



November 27, 2012

**BY ELECTRONIC FILING**

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

RE: **ISO New England Inc. and New England Power Pool, Docket No. ER13-000, Market Rule 1 Revision Relating to the Procurement of Ten-Minute Non-Spinning Reserve in the Forward Reserve Market**

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act (“Section 205”),<sup>1</sup> ISO New England Inc. (the “ISO”), joined by the New England Power Pool (“NEPOOL”) Participants Committee<sup>2</sup> (together, the “Filing Parties”),<sup>3</sup> hereby electronically submits this transmittal letter and revised Tariff sections to address a change in the procurement of Ten-Minute Non-Spinning Reserve in New England’s Forward Reserve Market (the “TMNSR Procurement Revision”). The ISO also submits herewith the supporting testimony of Christopher A. Parent (the “Parent Testimony”), which is sponsored solely by the ISO.<sup>4</sup> As addressed in Section II of this transmittal letter, the Filing Parties request an effective date of March 1, 2013 for the TMNSR Procurement Revision.

The Filing Parties are submitting a revision to the Forward Reserve Market rules to permit the procurement of additional Ten-Minute Non-Spinning Reserve, or TMNSR,

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<sup>1</sup> 16 U.S.C. § 824d (2006 and Supp. II 2009).

<sup>2</sup> Capitalized terms used but not defined in this filing are intended to have the meaning given to such terms in the ISO New England Inc. Transmission, Markets and Services Tariff (the “Tariff”), the Second Restated New England Power Pool Agreement, and the Participants Agreement. Market Rule 1 is Section III of the Tariff.

<sup>3</sup> Under New England’s Regional Transmission Organization (“RTO”) arrangements, the rights to make this filing of changes to the Market Rule under Section 205 of the Federal Power Act are the ISO’s. NEPOOL, which pursuant to the Participants Agreement provides the sole Participant Processes for advisory voting on ISO matters, supported the changes reflected in this filing and, accordingly, joins in this Section 205 filing.

<sup>4</sup> Mr. Parent is the Manager of the Market Development Department for the ISO.

in the Forward Reserve Market. As discussed more fully in this transmittal letter, procuring additional TMNSR in the Forward Reserve Market will help ensure the availability of sufficient reserves in real-time.

## **I. THE TMNSR PROCUREMENT REVISION IN CONTEXT<sup>5</sup>**

The TMNSR Procurement Revision is designed to help address emerging concerns over resource performance. This revision is another step in a series of operational and market improvements that the ISO is working on with stakeholders. The ISO expects the series of changes to occur in three phases—immediate changes, intermediate-term changes, and long-term changes. Each set of proposed changes will be taken through the full stakeholder process as they are developed. In this proceeding, the Commission is requested to rule on the TMNSR Procurement Revision. To provide context, this section of the filing letter identifies the ISO's additional proposals for addressing its concerns with resource performance and gas-electric coordination, and the role of the TMNSR Procurement Revision relative to those proposals.

The ISO's concerns are prompted by two sets of related issues in New England. First, generation resource operations during periods of stressed system conditions during 2010 and early 2011 revealed that many resources did not perform at the levels of their offered parameters. Second, New England's increased reliance on natural gas-fueled generation raises questions for the ISO about whether the wholesale electricity markets require enhancements to ensure both reliability and market efficiency given the structure of the gas markets and the risks of increasing reliance on the supply of natural gas.

The ISO's analysis of operational performance of existing resources during stressed system conditions—times when resources' performance is essential to reliability—indicates that older units that are relied upon for peaking service, ramping or reserves are sometimes not performing to the full extent of their offered parameters.<sup>6</sup> These shortcomings became manifest in operational events on June 24, 2010, September 2, 2010, and January 24, 2011 (including a NERC violation related to inadequate generation contingency response on September 2, 2010).<sup>7</sup> More generally, an

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<sup>5</sup> Section I of this transmittal letter reflects the current plans of the ISO for proposing a series of ISO Tariff changes, the majority of which have yet to be presented to stakeholders or taken through the complete stakeholder process. Accordingly, NEPOOL is not in a position to join in providing this information in Section I and has not voted on ISO's plans for changes to the markets except as indicated with respect to particular proposals. Additionally, we note that a focus group has been formed between the electric and gas industries to address issues relating to the coordination of activities in these two industries.

<sup>6</sup> *Strategic Planning Risk Summary* (21 April 2011), p. 4, available at [http://www.iso-ne.com/committees/comm\\_wkgrps/strategic\\_planning\\_discussion/materials/spd\\_risk\\_summary\\_apr\\_2011.pdf](http://www.iso-ne.com/committees/comm_wkgrps/strategic_planning_discussion/materials/spd_risk_summary_apr_2011.pdf).

<sup>7</sup> *Id.*, p. 4.

examination of dispatch response performance following the 36 largest system contingency events over the last three years indicates that, on average, the response rate for New England's non-hydro generation resources was less than 60% of the amount requested during the events. The non-hydro generators that were dispatched to address these contingencies were largely fast-start resources and spinning reserve resources, and the dispatch performance during these events is a low response rate for resources that are tasked with providing reserves in New England. In sum, at times of greatest need, many resources delivered below the performance ability represented in their offer data.

Increased demand for natural gas in New England has increased competition for the use of the natural gas pipelines and has made it more difficult for generators to obtain natural gas for power generation.<sup>8</sup> Since the opening of wholesale markets in the late 1990s there have been approximately 12,000 MW of combined cycle units built in New England, all fueled by natural gas. The vast majority of this capacity relies on non-firm gas transportation (*i.e.* transportation released as-available by the holders of long-term firm transportation rights) to obtain the natural gas. In 2000, natural gas supplied 15% of New England's electricity. That increased to 51% in 2011. During this period the demand for natural gas for space heating also grew.<sup>9</sup>

The increased reliance on natural gas-fueled generation has heightened ISO concerns regarding risks to reliability. In various instances natural-gas fueled generators have not provided energy when dispatched, claiming that they were unable to procure natural gas or transportation services or that the gas was too expensive in real-time. As a result, the ISO has concerns that generators which are being counted on for reserves may not be able to provide energy if needed. As the region continues to rely more heavily on gas, and with the potential for unit retirements that could remove the capacity surplus that has existed in New England in recent years, the risks from these circumstances will increase, in particular when coupled with more conventional contingencies that New England has traditionally experienced. The ISO is exploring with its stakeholders changes to the New England markets designed to address these reliability concerns.

As explained above, the ISO plans to propose three phases of market rule changes to address resource performance and market efficiency issues: near-term changes that can be implemented quickly; intermediate-term changes that could be implemented in the next year; and longer-term changes that could be implemented over the course of the next

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<sup>8</sup> In the summer of 2012, the ISO released a white paper that reviews the reliability issues posed by New England's increasing dependence on gas-fired generators. The white paper discussed the issues and presented a number of possible solutions to mitigate the risks. *See* ISO New England Inc., Addressing Gas Dependence, July 2012, *available at* [http://www.iso-ne.com/committees/comm\\_wkgrps/strategic\\_planning\\_discussion/materials/natural-gas-white-paper-draft-july-2012.pdf](http://www.iso-ne.com/committees/comm_wkgrps/strategic_planning_discussion/materials/natural-gas-white-paper-draft-july-2012.pdf).

<sup>9</sup> The increase in demand for natural gas was helped by a decrease in the price of shale gas delivered from west of New England, an increase in the price of coal and continued high prices for oil.

two to three years. The ISO will be working with stakeholders to review these proposals, and it is possible that further consideration will indicate that modifications, or alternative courses of action to those described below, are more appropriate. The following summarizes the ISO's currently planned proposals:<sup>10</sup>

Near-Term Changes:

- Increasing Ten-Minute Non-Spinning Reserve to be procured in the Forward Reserve Market. In July 2012, the ISO increased the amount of Ten-Minute Non-Spinning Reserve it requires in real-time operation of the system in response to the historical performance of reserve resources. Currently, the Forward Reserve Market provides for the advanced procurement of an amount of Ten-Minute Non-Spinning Reserve equal to 50% of the first largest contingency. Permitting an additional amount of reserve to be procured in the Forward Reserve Market will help support the availability of reserves to meet the increased real-time reserve requirements. This change received support by stakeholders and comprises the TMNSR Procurement Revision being filed herewith.
- Modifying generation resource auditing requirements and procedures. These proposed modifications—filed with the Commission on November 6, 2012—are intended to provide the ISO with a more accurate assessment of the 10 and 30 minute reserve capability of reserve resources, which should work in conjunction with the modifications to the real-time reserve requirements and the proposal to modify the forward reserve requirements to ensure sufficient reserve resources.
- Allowing the ISO to share information concerning the scheduled output of natural gas-fired generation resources with the operating personnel of the interstate natural gas pipeline companies serving New England. The ISO has concluded that, by sharing expected generation output schedules confidentially with the pipeline operators, the pipeline operators may be able to provide confidential information to the ISO operators on gas availability that will allow the ISO to better anticipate and address potential reliability problems in the event that there is insufficient fuel for all gas-fired generators to meet their schedules. Proposed revisions to the Information Policy were filed with the Commission on Tuesday, November 13, 2012.
- Accelerating the closing time of the Day-Ahead Energy Market. Currently, the Day-Ahead Energy Market closes at noon on the day before the Operating Day, and the Resource Adequacy Analysis process does not commit resources until at least 10:00 p.m., by which time the gas market and associated nomination cycles have closed. The ISO has proposed and stakeholders are reviewing currently a

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<sup>10</sup> The ISO also is evaluating whether to propose additional changes to address the concerns discussed above.

plan for accelerating the closing of the day-ahead market to allow the ISO to commit long lead-time resources earlier and to allow participants with gas-fired resources to learn their next-day commitments earlier so that they are able to procure gas based on those commitments.

