining pipeline-connected-LNG gas, it is used by the gas-fired, dual-fueled, combined-cycle resources to serve remaining energy demands until the pipeline-connected-LNG gas MWhs are exhausted.

If more load still needs to be served, the dual-fueled combined cycle resources that have not been previously dispatched on pipeline or pipeline-connected-LNG are dispatched on distillate oil, subject to fuel in a specific generator's associated oil tank as determined in Section A below.

Next in the dispatch order are the distillate only generators not held for reserve and residual oil generators, subject to fuel in a specific generator's oil tank determined in Section A below.

Last, the dispatch of demand response resources will be applied to the unmet energy.

Any remaining energy not served is then converted to MWhs of Operating Procedure – 4 Actions, Ten-Minute Reserve Depletion and Operating Procedure – 7 Load Shed.

The following inputs will be used when performing the fuel-security reliability reviews.

A. STATIC INPUTS

A fuel-security reliability review will utilize the following static inputs:

i. **Peak Load:** This is calculated using the most recently available CELT Net 90/10 winter peak load (including the effects of energy efficiency) as presented to the Participants Advisory Committee (PAC) in the March timeframe, prior to the annual issuance of the CELT report on May 1.

ii. **Winter Energy Profile:** The hourly system demand from the 2014/2015 winter will be used to create an hourly load shape by using the ratio of the CELT peak load for the relevant Capacity Commitment Period to the 2014/2015 winter peak load. The hourly temperature from the 2014/2015 winter will be used as the modeled hourly temperature.

iii. **LDC Gas Demand:** Set for modeled Capacity Commitment Period with future year total forecasted LDC gas demand held constant from last known Integrated Resource Plan based on vendor-supplied information annually.

iv. **Pipeline Capacity:** Set for modeled Capacity Commitment Period based on vendor-supplied information annually.

v. **Satellite LNG facility vaporization:** Set for modeled year based on vendor-supplied information annually.

vi. **Oil-Only inventory levels:** Set to levels determined using the most recent December fuel surveys submitted to the ISO. Tank inventories then will be assumed to be replenished with one

proxy tanker truck per hour when the reorder level is reached. The reorder level is provided using the most recent fuel survey.

vii. **Resource Seasonal Claim Capability:** The winter Seasonal Claimed Capability (MW) from the most recently published CELT report for all Existing Generating Capacity Resources qualified for the instant FCA and energy-only generators active in ISO New England markets. For non-commercial Existing Generating Capacity Resources that are not in the CELT report, the fuel-security reliability review will use the resource's winter Qualified Capacity.

viii. **PV Forecast:** The PV Forecast-Nameplate, year of analysis, and the sum of Markets Total Cumulative and Behind-the-Meter Total Cumulative values from the most recently available CELT report.

ix. **Wind Resource Nameplate:** Based on the most recently available CELT report and Existing Generating Capacity Resources with a Primary Fuel Type = WND, where the sum of the Nameplate (MW) values will be used.

x. **Sun Profile:** The ISO will use the observed hourly profile from the winter of 2014/2015, adjusted to reflect the expected performance of the fleet assumed in service in the study year, and updated annually.

xi. **Onshore Wind Profile:** The ISO will use the observed hourly profile from the winter of 2014/2015, adjusted to reflect the expected performance of the fleet assumed in service in the study year, and updated annually.

xii. **Offshore Wind Profile:** The ISO will use an hourly profile reflecting the expected performance of the fleet assumed in service in the study year as though it had been in operation in the winter of 2014/2015, and updated annually.

xiii. **Demand Response Resources:** The winter Seasonal Claimed Capability (MW) reduction value from active Demand Response Resources.

xiv. **EFORd:** The ISO calculated Equivalent Forced Outage Rate on Demand (EFORd) utilizing the ISO's Generating Availability Data System (GADS) data. EFORd will be applied to Seasonal Claimed Capability, vii above, in the same manner it is applied for ICR and related values calculations.

xv. **OP-4 Action MW:** Estimated hourly MW relief for each action of OP-4.

xvi. **Export De-List Bids and Administrative Export Bids:** Resource capacity associated with Export De-List Bids and Administrative Export Bids qualified for the instant FCA will not be included as capacity available to ISO to meet internal New England load, and these bids will not be modeled.

xvii. **Pumped Storage:** Set to levels using a daily pumped storage profile used to reflect the characteristic operation of this resource by storing energy during low load periods and generating energy during the higher load periods.

xviii. **Conventional Hydro-Electric Generation:** This resource is dispatched at an hourly output based on the weighted average hydro Capacity Factor calculated using the latest 5-year NERC EFORd Capacity Factor Class Averages for HYDRO 1-29 and HYDRO 30 Plus.