Intermediate-Term Changes (expected to be presented for stakeholder consideration within the next year):

- Tightening the FCM Shortage Event Trigger. The ISO is discussing with stakeholders tightening the Shortage Event trigger in the Forward Capacity Market to ensure that a Shortage Event is triggered earlier in a period of reserve deficiency. Currently, the Shortage Event is triggered when there has been a deficiency in ten-minute operating reserve for 30 or more minutes. The ISO plans to propose market rule changes to address these modifications in the first half of 2013.
- Allowing Market Participants to change offers in real-time. Currently, participants are permitted to submit re-offers (*i.e.*, to modify offers used in the Day-Ahead Energy Market) only during a two-hour period starting at 4:00 p.m. on the day before the Operating Day. No re-offers are permitted during the Operating Day. The ISO plans to propose allowing re-offers to take place during the Operating Day, which will improve a resource's ability to reflect in its energy market offer the cost of obtaining fuel intra-day. Offers which are more reflective of actual fuel prices will improve energy market price signals and will permit a better match between those prices and the cost of procuring fuel in real-time. The ISO plans to propose market rule changes to allow for intra-day reoffers for discussion with stakeholders during the first half of 2013.
- Considering procurement of additional intra-day reserve capability. To address the fuel dependence risk between now and when the ISO implements the longer-term Forward Capacity Market revisions, the ISO is considering procuring additional intra-day reserve capability. By providing incentives for additional capacity that can be committed and dispatched within the Operating Day, the ISO can reduce the reliability risks posed by intra-day operating problems and reduce the costs of out-of-merit dispatch. The ISO is evaluating the feasibility of intra-day reserve procurement and plans to review required market rule changes with stakeholders during the first half of 2013.

Long Term Changes:

- Redesigning Forward Capacity Market performance penalties. The ISO is planning to propose Forward Capacity Market changes to provide Market Participants with greater incentives and the capital to meet their Supply Offer obligations. The ISO has recently issued a white paper reflecting its planned proposal to change the structure of the incentives and penalties that would apply

when the system is short of reserves, and for the penalties to be large enough to justify investment to improve the reliability of a resource's fuel supply.<sup>11</sup> The ISO has begun receiving stakeholder feedback on this white paper and currently intends to propose market rule changes for stakeholder consideration in 2013.

## **II. REQUESTED EFFECTIVE DATE**

The Filing Parties are requesting that the Commission accept the TMNSR Procurement Revision as filed, without suspension or hearing, to be effective on March 1, 2013.<sup>12</sup>

## **III. DESCRIPTION OF THE FILING PARTIES; COMMUNICATIONS**

The ISO is the private, non-profit entity that serves as the regional transmission organization ("RTO") for New England. The ISO operates the New England bulk power system and administers New England's organized wholesale electricity market pursuant to the Tariff and the Transmission Operating Agreement with the New England Participating Transmission Owners. In its capacity as an RTO, the ISO has the responsibility to protect the short-term reliability of the New England Control Area and to operate the system according to reliability standards established by the Northeast Power Coordinating Council ("NPCC") and the North American Electric Reliability Council ("NERC").

NEPOOL is a voluntary association organized in 1971 pursuant to the New England Power Pool Agreement, and it has grown to include more than 430 members. The Participants include all of the electric utilities rendering or receiving service under the Tariff, as well as independent power generators, marketers, load aggregators, brokers, consumer-owned utility systems, end users, demand resource providers, developers and a merchant transmission provider. Pursuant to revised governance provisions accepted by the Commission,<sup>13</sup> the Participants act through the NEPOOL Participants Committee. The Participants Committee is authorized by Section 6.1 of the Second Restated NEPOOL Agreement and Section 8.1.3(c) of the Participants Agreement to represent NEPOOL in proceedings before the Commission. Pursuant to Section 2.2 of the Participants Agreement, "NEPOOL provide[s] the sole Participant Processes for advisory voting on ISO matters and the selection of ISO Board members, except for input from state regulatory authorities and as otherwise may be provided in the Tariff, TOA and the Market Participant Services Agreement included in the Tariff."

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<sup>11</sup> Available at [http://www.iso-ne.com/committees/comm\\_wkgrps/strategic\\_planning\\_discussion/materials/fcm\\_performance\\_white\\_paper.pdf](http://www.iso-ne.com/committees/comm_wkgrps/strategic_planning_discussion/materials/fcm_performance_white_paper.pdf).

<sup>12</sup> 18 C.F.R. § 35.3.

<sup>13</sup> *ISO New England Inc., et al.*, 109 FERC ¶ 61,147 (2004).

All correspondence and communications in this proceeding should be addressed to the undersigned for the ISO as follows:

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#### IV. STANDARD OF REVIEW

These changes are being submitted pursuant to Section 205, which “gives a utility the right to file rates and terms for services rendered with its assets.”<sup>15</sup> Under Section 205, the Commission “plays ‘an essentially passive and reactive role’”<sup>16</sup> whereby it “can reject [a filing] only if it finds that the changes proposed by the public utility are not ‘just and reasonable.’”<sup>17</sup> The Commission limits this inquiry “into whether the rates proposed by a utility are reasonable - and [this inquiry does not] extend to determining whether a

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<sup>14</sup> Due to the joint nature of this filing, the Filing Parties respectfully request a waiver of Section 385.203(b)(3) of the Commission’s regulations to allow the inclusion of more than two persons on the service list in this proceeding.

<sup>15</sup> *Atlantic City Elec. Co. v. FERC*, 295 F. 3d 1, 9 (D.C. Cir. 2002).

<sup>16</sup> *Id.* at 10 (*quoting City of Winnfield v. FERC*, 744 F.2d 871, 876 (D.C. Cir. 1984)).

<sup>17</sup> *Id.* at 9.

proposed rate schedule is more or less reasonable than alternative rate designs.”<sup>18</sup> The changes proposed herein “need not be the only reasonable methodology, or even the most accurate.”<sup>19</sup> As a result, even if an intervenor or the Commission develops an alternative proposal, the Commission must accept this Section 205 filing if it is just and reasonable.<sup>20</sup>

## V. THE TMNSR PROCUREMENT REVISION

### A. Background

#### 1. *Increase in Real-Time Reserve*

In the summer of 2012, the ISO increased the amount of 10-minute reserves it maintains in real-time in recognition of increased concerns over reserve resource performance. Prior to this increase, the ISO maintained a 10-minute reserve level that assumed 100% performance of a reserve resource’s offered capability. An historical analysis performed by the ISO indicated that many reserve resources often provide less than 100% of their claimed 10-minute reserve capability when dispatched in response to a contingency.<sup>21</sup> Since NERC Balancing Standards for reserves utilize performance based criteria requiring activation of an adequate level of reserves to cover at least the largest contingency,<sup>22</sup> the ISO modified the amount of 10-minute reserves it requires in real-time to reflect a 20% average fleet-wide historical non-performance of resources called upon to address a contingency (*i.e.*, resources providing 10-minute reserves).<sup>23</sup>

#### 2. *TMNSR Procurement in the Forward Reserve Market*

The Forward Reserve Market is a market-based method for forward procurement of two reserve products, Ten-Minute Non-Spinning Reserve, or TMNSR, and the Thirty-Minute Operating Reserve, or TMOR.

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<sup>18</sup> *City of Bethany v. FERC*, 727 F.2d 1131, 1136 (D.C. Cir. 1984).

<sup>19</sup> *Oxy USA, Inc. v. FERC*, 64 F.3d 679, 692 (D.C. Cir. 1995).

<sup>20</sup> *Cf. Southern California Edison Co., et al*, 73 FERC ¶ 61,219 at 61,608 n.73 (1995) (“Having found the Plan to be just and reasonable, there is no need to consider in any detail the alternative plans proposed by the Joint Protesters.” (*citing Bethany*)).

<sup>21</sup> As Mr. Parent notes in his testimony, this type of underperformance was a contributing factor in the Disturbance Control Standard violation experienced by the ISO on September 2, 2010. Parent Testimony at pp. 3-4.

<sup>22</sup> In order to meet the requirements of NERC Reliability Standard BAL-002, R2, the ISO utilizes NPCC Directory 5 Reserve requirements, which include the requirement to “have ten-minute reserve available to [the Balancing Authority] that is at least equal to its first contingency loss.”

<sup>23</sup> *Id.*



The Forward Reserve Market consists of Forward Reserve Auctions held twice per year, one for each seasonal delivery period, summer (June 1<sup>st</sup> – September 30<sup>th</sup>) and winter (October 1<sup>st</sup> -May 31<sup>st</sup>). The Forward Reserve Auction, through a cost-minimizing uniform-price algorithm, sets a clearing price for each reserve product in each Reserve Zone. The Forward Reserve Auction seeks to procure sufficient reserve obligations in order to satisfy the New England system-wide TMNSR requirement, the New England system-wide TMOR requirement, and any local TMOR requirement in a Reserve Zone. Market Participants whose offers clear in the Forward Reserve Auction receive Forward Reserve Obligations on a portfolio basis. The portfolio obligations are not tied to a specific resource until near real time when the Market Participant assigns the actual resource that will be available to deliver reserve and energy for the particular operating day.<sup>24</sup>

The current Forward Reserve Market rules call for the ISO to procure in each Forward Reserve Auction an amount of TMNSR equal to 50% of a forecast of New England's largest first contingency.<sup>25</sup> The ISO evaluates the size of the largest first contingency over a recent historical period to determine the appropriate forecast value. The largest first contingency has fluctuated between 1600 and 1800 since 2010.<sup>26</sup>

#### **B. Increasing the Amount of TMNSR Procured in the Forward Reserve Market**

The TMNSR Procurement Revision adds a provision to the Forward Reserve Market rules to increase the amount of TMNSR if system conditions forecasted for the Forward Reserve Procurement Period indicate an amount of TMNSR equal to 50% of the forecasted largest first contingency would be insufficient, on its own, to meet Real-Time Operating Reserve requirements. Increasing the amount of TMNSR procured in the Forward Reserve Market supports the July 2012 increase in real-time reserves by ensuring that sufficient reserve resources are procured in the Forward Reserve Market with the performance incentives of the Forward Reserve Market, and subsequently are available in real-time to respond to system contingencies.<sup>27</sup>

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<sup>24</sup> Market Participants face a Failure to Reserve penalty if they fail to “assign” resources or if the assigned resources are unavailable to meet a Forward Resource Obligations. Market Participants with resources that fail to perform to their Forward Reserve Market obligations face a failure to perform penalty for any underperformance. Thus, the Forward Reserve Market creates incentives to make reserve resources available and ready to respond in real-time in the event of a contingency.

<sup>25</sup> Market Rule 1, Section III.9.2.1.

<sup>26</sup> Parent Testimony at pp. 5-6.

<sup>27</sup> *Id.* at p. 6.

Under the proposed revision, the ISO will continue to use 50% of the largest contingency to determine the minimum amount of TMNSR in the Forward Reserve Market, but this amount will be increased as necessary to account for two factors: (a) any historical under-performance of Resources dispatched in response to a system contingency and (b) the likelihood that more than one half of the forecasted first contingency supply loss will be satisfied using TMNSR.

The rationale for the first factor—accounting for the historical underperformance of reserve resources—is straightforward: doing so will help ensure that the resources available to provide reserves in real-time have sufficient reserve capacity to meet real-time reserve requirements despite the likelihood that some portion of the reserve-designated resources will under-perform.<sup>28</sup>

The second factor—*i.e.*, considering the amount of TMNSR that is likely to be used in real-time to restore a first contingency supply loss—will help take account of changes in system conditions and changes in New England’s fleet of reserve resources. As operating conditions in New England change, and as the mix of resources available to provide reserves changes, the likelihood that a major supply loss will be restored through activation of spinning (online) vs. non-spinning (offline) reserves also changes. Since conditions and resource mix are not static, it is appropriate to factor into the TMNSR procurement for the Forward Reserve Market the possibility that system conditions and the resource mix will be such that more than 50% of a first contingency loss will be restored through the use of TMNSR. The proposed TMNSR Procurement Revision account for such an analysis.<sup>29</sup>

For the foregoing reasons, the TMNSR Procurement Revision is just and reasonable.

### **C. The Relationship between the TMNSR Procurement Revision and the Generator Audit Revisions**

On November 6, 2012, the Joint Parties filed revisions to the Tariff to enhance the auditing requirements for generation resources.<sup>30</sup> Those revisions included substantial changes to the requirements for auditing the capability of resources that provide TMNSR, including revisions to better capture the historical performance of the resource in the audit value of the resource (*i.e.*, the value that captures the 10-minute capability of the resource). The ISO anticipates that as the new audit program is implemented in 2013, and as the historical performance value of resources is factored into their 10-minute capability values over time, those values (and hence the amount of Forward Reserve

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<sup>28</sup> *Id.* at pp. 6-7.

<sup>29</sup> *Id.*

<sup>30</sup> *ISO New England Inc. and New England Power Pool, Market Rule 1 Revisions Relating to Auditing of Generation Resources*, Docket No. ER13-323-000 (filed Nov. 6, 2012).

Obligation that a participant is able to assign to a resource) will better reflect the true performance capability of the resource. This should reduce the circumstances under which the ISO will utilize the provision that is being put into place via the TMNSR Procurement Revision, since there should be convergence between the historical performance of reserve resources and the reserve capability values of resources used for meeting Forward Reserve Obligations. Nevertheless, the Filing Parties believe it is appropriate to implement the TMNSR Procurement Revision at this time in order to help ensure the availability of appropriate reserve in the interim period.

## **VI. STAKEHOLDER PROCESS.**

At its October 10-11, 2012 meeting, the NEPOOL Markets Committee recommended that the NEPOOL Participants Committee support the TMNSR Procurement Revision, with a vote of 74.74% in favor, with oppositions and abstentions recorded.<sup>31</sup> At its November 2, 2012 meeting the Participants Committee voted to support the TMNSR Procurement Revision as part of its Consent Agenda, with oppositions and abstentions noted.<sup>32</sup>

## **VII. ADDITIONAL SUPPORTING INFORMATION**

Section 35.13 of the Commission's regulations generally requires public utilities to file certain cost and other information related to an examination of traditional cost-of-service rates. However, the TMNSR Procurement Revision does not modify a traditional "rate" and the ISO is not a traditional investor-owned utility. Therefore, to the extent necessary, the Filing Parties request waiver of Section 35.13 of the Commission's

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<sup>31</sup> The individual Sector votes were Generation (17.1% in favor, 0% opposed, 3 abstentions), Transmission (12.83% in favor, 4.27% opposed), Supplier (13.3% in favor, 3.8% opposed, 5 abstentions), Alternative Resources (14.42% in favor, 0.08% opposed, 4 abstentions), Publicly Owned Entity (0% in favor, 17.1% opposed, 1 abstention), and End User (17.1% in favor, 0% opposed, 3 abstentions).

<sup>32</sup> The Consent Agenda for a Participants Committee meeting, similar to the Consent Agenda for a Commission open meeting, is a group of actions (each recommended by a Technical Committee or subgroup established by the Participants Committee) to be taken by the Participants Committee through approval of a single motion at a meeting. All recommendations voted on as part of the Consent Agenda are deemed to have been voted on individually and independently. In this case, the Participants Committee's approval of the November 2, 2012 Consent Agenda included its support for the TMNSR Procurement Revision. However, all oppositions and abstentions recorded on this Consent Agenda were specifically attributed the TMNSR Procurement Revision, including the following: oppositions by Energy America, Hess Corporation, Integrys Energy Services and Mass. Municipal Wholesale Electric Co. (MMWEC) and each of MMWEC's Participant members that it represented; and abstentions by Braintree Electric Light Department, Hingham Municipal Lighting Plant, Pascoag Utility District, CT Office of Consumer Counsel, ME Public Advocate Office and NH Office of Consumer Advocate.

regulations.<sup>33</sup> Notwithstanding its request for waiver, the Filing Parties submit the following additional information in substantial compliance with relevant provisions of Section 35.13 of the Commission's regulations:

35.13(b)(1) – Materials included herewith are as follows:

- This transmittal letter;
- Blacklined ISO Tariff sections reflecting the revision submitted in this filing;
- Clean ISO Tariff sections reflecting the revision submitted in this filing;
- Testimony of Christopher A. Parent (the “Parent Testimony”), sponsored solely by the ISO; and
- List of governors and utility regulatory agencies in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont to which a copy of this filing has been sent.

35.13(b)(2) – As set forth in Section II above, the Filing Parties request that the revision become effective on March 1, 2013.

35.13(b)(3) – Pursuant to Section 17.11(e) of the Participants Agreement, Governance Participants are being served electronically rather than by paper copy. The names and addresses of the Governance Participants are posted on the ISO's website at [http://www.iso-ne.com/committees/nepool\\_part/index.html](http://www.iso-ne.com/committees/nepool_part/index.html). A copy of this transmittal letter and the accompanying materials have also been sent to the governors and electric utility regulatory agencies for the six New England states that comprise the New England Control Area, the New England Conference of Public Utility Commissioners, Inc., and to the New England States Committee on Electricity. Their names and addresses are shown in the attached listing. In accordance with Commission rules and practice, there is no need for the Governance Participants or the entities identified in the listing to be included on the Commission's official service list in the captioned proceeding unless such entities become intervenors in this proceeding.

35.13(b)(4) – A description of the materials submitted pursuant to this filing is contained in Section VII of this transmittal letter.

35.13(b)(5) – The reasons for this filing are discussed in Section V of this transmittal letter.

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<sup>33</sup> 18 C.F.R. § 35.13 (2011).

35.13(b)(6) – The ISO’s approval of the change is evidenced by this filing. The change reflects the results of the Participant Processes required by the Participants Agreement and reflect the support of the Participants Committee.

35.13(b)(7) – Neither the ISO nor NEPOOL has knowledge of any relevant expenses or costs of service that have been alleged or judged in any administrative or judicial proceeding to be illegal, duplicative, or unnecessary costs that are demonstrably the product of discriminatory employment practices.

35.13(b)(8) – A form of notice and electronic media are no longer required for filings in light of the Commission’s Combined Notice of Filings notice methodology.

35.13(c)(1) – The market rule change herein does not modify a traditional “rate,” and the statement required under this Commission regulation is not applicable to the instant filing.

35.13(c)(2) – The ISO does not provide services under other rate schedules that are similar to the wholesale, resale and transmission services it provides under the Tariff.

35.13(c)(3) - No specifically assignable facilities have been or will be installed or modified in connection with the revision filed herein.

## **VIII. CONCLUSION**

As explained herein, the TMNSR Procurement Revision permits the procurement of additional Ten-Minute Non-Spinning Reserve in the Forward Reserve Market, which will help ensure the availability of sufficient reserves in real-time in cases where historical analysis indicates that reserve resources are underperforming or where the ISO anticipates that additional TMNSR will be relied upon in real-time to satisfy the forecasted first contingency supply loss. For these reasons, as more fully explained in this transmittal letter, the TMNSR Procurement Revision is just and reasonable. Accordingly, the Filing Parties request that the Commission accept this filing with the revision to become effective on March 1, 2013.

Respectfully submitted,

The Honorable Kimberly D. Bose  
November 27, 2012  
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**ISO NEW ENGLAND INC.**

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**NEW ENGLAND POWER POOL  
PARTICIPANTS COMMITTEE**

By: /s/\_\_\_\_\_

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### **III.9 Forward Reserve Market**

The Forward Reserve Market is a market to procure TMNSR and TMOR on a forward basis to satisfy forward TMNSR and TMOR requirements.