B. VARIABLE INPUTS:

The fuel-security reliability review will consider the following variable inputs:

i. **Imports:** Imports for this review will be defined as the total net flow across the NY-NE, NB-NE and HQ-NE interfaces. The values are set at 2,800 MW, 3,000 MW, and 3,500 MW and will be utilized in separate scenarios.

ii. **LNG Injections:** LNG injections for this review will be defined as the total LNG injected into the pipeline transmission system by the region's three available LNG facilities, Canaport, Distrigas and Buoy. The values are set at 0.8 Bcf, 1.0 Bcf and 1.2 Bcf and will be utilized in separate scenarios.

iii. **Dual-Fuel resource tank inventory:** Dual-Fuel resource tank inventory for this review will be defined as a multiplier for the onsite fuel-storage tank of the individual resource. The values are set at 1.25 and 2 and will be utilized in separate scenarios. When the value is set to 1.25, the onsite available fuel for the individual resources will be set to 125% capacity of the individual resources' tanks at the start of the analysis. When the value is set to 2, the onsite available fuel for the individual resources will be set to 200% capacity of the individual resources' tanks at the start of the analysis.

The variable inputs in this section can be changed based upon historical trends, new infrastructure, fuel surveys and as the ISO deems necessary, and the information will be provided to the Reliability Committee in accordance with section 2 above.

C. SYSTEM MODEL STARTING POINT

The model will include all new resources that have a binding and enforceable contract under a state procurement to be in-service by the December 1 of the associated Capacity Commitment Period that, by the time the fuel-security reliability review is conducted, have submitted the certification described in Section 10 of PP10, pursuant to Section 4.1(f) of Attachment K to Part II of the Tariff. The model will take into consideration any obligation(s) to operate under these contracts, or lack thereof, regarding energy deliveries specific to winter stress conditions being reviewed for fuel security.

Table 1 – Timetable for ISO Notification to Include Resources in the Fuel Security Reliability Review

Date	CCP13 2022-2023	CCP14 2023-2024	CCP15 2024-2025	Submission of Certification of Contractual Commitment from Resources being built in accordance with Attachment K to the ISO*
Receipt of FERC order for FCA 13				Sep-15-18
Feb-19	FCA			Jan-15-19
Feb-20		FCA		Jan-15-19
Jun-20	ARA1			Apr-15-20

Feb-21			FCA	Jan-15-20
Jun-21		ARA1		Apr-15-21
Aug-21	ARA2			Jun-15-21
Mar-22	ARA3			Jan-15-22
Jun-22			ARA1	Apr-15-22
Aug-22		ARA2		Jun-15-22
Mar-23		ARA3		Jan-15-23
Aug-23			ARA2	Apr-15-23
Mar-24			ARA3	Jan-15-24

*If the notification to ISO indicates the contract for the resource is pending regulatory approval of the state's review, the ISO will require an update 5 business days prior to the auction or prior to the retirement delist bid deadline that the pending contracts have been approved. If the notification timeline is not met, the resources will be removed from the model for the given auction for fuel-security reliability review.

D. ORDER OF REVIEW

Bids reviewed for fuel-security will be reviewed in the order prescribed by Section III.13.2.5.2.5A.d of the Tariff.

E. RESULTS OF THE FUEL-SECURITY RELIABILITY REVIEW

The fuel-security reliability review results will document the following metrics per scenario:

- OP-4 Action 1 MWh
- OP-4 Action 1 Hours
- OP-4 Actions 2-5 MWh
- OP-4 Actions 6-11 MWh
- 10 - Minute Reserve Depletion MWh
- 10 - Minute Reserve Depletion Hours
- 10 - Minute Reserve Depletion less than 700 MW in Hours
- OP-7 Action: Load Shedding MWh
- OP-7 Action: Load Shedding Hours
- OP-7 Action: Load Shedding Individual Days

Hourly curves profiling the MWh of OP-4 Actions and OP-7 Actions across the applicable analyzed winter period will also be documented.

4. <u>Reliability Need for a Generator Based on Fuel-Security Reliability Review Results</u>

The ISO New England fuel-security reliability review standard is set out at Appendix L of Section III of the Tariff. Results from the testing described in this Planning Procedure 10, Appendix I will be measured against the trigger set out in that Appendix L.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in EL18-182-000.

Dated at Holyoke, Massachusetts this 31st day of August, 2018.

/s/ Julie Horgan
Julie Horgan
eTariff Coordinator
ISO New England Inc.
One Sullivan Road
Holyoke, MA 01040
(413) 540-4683