#### **III.9.1 Forward Reserve Market Timing.**

A Forward Reserve Auction will be held approximately two months in advance of each Forward Reserve Procurement Period. The Forward Reserve Auction input parameters and assumptions will be evaluated, published and reviewed with Market Participants prior to the Forward Reserve Auction.

The Forward Reserve Procurement Periods shall be the Winter Capability Period (October 1 through May 31) or the Summer Capability Period (June 1 through September 30), as applicable.

The Forward Reserve Delivery Period shall be hour ending 0800 through hour ending 2300 for each weekday of the Forward Reserve Procurement Period excluding those weekdays that are defined as NERC holidays.

#### **III.9.2 Forward Reserve Market Reserve Requirements.**

The ISO shall conduct an advance purchase of capability to satisfy the expected Forward Reserve requirements for the system and each Reserve Zone as calculated by the ISO in accordance with the following procedures and as specified more fully in the ISO New England Manuals. The Forward Reserve Market reserve requirements will be specified as part of the Forward Reserve Auction parameters and will be published and reviewed with Market Participants prior to each Forward Reserve Auction.

##### **III.9.2.1 Forward Reserve Market ~~Minimum~~ Reserve Requirements.**

The Forward Reserve Market ~~minimum~~ requirements for the New England Control Area will be based on the forecast of the first and second contingency supply losses for the next Forward Reserve Procurement Period and will consist of the following:

- ~~(i)~~ ~~(i)~~—One half of the forecasted first contingency supply loss will be specified as the minimum TMNSR to be purchased,
- (ii) An additional amount of TMNSR will be added to the minimum TMNSR if system conditions forecasted for the Forward Reserve Procurement Period indicate that the TMNSR available during the period would otherwise be insufficient to meet Real-Time Operating Reserve requirements. The additional amount of TMNSR shall be calculated to account for: (a) any historical under-performance of Resources dispatched in response to a system contingency and

(b) the likelihood that more than one half of the forecasted first contingency supply loss will be satisfied using TMNSR.

(ii) One half of the second contingency supply loss will be specified as the minimum TMOR to be purchased,

~~(iii)~~ (iv) An amount of Replacement Reserve in the form of incremental TMOR will be specified in accordance with the Real-Time Replacement Reserve requirement as described in ISO New England Operating Procedure No. 8, Operating Reserve and Regulation and will be added to the minimum TMOR to be purchased.

The ~~minimum~~ requirements specified above, further adjusted to respect the additional provisions described in Section III.9.2.2, represent the set of requirements that will be input into the Forward Reserve Auction.

### **III.9.2.2 Locational Reserve Requirements for Reserve Zones**

Locational reserve requirements will be established for each Reserve Zone. The locational reserve requirements will reflect the need for 30-minute contingency response to provide 2nd contingency protection for each import constrained Reserve Zone. The locational reserve requirements can be satisfied only by Resources that are located within a Reserve Zone and that are capable of providing 30-minute or higher quality reserve products.

The ISO shall establish the locational reserve requirements based on a rolling, two-year historical analysis of the daily peak hour operational requirements for each Reserve Zone for like Forward Reserve Procurement Periods. The ISO will commence the analysis on February 1 or the first business day thereafter for the subsequent summer Forward Reserve Procurement Period and on June 1 or the first business day thereafter for the subsequent winter Forward Reserve Procurement Period.

These daily peak hour requirements will be aggregated into daily peak hour frequency distribution curves and the MW value at the 95th percentile of the frequency distribution curve for each Reserve Zone will establish the locational requirement.

In the event of a change in the configuration of the transmission system or the addition, deactivation or retirement of a major generating Resource or Dispatchable Asset Related Demand, the rolling two-year



historical analysis will be calculated in a manner that reflects the change in configuration of the transmission system or the addition, deactivation or retirement of a major generating Resource or Dispatchable Asset Related Demand as of the commencement date of the analysis provided that the following conditions are met:

(a) Change in Configuration of the Transmission System

Any change in the configuration of the transmission system must have been placed in service and released for dispatch on or before December 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent summer Forward Reserve Procurement Period or on or before April 30 for inclusion in the analysis for setting the locational reserve requirements for the subsequent winter Forward Reserve Procurement Period.

If the change in the configuration of the transmission system consists of a new facility or upgrade of an existing facility, the facility must have operated at an availability level of at least 95% for the period beginning with its in service date and ending on January 31 prior to the summer Forward Reserve Procurement Period or ending on May 31 prior to the winter Forward Reserve Procurement Period.

(b) Addition, Deactivation or Retirement of a Major Generating Resource or Dispatchable Asset Related Demand

For the addition of a new generating Resource, the Resource must be placed in service and released for dispatch on or before December 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent summer Forward Reserve Procurement Period or on or before April 30 for inclusion in the analysis for setting the locational reserve requirements for the subsequent winter Forward Reserve Procurement Period. For the deactivation or retirement of a generating Resource or Dispatchable Asset Related Demand, the Resource must have been removed from service on or before January 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent summer Forward Reserve Procurement Period or on or before May 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent winter Forward Reserve Procurement Period.

The modified historical data set will be composed of actual data used in the operation of the reconfigured system and historical (pre-reconfiguration) data adjusted for the impact of the system reconfiguration.

Pre-reconfiguration data will be revised by substituting values from the historical data set that are no longer valid with corresponding values used in the operation of the reconfigured system.

The locational reserve requirements will be recalculated using the modified historical data set until the rolling two-year historical data set reflects a common system configuration.

### **III.9.3 Forward Reserve Auction Offers.**

Forward Reserve Auction Offers for TMNSR and TMOR shall be (a) made on a \$/MW-month basis, (b) made on a Reserve Zone specific basis, (c) made on a non-Resource specific basis and (d) shall be less than or equal to the Forward Reserve Offer Cap. Forward Reserve Auction Offers shall be submitted to the ISO by Market Participants. The Market Participants are responsible for complying with the requirements of this Section III.9 if the Forward Reserve Auction Offer is accepted.

### **III.9.4 Forward Reserve Auction Clearing and Forward Reserve Clearing Prices.**

The Forward Reserve Auction shall simultaneously clear Forward Reserve Auction Offers to meet the Forward Reserve requirements for the system and each Reserve Zone using a mathematical programming algorithm. The objective of the mathematical programming based Forward Reserve Auction clearing is to minimize the total cost of Forward Reserve procured to meet the Forward Reserve requirements. The Forward Reserve Clearing Price for each Reserve Zone will reflect the cost to serve the next increment of reserve in that Reserve Zone based on the submitted offers. The Forward Reserve Auction algorithm substitutes higher quality TMNSR for lower quality TMOR to meet system or Reserve Zone TMOR requirements when it is economical to do so provided that no constraints are violated.

The Forward Reserve Auction algorithm shall also utilize excess Forward Reserve in one Reserve Zone to meet the Forward Reserve requirements of another Reserve Zone or the system provided that the Forward Reserve can be delivered such that no constraints are violated. In addition, the Forward Reserve Auction shall apply price cascading such that the Forward Reserve Clearing Price for TMOR in a Reserve Zone is always less than or equal to the Forward Reserve Clearing Price for TMNSR in that Reserve Zone. If there is insufficient supply to meet the Forward Reserve requirements for a Reserve Zone, the Forward Reserve Clearing Price for that Reserve Zone will be set to the Forward Reserve Offer Cap.

#### **III.9.4.1 Forward Reserve Clearing Price and Forward Reserve Obligation Publication and Correction.**

Market Participants with cleared Forward Reserve Auction Offers will receive a Forward Reserve Obligation for each Reserve Zone, as applicable, that is equal to the amount of Forward Reserve megawatts cleared for that Market Participant adjusted for internal bilateral transactions that transfer Forward Reserve Obligations.

(a) Within five business days after the close of the Forward Reserve Auctions, the ISO shall post Forward Reserve Clearing Prices and Forward Reserve Obligations, which shall be final as posted, not subject to correction or other adjustment, and used for the purposes of settlement, except as provided in subsections (c) and (d). The permissibility of correction of errors in sections of Market Rule 1 relating to settlement and billing processes shall not apply to Forward Reserve Clearing Prices and Forward Reserve Obligations deemed final pursuant to this Section III.9.4.1.

(b) Before posting the final Forward Reserve Clearing Prices and Forward Reserve Obligations, the ISO shall make a good faith effort when clearing those markets to discover and correct any errors that may occur due to database, software or similar errors of the ISO or its systems before publishing the final prices awarded.

(c) If the ISO determines based on reasonable belief that there may be one or more errors in the final Forward Reserve Clearing Prices and Forward Reserve Obligations or if no Forward Reserve Clearing Prices and Forward Reserve Obligations are available due to human error, database, software or similar errors of the ISO or its systems, the ISO shall post on the ISO website prior to 11:59 p.m. of the third business day following the posting deadline specified in subsection (a), a notice that the Forward Reserve Clearing Prices and Forward Reserve Obligations are provisional and subject to correction or unavailable for initial publishing. The ISO shall confirm within three business days of posting a notice pursuant to this subsection whether there was an error in the Forward Reserve Clearing Prices and Forward Reserve Obligations and shall post a notice stating its findings.

(d) Within three business days after posting an initial notice pursuant to subsection (c); the ISO shall either: (1) publish final or corrected Forward Reserve Clearing Prices and Forward Reserve Obligations, or: (2) in the event that the ISO is unable to calculate and post final or corrected Forward Reserve Clearing Prices and Forward Reserve Obligations due to exigent circumstances not contemplated in this market rule, make an emergency filing with the Commission detailing the exigent circumstance which will not allow final Forward Reserve Clearing Prices and Forward Reserve Obligations to be calculated and posted, along with a proposed resolution including a timeline to post final prices.

### **III.9.5**

#### **Forward Reserve Resources**

##### **III.9.5.1**

##### **Assignment of Forward Reserve MWs to Forward Reserve Resources.**

(a) Prior to the close of the Re-Offer Period for each Operating Day of the Forward Reserve Procurement Period, Market Participants must convert their Forward Reserve Obligations into Resource-specific obligations by assigning Forward Reserve MWs to specific eligible Forward Reserve Resources, in accordance with procedures set forth in the ISO New England Manuals. The assignment of Forward Reserve MWs to a Forward Reserve Resource must be performed by the Lead Market Participant for the Resource.

(b) A Market Participant with a Forward Reserve Obligation must have an Ownership Share in a Forward Reserve Resource, in order to assign Forward Reserve MWs to that Forward Reserve Resource to fulfill that Market Participant's Forward Reserve Obligation. If more than one Market Participant has an Ownership Share in a Forward Reserve Resource, the Forward Reserve MWs assigned to that Resource will be allocated pro-rata to Market Participants by Ownership Share.

##### **III.9.5.2**

##### **Forward Reserve Resource Eligibility Requirements.**

(a) Forward Reserve Resources are off-line or on-line Resources that have been assigned by Market Participants to meet their Forward Reserve Obligations. To be eligible as a Forward Reserve Resource, a Resource must satisfy the following criteria:

(i) If the Resource is off-line, it must be a Fast Start Generator and have an audited CLAIM10 or CLAIM30 value established pursuant to Section III.9.5.3;

(ii) If the Resource is expected to be on-line during a Forward Reserve Delivery Period, it must be able to produce the energy equivalent to its assigned Forward Reserve Obligation within the timeframe of the assigned Forward Reserve Obligation when operating within its dispatch range;

(iii) If the Resource is an Asset Related Demand, it must have an audited CLAIM10 or CLAIM30 value established pursuant to Section III.9.5.3;

(iv) The Resource may have a Capacity Supply Obligation for all, some, or none of its applicable Seasonal Claimed Capability. Any portion of the Resource to which a Forward

Reserve Obligation has been assigned that is without a Capacity Supply Obligation must not have been offered to support an External Transaction sale during the Operating Day for which it has been assigned;

(v) The Resource must have Electronic Dispatch Capability;

(vi) The Resource must follow ISO dispatch instructions during the Operating Day. The Resource must meet the technical requirements associated with the provision of Forward Reserve as specified in ISO New England Operating Procedure No. 14, Technical Requirements For Generation, Dispatchable and Interruptible Loads;

(vii) The portion of the Resource, with or without a Capacity Supply Obligation, that is assigned a Forward Reserve Obligation for any portion of an Operating Day must be eligible to provide Operating Reserve in accordance with the provisions of Section III.10.1.1;

(viii) The portion of the Resource without a Capacity Supply Obligation to which a Forward Reserve Obligation has been assigned must be offered into the Real-Time Energy Market in accordance with the provisions of III.13.6.1.1.2.

(b) If a Resource's audited CLAIM10 or CLAIM30 values have not been audited or tested pursuant to Section III.9.5.3 or Section III.9.5.4 at least once during any Forward Reserve Procurement Period, then the Resource's audited CLAIM10 or CLAIM30 values will be set to zero at the beginning of the succeeding Forward Reserve Procurement Period until new audited CLAIM10 or CLAIM30 values are established pursuant to Section III.9.5.3. At least 30 calendar days prior to the beginning of the next Forward Reserve Procurement Period, the ISO will notify Lead Market Participants or Designated Entities of any Resources that have not been audited or tested pursuant to Section III.9.5.3 or Section III.9.5.4 during the currently-effective Forward Reserve Procurement Period.

(c) External Resources will be permitted to participate in the Forward Reserve Market when the respective Control Areas implement the technology and processes necessary to support recognition of Operating Reserves from external Resources.

### **III.9.5.3 Establishment of Audited CLAIM10 and CLAIM30 Values.**

A Lead Market Participant or Designated Entity may establish an audited CLAIM10 or CLAIM30 value for a Resource by requesting either a formal audit or an economic dispatch audit. An audit request must specify the type of audit that is being requested and the target performance level that the Resource will be tested against.

In the case of a formal audit:

1. The ISO will initiate the audit by issuing Dispatch Instructions without providing prior notice to the Lead Market Participant or Designated Entity.
2. There is no compensation for any costs associated with operating a Resource out of economic merit during the audit.
3. The ISO will normally perform the audit within three business days of receipt of the audit request and will advise the Lead Market Participant or Designated Entity if it will be unable to initiate the audit during the three business day period.

In the case of an economic dispatch audit:

1. The audit is initiated when a Resource is dispatched in economic merit following receipt of the audit request.

A Resource passes an audit if its demonstrated performance level is greater than or equal to its target performance level multiplied by 0.9.

In the case of a successful audit, the Resource's audited CLAIM10 or CLAIM30 values are set equal to the target performance level to be effective as of the 0001 hours of second business day following the day on which the audit was conducted.

In the case of an unsuccessful audit:

1. If the Resource had a prior audited CLAIM10 or CLAIM30 value of zero, then the audited CLAIM10 or CLAIM30 value will be set equal to the actual performance level

demonstrated during the audit effective as of the second business day following the day on which the audit was conducted.

2. If the Resource had a prior audited CLAIM10 or CLAIM30 value greater than zero, then:
  - a) the audited CLAIM10 or CLAIM30 value will not be adjusted to reflect the results of the audit;
  - b) In the event of a formal audit, the existing record of performance-based testing and adjustment pursuant to Section III.9.5.4 will not be modified to reflect a test failure; and
  - c) In the event of an economic dispatch audit, the existing record of performance-based testing and adjustment pursuant to Section III.9.5.4 will be modified to reflect a test failure.

Except that the Lead Market Participant or Designated Entity may elect, within two business days following the day on which the audit was conducted, to direct the ISO to set the Resource's audited CLAIM10 or CLAIM30 values equal to the performance level demonstrated during the audit, which adjustment will become effective at 0001 hours on the fifth business day following the day on which the audit was conducted and in which case the record of any failures of performance-based testing pursuant to Section III.9.5.4 will be re-set to zero failures.

#### **III.9.5.4 Performance-Based Testing and Adjustment of CLAIM10 and CLAIM30 Values.**

A Resource's audited CLAIM10 and CLAIM30 values are subject to performance-based testing and adjustment during each instance in which the Resource is issued a Dispatch Instruction (except for a Dispatch Instruction associated with a formal audit pursuant to Section III.9.5.3), including any Dispatch Instruction associated with a request for an economic dispatch audit as provided in Section III.9.5.3. In the case of a performance-based test, the demonstrated performance of the Resource is compared to the target performance level, which is the lesser of the Resource's audited CLAIM10 or CLAIM30 value or the desired output level specified by the Dispatch Instruction.

A Resource passes a performance-based test if its demonstrated performance level is greater than or equal to its target performance level multiplied by 0.9.

If a Resource fails to pass a performance-based test, then the Resource's audited CLAIM10 or CLAIM30 values will be adjusted as follows (with the Resource's audited CLAIM10 or CLAIM30 value as determined pursuant to Section III.9.5.3 continuing to be used for reference purposes):

First failure – CLAIM10 or CLAIM30 value is not adjusted.

Second failure – adjusted CLAIM10 or CLAIM30 value is set equal to 0.75 multiplied by the Resource's audited CLAIM10 or CLAIM30 value.

Third failure – adjusted CLAIM10 or CLAIM30 value is set equal to 0.50 multiplied by the Resource's audited CLAIM10 or CLAIM30 value.

Fourth failure – adjusted CLAIM10 or CLAIM30 value is set equal to 0.25 multiplied by the Resource's audited CLAIM10 or CLAIM30 value.

Fifth failure – adjusted CLAIM10 or CLAIM30 value is set equal to zero.

One or more failures followed by ten consecutive passes – adjusted CLAIM10 or CLAIM30 value is re-set equal to the last audited CLAIM10 or CLAIM30 value determined pursuant to Section III.9.5.3 and the record of performance-based test failures is set equal to zero effective as of 0001 hours of the second business day following the date on which the performance-based test was conducted.

Any adjustments resulting from a failed performance-based test, except for adjustments associated with ten consecutive passes, will become effective as of 0001 hours of the fifth business day following the day on which the test was conducted.

If an audited CLAIM10 or CLAIM30 value has been adjusted as the result of a performance-based test failure, a Lead Market Participant or Designated Entity may seek to re-establish a new, audited CLAIM10 or CLAIM30 value in accordance with Section III.9.5.3.

## **III.9.6 Delivery of Reserve.**

### **III.9.6.1 Dispatch and Energy Bidding of Reserve.**



Forward Reserve shall be delivered by Forward Reserve Resources by offering the capability into the Real-Time Energy Market by submitting Supply Offers and Demand Bids, prior to the close of the Re-Offer Period, at or above the Forward Reserve Threshold Price for the Operating Day. Day-Ahead Energy Market Supply Offers and Demand Bids for Resources to which Forward Reserve Obligations have been assigned will be used in the Real-Time Energy Market for the associated Operating Day even if the Supply Offers do not clear the Day-Ahead Energy Market, notwithstanding the requirements of Market Rule 1 Section III.13.6.2.1.1.2, unless superseded by a more recent Supply Offer or Demand Bid submitted prior to the close of the Re-Offer Period. A Market Participant is not required to submit a Supply Offer or Demand Bid into the Day-Ahead Energy Market for a Resource without a Capacity Supply Obligation in order for the Resource to be eligible to be a Forward Reserve Resource. The Forward Reserve Threshold Prices shall be set in accordance with the ISO New England Manuals so that Forward Reserve Resource capability has (a) a low probability of being dispatched for energy and (b) a high probability of being held for reserve purposes.

Forward Reserve Resources are scheduled and operated in accordance with Section III.1 of Market Rule 1; no distinction is made due to their status as Forward Reserve Resources. Forward Reserve Resources are eligible to set the Locational Marginal Price in accordance with Section III.2 of Market Rule 1.

### **III.9.6.2 Forward Reserve Threshold Prices.**

The formula for determining the Forward Reserve Threshold Prices shall be fixed for the duration of the Forward Reserve Procurement Period. The ISO will reevaluate the Forward Reserve Threshold Price level for successive Forward Reserve Auctions on the basis of experience, expected operating conditions and other relevant information.

**Forward Reserve Threshold Price:** is calculated as the Forward Reserve Heat Rate multiplied by the daily Forward Reserve Fuel Index.

**Forward Reserve Heat Rate:** shall be fixed for the duration of the Forward Reserve Procurement Period and announced in the announcement for the Forward Reserve Auction. New Forward Reserve Heat Rates shall be specified for successive auctions, and shall be the lesser of: (a) the value determined in accordance with applicable ISO New England Manuals; or (b) the heat rate defined for the PER Proxy Unit in Section III.13.7.2.7.1.1.1(b) less 1 Btu/kWh.

**Forward Reserve Fuel Index:** is a daily fuel index, or combination of daily indices, applicable to the New England Control Area and specified in the announcement of the Forward Reserve Auction.

### III.9.6.3 Monitoring of Forward Reserve Resources.

In accordance with Section III.A.9.4 of *Appendix A* of this Market Rule 1, the Internal Market Monitor will receive information that will identify Forward Reserve Resources, the Forward Reserve Threshold Price, and the assigned Forward Reserve Obligation. Prior to mitigation of Supply Offers or Demand Bids associated with a Forward Reserve Resource, the Internal Market Monitor shall consult with the Participant in accordance with Market Rule 1, *Appendix A*, Section III.A.3. The Internal Market Monitor and the Market Participant shall consider the impact on meeting any Forward Reserve Obligations in those consultations. If mitigation is imposed, any mitigated offers shall be used in the calculation of qualifying megawatts under Section III.9.6.4.

### III.9.6.4 Forward Reserve Qualifying Megawatts.

Qualifying megawatts are calculated separately on an hourly basis for Forward Reserve Resources supplying Forward Reserve from an off-line state and Forward Reserve Resources supplying Forward Reserve from an on-line state as follows:

**Off-line qualifying megawatts.** Off-line qualifying megawatts are the amount of capability equal to or below the Economic Maximum Limit for an off-line Forward Reserve Resource offered at or above the Forward Reserve Threshold Price. The generating Resource must satisfy this requirement in the Real-Time Energy Market. In the case of off-line Forward Reserve Resources, the calculation for Forward Reserve Qualifying Megawatts shall include both the energy Supply Offer and a pro-rated amount of Start-Up Fees and No-Load Fees as defined below.

An off-line Forward Reserve Resource must offer its capability so that the following holds:

$$\frac{\textit{StartUp}}{\textit{EcoMax} \times 1 \textit{ hour}} + \frac{\textit{NoLoad}}{\textit{EcoMax}} + \textit{Energy Offer}_i \geq \textit{ForwardReserveThresholdPrice}$$

where:

*StartUp* = the generating Resource's cold Start-Up Fee.

*NoLoad* = the generating Resource's No-Load Fee.

*EnergyOffer<sub>i</sub>* = the generating Resource's Energy Offer for Energy Offer block *i*.

*EcoMax*

= the Economic Maximum Limit.

**On-line qualifying megawatts**: is the capability that is less than or equal to the Economic Maximum Limit and above the Economic Minimum Limit that is offered at or above the applicable Forward Reserve Threshold Price by an on-line generating Resource or, is the capability that is less than or equal to the Maximum Consumption Limit and greater than the Minimum Consumption Limit offered at or above the applicable Forward Reserve Threshold Price by a Dispatchable Asset Related Demand Resource. The Forward Reserve Resource must satisfy this requirement in the Real-Time Energy Market. For an on-line generating Resource that has been assigned to meet a Forward Reserve Obligation and has not cleared in the Day-Ahead Energy Market and is operating in a delivery hour as the result of an ISO commitment for VAR or local second contingency protection, the on-line qualifying megawatts shall be zero.

### **III.9.6.5 Delivery Accounting.**

Forward Reserve Delivered Megawatts are the quantity of Forward Reserve delivered in each hour of the Real-Time Energy Market to each Reserve Zone and is calculated as follows.

- (a) Forward Reserve Delivered Megawatts for an off-line Forward Reserve Resource are calculated in megawatts for each hour of the Real-Time Energy Market for each Reserve Zone as the minimum of:
  - (i) the amount, in MW, of Forward Reserve that the off-line generating Resource can provide, based upon CLAIM10 and CLAIM30 values provided in the generating Resource's Real-Time Supply Offer,
  - (ii) Forward Reserve Assigned Megawatts, or
  - (iii) Forward Reserve Qualifying Megawatts for that Resource (energy at or above the applicable Forward Reserve Threshold Price per Section III.9.6.2), less any previously accounted for Forward Reserve Delivered Megawatts for that Resource.
  
- (b) Forward Reserve Delivered Megawatts for an on-line generating Resource are calculated in megawatts for each hour for each Reserve Zone as the minimum of:
  - (i) 10 or 30 times the MW/minute ramping rate of the on-line generating Resource, as applicable,

(ii) Forward Reserve Assigned Megawatts, or

(iii) Forward Reserve Qualifying Megawatts for that Resource (MW offered at or above the applicable Forward Reserve Threshold Price per Section III.9.6.2)

less any previously accounted for Forward Reserve Delivered Megawatts for that Resource.

(c) Forward Reserve Delivered Megawatts for a Dispatchable Asset Related Demand are calculated in megawatts for each hour of the Real-Time Energy Market for each Reserve Zone as the minimum of:

(i) 10 or 30 times the MW/minute ramp rate of the Resource, as applicable,

(ii) the amount of Forward Reserve capability specified in the Resource's CLAIM10 and CLAIM30 values,

(iii) Forward Reserve Assigned Megawatts, or

(iv) Forward Reserve Qualifying Megawatts for that Resource (MW offered at or above the applicable Forward Reserve Threshold Price per Section III.9.6.2),

less any previously accounted for Forward Reserve Delivered Megawatts for that Resource.

(d) A Forward Reserve Resource's hourly Forward Reserve Delivered Megawatts for each Reserve Zone is calculated as the sum of the Market Participant's Resource specific hourly Forward Reserve Delivered Megawatts for each Reserve Zone.

(e) Resource specific Forward Reserve Delivered Megawatts for TMNSR within a Reserve Zone will be applied first to a Market Participant's higher value Forward Reserve Obligation for TMNSR in that Reserve Zone. Any surplus Forward Reserve Delivered Megawatts for TMNSR in that Reserve Zone will be applied to meet the Market Participant's Forward Reserve Obligation for TMOR in that Reserve Zone. Forward Reserve Delivered Megawatts remaining within that Reserve Zone after the Market Participant's Forward Reserve Obligation for that Reserve Zone have been met is available to be applied to the Market Participant's Forward Reserve Obligations in other Reserve Zones provided that the Forward Reserve Delivered Megawatts can be delivered to the other Reserve Zones.

### **III.9.7 Consequences of Delivery Failure.**

#### **III.9.7.1 Real-Time Failure-to-Reserve.**

A Real-Time Forward Reserve Failure-to-Reserve occurs when a Market Participant's Forward Reserve Delivered Megawatts for a Reserve Zone in an hour is less than that Market Participant's Forward Reserve Obligation for that Reserve Zone in that hour. Under these circumstances the Market Participant pays a penalty based upon the Forward Reserve Failure-to-Reserve Penalty Rate and that Market Participant's Forward Reserve Failure-to-Reserve Megawatts.

(a) Forward Reserve Failure-to-Reserve Megawatts: A Market Participant's Forward Reserve Failure-to-Reserve Megawatts for TMNSR for a Reserve Zone is defined as, for each hour, the amount that is the maximum of the following values:

- (i) Market Participant Forward Reserve Obligation for TMNSR for that Reserve Zone minus the Market Participant's Forward Reserve Delivered Megawatts for TMNSR for that Reserve Zone; and
- (ii) Zero.

A Market Participant's Forward Reserve Failure-to-Reserve Megawatts for TMOR for a Reserve Zone is defined as, for each hour, the amount that is the maximum of the following values:

- (i) Market Participant Forward Reserve Obligation for TMOR for that Reserve Zone minus Market Participant's Forward Reserve Delivered Megawatts for TMOR for that Reserve Zone; and
- (ii) Zero.

(b) Forward Reserve Failure-to-Reserve Penalties: A Market Participant's Forward Reserve Failure-to-Reserve Penalty for a Reserve Zone in an hour is defined as:

(i) Forward Reserve Failure-to-Reserve Penalty for TMNSR = Forward Reserve Failure-to-Reserve Penalty Rate multiplied by the Forward Reserve Failure-to-Reserve Megawatts for TMNSR; and

(ii) Forward Reserve Failure-to-Reserve Penalty for TMOR = Forward Reserve Failure-to-Reserve Penalty Rate multiplied by the Forward Reserve Failure-to-Reserve Megawatts for TMOR;

Where:

Forward Reserve Failure-to-Reserve Penalty Rate = 1.5 multiplied by the Forward Reserve Payment Rate

### **III.9.7.2 Failure-to-Activate Penalties.**

Market Participants are required to pay a Forward Reserve Failure-to-Activate Penalty for each Forward Reserve Resource that fails to activate its Forward Reserve capability when requested to do so by the ISO as part of the real-time contingency dispatch algorithm.

When a Market Participant's Forward Reserve Resource has been determined by the ISO to have failed to activate Forward Reserve, which determination shall be made in accordance with the ISO New England Manuals, that Market Participant shall be required to pay a Forward Reserve Failure-to-Activate Penalty associated with that Resource as follows:

(a) **Forward Reserve Failure-to-Activate Megawatts:**

A Market Participant's Forward Reserve Failure-to-Activate Megawatts for TMNSR for a Resource is defined as, for each hour, the amount that is the lesser of the following values:

(i) Maximum of Forward Reserve Delivered Megawatts for TMNSR minus actual amount of TMNSR energy delivered during activation, or zero;

(ii) Maximum of Target Activation Megawatts for TMNSR minus actual amount of TMNSR energy delivered during activation, or zero;

Where:

Target Activation Megawatts for TMNSR is the target MW output issued by the ISO in a Dispatch Instruction for that Resource in response to a need to activate TMNSR.

A Market Participant's Forward Reserve Failure-to-Activate Megawatts for TMOR for a Resource is defined as, for each hour, the amount that is the lesser of the following values:

(i) Maximum of Forward Reserve Delivered Megawatts for TMOR plus Forward Reserve Delivered Megawatts for TMNSR minus Forward Reserve Failure-to-Activate Megawatts for TMNSR minus actual amount of TMOR energy delivered during activation, or zero;

(ii) Maximum of Target Activation Megawatts for TMOR minus Forward Reserve Failure-to-Activate Megawatts for TMNSR minus actual amount of TMOR energy delivered during activation, or zero;

Where:

Target Activation Megawatts for TMOR is the target MW output issued by the ISO in a Dispatch Instruction for that Resource in response to a need to activate TMOR.

**(b) Forward Reserve Failure-to-Activate Penalties:**

A Market Participant's Forward Reserve Failure-to-Activate Penalty for a Resource in an hour is defined as:

(i) Forward Reserve Failure-to-Activate Penalty for TMNSR = The sum of the Forward Reserve Payment Rate for TMNSR and the Forward Reserve Failure-to-Activate Penalty Rate multiplied by the Forward Reserve Failure-to-Activate Megawatts for TMNSR; and

(ii) Forward Reserve Failure-to-Activate Penalty for TMOR = The sum of the Forward Reserve Payment Rate for TMOR and the Forward Reserve Failure-to-Activate Penalty Rate multiplied by the Forward Reserve Failure-to-Activate Megawatts for TMOR;

Where:

Forward Reserve Failure-to-Activate Penalty Rate = Maximum of 2.25 multiplied by the Forward Reserve Payment Rate, or the applicable nodal LMP.

(c) A Forward Reserve Resource that is a Fast Start Generator that fails to activate Forward Reserve through a failure to start shall have its Forward Reserve Delivered Megawatts set equal to zero in each subsequent hour in the applicable Forward Reserve Delivery Period until such time that the Market Participant notifies the ISO that the subject Forward Reserve Resource is capable of providing the Forward Reserve Delivered Megawatts.

### **III.9.7.3 Known Performance Limitations.**

The ISO may have reason to believe that a particular Forward Reserve Resource is frequently receiving, or may frequently receive, Forward Reserve payments for a portion or all of its capability that is not capable of activating the Forward Reserve Assigned Megawatts for TMNSR or the Forward Reserve Assigned Megawatts for TMOR. When the ISO believes there is such a limited Forward Reserve Resource, the ISO shall contact and confer with the affected Market Participant before taking any action.

(a) The ISO will, whenever practicable, contact the affected Market Participant of the Forward Reserve Resource to request an explanation of the relevant resource Offer Data;

(b) If the explanation, if available, considered together with other information available to the ISO, indicates to the satisfaction of the ISO that the questioned Forward Reserve payments are consistent with Forward Reserve Resource capabilities, no further action will be taken; and

(c) If no agreement is reached, or an acceptable explanation is not provided, the Market Participant may request a Resource performance audit as specified in ISO New England Manuals. If the Forward Reserve Resource fails the performance audit or the Market Participant refuses to request a Resource performance audit, the ISO may take remedial action. Remedial actions may include, but are not limited to: (i) redeclaration, by the ISO, of any relevant operational Offer Data parameter, or (ii) removing the asset or the relevant portion of the asset's capability to provide Forward Reserve on a going-forward basis.

### **III.9.8 Forward Reserve Credits.**



Payment for Forward Reserve is based upon a Market Participant's Final Forward Reserve Obligation and the applicable Forward Reserve Clearing Prices. The ISO shall calculate these credits on an hourly basis for each Reserve Zone as follows:

(a) Final Forward Reserve Obligations for TMNSR and TMOR for each Market Participant are calculated for each Reserve Zone for each hour as follows:

(i) Final Forward Reserve Obligation = minimum [Forward Reserve Obligation, Forward Reserve Delivered Megawatts]

(b)  $FCACP_{Zone}$  and  $FRACP_{Zone}$  are defined as:

$FCACP_{Zone}$  for a Reserve Zone is the Forward Capacity Auction Capacity Clearing Price for the Capacity Zone in which the Reserve Zone is contained.

$FCACP_{Zone}$  for the Rest of System is the maximum Forward Capacity Auction Capacity Clearing Price for all Capacity Zones included in whole or in part in the Rest of System.

$FRACP_{Zone}$  is the Forward Reserve Clearing Price for the relevant Reserve Zone, for TMNSR or TMOR, respectively;

(c) Market Participant Forward Reserve Credit for TMNSR=Final Forward Reserve Obligation for TMNSR multiplied by the applicable hourly Forward Reserve Payment Rate for TMNSR;

where,

the hourly Forward Reserve Payment Rate for TMNSR is equal:

maximum of [(applicable monthly  $FRACP_{Zone}$  for TMNSR –  $FCACP_{Zone}$ ), 0] divided by the number of hours in the month associated with the Forward Reserve Delivery Period.

(d) Market Participant Forward Reserve Credit for TMOR =  
Final Forward Reserve Obligation for TMOR multiplied by  
the applicable hourly Forward Reserve Payment Rate for

TMOR; where,

the hourly Forward Reserve Payment Rate for TMOR is equal to:

maximum of [(applicable monthly FRACP<sub>Zone</sub> for TMOR - FCACP<sub>zone</sub>),0]  
divided by the number of hours in the month associated with the Forward  
Reserve Delivery Period.

### **III.9.9 Forward Reserve Charges.**

Forward Reserve Charges are allocated to each Market Participant in two steps. The first step allocates the Forward Reserve Credits associated with the procurement of reserves to meet the Forward Reserve requirement for the system. The second step, if necessary, allocates any remaining Forward Reserve Credits.

#### **III.9.9.1 Forward Reserve Credits Associated with System Reserve Requirement.**

The portion of Forward Reserve Credits associated with the procurement of the Forward Reserve requirement for the system is determined by simulating a Forward Reserve Auction using all submitted Forward Reserve Auction Offers to meet only the Forward Reserve Market minimum requirements for the New England Control Area pursuant to Section III.9.2.1. The simulated Forward Reserve Auction will clear offers pursuant to the methodology set forth in Section III.9.4 to calculate TMNSR and TMOR proxy system clearing prices. The TMNSR and TMOR proxy system clearing prices will reflect the cost to serve the next increment of reserve above the Forward Reserve Market minimum requirement for the New England Control Area.

For each hour, the total amount of Forward Reserve Credits associated with the procurement of the Forward Reserve requirement for the system is calculated as the lesser of:

- (i) The TMNSR Forward Reserve Market minimum requirement for the New England Control Area pursuant to Section III.9.2.1 multiplied by the maximum of the [TMNSR proxy system clearing price reduced by the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, 0], plus the TMOR Forward Reserve Market minimum requirement for the New England Control Area pursuant to Section III.9.2.1 multiplied by the maximum of the [TMOR proxy system clearing price reduced by the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, 0] and divided by the number of hours in the month associated with the Forward Reserve Delivery Period, or

- (ii) Total Forward Reserve Credits for the New England Control Area as calculated pursuant to Section III.9.8.

### **III.9.9.2 Adjusting Forward Reserve Credits for System Requirement.**

For each hour, the Forward Reserve Credits associated with the procurement of the Forward Reserve requirement for the system is reduced by:

- (i) Any Forward Reserve Failure-to-Reserve Penalty or Forward Reserve Failure-to-Activate Penalty that occurs in the Rest of System or in a Load Zone that is ineligible to receive an allocation of Forward Reserve Credits pursuant to Section III.9.9.4.1, and
- (ii) A prorated amount of any Forward Reserve Failure-to-Reserve Penalty or Forward Reserve Failure-to-Activate Penalty that occurs in a Load Zone that is eligible to receive an allocation of Forward Reserve Credits pursuant to Section III.9.9.4.1, where the prorated amount is calculated based on the ratio of Forward Reserve Credits calculated in Section III.9.9.1 to the total Forward Reserve Credits.

### **III.9.9.3 Allocating Forward Reserve Credits for System Requirements.**

For each hour, the Forward Reserve Credits associated with the procurement of the Forward Reserve requirements for the system as calculated pursuant to Section III.9.9.1, is reduced by any penalties calculated pursuant to Section III.9.9.2, and allocated on a pro rata basis using each Market Participant's share of Real-Time Load Obligation in each Load Zone (which includes the Market Participant's Real-Time Load Obligation associated with any Capacity Export Through Import Constrained Zone Transaction pursuant to Section III.1.10.7(f)(i) or with any FCA Cleared Export Transaction pursuant to Section III.1.10.7(f)(ii), reduced by that Market Participant's Real-Time Reserve Designations associated with Dispatchable Asset Related Demands within that Load Zone.

### **III.9.9.4 Allocating Remaining Forward Reserve Credits.**

For each hour, any Forward Reserve Credits not allocated pursuant to Section III.9.9.3 are allocated on a pro rata basis to each Market Participant's share of Real-Time Load Obligation in a Load Zone (which includes the Market Participant's Real-Time Load Obligation associated with any Capacity Export Through Import Constrained Zone Transaction pursuant to Section III.1.10.7(f)(i) or with any FCA Cleared Export Transaction pursuant to Section III.1.10.7(f)(ii), reduced by that Market Participant's Real-Time Reserve Designations associated with Dispatchable Asset Related Demands within that Load Zone) that meets the criteria in Section III.9.9.4.1. The allocation for each Load Zone is based on the

ratio of the Forward Reserve Credits cleared in the Respective Reserve Zone for the Forward Reserve Credits cleared in all Reserve Zones that meet the criteria in Section III.9.9.4.1, and is reduced by:

- (i) A prorated amount of any Forward Reserve Failure-to-Reserve Penalties or Forward Reserve Failure-to-Activate Penalties that occur in a Load Zone eligible to receive an allocation of Forward Reserve Credits pursuant to Section III.9.9.4.1, where the prorated amount is calculated based on the ratio of the total Forward Reserve Credits less any Forward Reserve Credits calculated in Section III.9.9.1 to the total Forward Reserve Credits.

**III.9.9.4.1 Allocation Criteria for Remaining Forward Reserve Credits.**

If the following criteria are met, then a Market Participant with Real-Time Load Obligation in a Load Zone is eligible to receive any remaining Forward Reserve Credits not allocated pursuant to Section III.9.9.3.

- (i) The Load Zone is encompassed in whole or in part in a Reserve Zone with a locational reserve requirement greater than zero, and
- (ii) The Forward Reserve Clearing Price of a Reserve Zone is higher than the Forward Reserve Clearing Price of the Rest of System.

### **III.9 Forward Reserve Market**

The Forward Reserve Market is a market to procure TMNSR and TMOR on a forward basis to satisfy forward TMNSR and TMOR requirements.

#### **III.9.1 Forward Reserve Market Timing.**

A Forward Reserve Auction will be held approximately two months in advance of each Forward Reserve Procurement Period. The Forward Reserve Auction input parameters and assumptions will be evaluated, published and reviewed with Market Participants prior to the Forward Reserve Auction.

The Forward Reserve Procurement Periods shall be the Winter Capability Period (October 1 through May 31) or the Summer Capability Period (June 1 through September 30), as applicable.

The Forward Reserve Delivery Period shall be hour ending 0800 through hour ending 2300 for each weekday of the Forward Reserve Procurement Period excluding those weekdays that are defined as NERC holidays.

#### **III.9.2 Forward Reserve Market Reserve Requirements.**

The ISO shall conduct an advance purchase of capability to satisfy the expected Forward Reserve requirements for the system and each Reserve Zone as calculated by the ISO in accordance with the following procedures and as specified more fully in the ISO New England Manuals. The Forward Reserve Market reserve requirements will be specified as part of the Forward Reserve Auction parameters and will be published and reviewed with Market Participants prior to each Forward Reserve Auction.

##### **III.9.2.1 Forward Reserve Market Reserve Requirements.**

The Forward Reserve Market requirements for the New England Control Area will be based on the forecast of the first and second contingency supply losses for the next Forward Reserve Procurement Period and will consist of the following:

- (i) One half of the forecasted first contingency supply loss will be specified as the minimum TMNSR to be purchased,
- (ii) An additional amount of TMNSR will be added to the minimum TMNSR if system conditions forecasted for the Forward Reserve Procurement Period indicate that the TMNSR available during the period would otherwise be insufficient to meet Real-Time Operating Reserve requirements. The additional amount of TMNSR shall be calculated to account for: (a) any historical under-performance of Resources dispatched in response to a system contingency and

(b) the likelihood that more than one half of the forecasted first contingency supply loss will be satisfied using TMNSR.

(iii) One half of the second contingency supply loss will be specified as the minimum TMOR to be purchased,

(iv) An amount of Replacement Reserve in the form of incremental TMOR will be specified in accordance with the Real-Time Replacement Reserve requirement as described in ISO New England Operating Procedure No. 8, Operating Reserve and Regulation and will be added to the minimum TMOR to be purchased.

The requirements specified above, further adjusted to respect the additional provisions described in Section III.9.2.2, represent the set of requirements that will be input into the Forward Reserve Auction.

### **III.9.2.2 Locational Reserve Requirements for Reserve Zones**

Locational reserve requirements will be established for each Reserve Zone. The locational reserve requirements will reflect the need for 30-minute contingency response to provide 2nd contingency protection for each import constrained Reserve Zone. The locational reserve requirements can be satisfied only by Resources that are located within a Reserve Zone and that are capable of providing 30-minute or higher quality reserve products.

The ISO shall establish the locational reserve requirements based on a rolling, two-year historical analysis of the daily peak hour operational requirements for each Reserve Zone for like Forward Reserve Procurement Periods. The ISO will commence the analysis on February 1 or the first business day thereafter for the subsequent summer Forward Reserve Procurement Period and on June 1 or the first business day thereafter for the subsequent winter Forward Reserve Procurement Period.

These daily peak hour requirements will be aggregated into daily peak hour frequency distribution curves and the MW value at the 95th percentile of the frequency distribution curve for each Reserve Zone will establish the locational requirement.

In the event of a change in the configuration of the transmission system or the addition, deactivation or retirement of a major generating Resource or Dispatchable Asset Related Demand, the rolling two-year historical analysis will be calculated in a manner that reflects the change in configuration of the

transmission system or the addition, deactivation or retirement of a major generating Resource or Dispatchable Asset Related Demand as of the commencement date of the analysis provided that the following conditions are met:

(a) Change in Configuration of the Transmission System

Any change in the configuration of the transmission system must have been placed in service and released for dispatch on or before December 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent summer Forward Reserve Procurement Period or on or before April 30 for inclusion in the analysis for setting the locational reserve requirements for the subsequent winter Forward Reserve Procurement Period.

If the change in the configuration of the transmission system consists of a new facility or upgrade of an existing facility, the facility must have operated at an availability level of at least 95% for the period beginning with its in service date and ending on January 31 prior to the summer Forward Reserve Procurement Period or ending on May 31 prior to the winter Forward Reserve Procurement Period.

(b) Addition, Deactivation or Retirement of a Major Generating Resource or Dispatchable Asset Related Demand

For the addition of a new generating Resource, the Resource must be placed in service and released for dispatch on or before December 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent summer Forward Reserve Procurement Period or on or before April 30 for inclusion in the analysis for setting the locational reserve requirements for the subsequent winter Forward Reserve Procurement Period. For the deactivation or retirement of a generating Resource or Dispatchable Asset Related Demand, the Resource must have been removed from service on or before January 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent summer Forward Reserve Procurement Period or on or before May 31 for inclusion in the analysis for setting the locational reserve requirements for the subsequent winter Forward Reserve Procurement Period.

The modified historical data set will be composed of actual data used in the operation of the reconfigured system and historical (pre-reconfiguration) data adjusted for the impact of the system reconfiguration. Pre-reconfiguration data will be revised by substituting values from the historical data set that are no longer valid with corresponding values used in the operation of the reconfigured system.

The locational reserve requirements will be recalculated using the modified historical data set until the rolling two-year historical data set reflects a common system configuration.

### **III.9.3 Forward Reserve Auction Offers.**

Forward Reserve Auction Offers for TMNSR and TMOR shall be (a) made on a \$/MW-month basis, (b) made on a Reserve Zone specific basis, (c) made on a non-Resource specific basis and (d) shall be less than or equal to the Forward Reserve Offer Cap. Forward Reserve Auction Offers shall be submitted to the ISO by Market Participants. The Market Participants are responsible for complying with the requirements of this Section III.9 if the Forward Reserve Auction Offer is accepted.

### **III.9.4 Forward Reserve Auction Clearing and Forward Reserve Clearing Prices.**

The Forward Reserve Auction shall simultaneously clear Forward Reserve Auction Offers to meet the Forward Reserve requirements for the system and each Reserve Zone using a mathematical programming algorithm. The objective of the mathematical programming based Forward Reserve Auction clearing is to minimize the total cost of Forward Reserve procured to meet the Forward Reserve requirements. The Forward Reserve Clearing Price for each Reserve Zone will reflect the cost to serve the next increment of reserve in that Reserve Zone based on the submitted offers. The Forward Reserve Auction algorithm substitutes higher quality TMNSR for lower quality TMOR to meet system or Reserve Zone TMOR requirements when it is economical to do so provided that no constraints are violated.

The Forward Reserve Auction algorithm shall also utilize excess Forward Reserve in one Reserve Zone to meet the Forward Reserve requirements of another Reserve Zone or the system provided that the Forward Reserve can be delivered such that no constraints are violated. In addition, the Forward Reserve Auction shall apply price cascading such that the Forward Reserve Clearing Price for TMOR in a Reserve Zone is always less than or equal to the Forward Reserve Clearing Price for TMNSR in that Reserve Zone. If there is insufficient supply to meet the Forward Reserve requirements for a Reserve Zone, the Forward Reserve Clearing Price for that Reserve Zone will be set to the Forward Reserve Offer Cap.

#### **III.9.4.1 Forward Reserve Clearing Price and Forward Reserve Obligation Publication and Correction.**

Market Participants with cleared Forward Reserve Auction Offers will receive a Forward Reserve Obligation for each Reserve Zone, as applicable, that is equal to the amount of Forward Reserve



megawatts cleared for that Market Participant adjusted for internal bilateral transactions that transfer Forward Reserve Obligations.

(a) Within five business days after the close of the Forward Reserve Auctions, the ISO shall post Forward Reserve Clearing Prices and Forward Reserve Obligations, which shall be final as posted, not subject to correction or other adjustment, and used for the purposes of settlement, except as provided in subsections (c) and (d). The permissibility of correction of errors in sections of Market Rule 1 relating to settlement and billing processes shall not apply to Forward Reserve Clearing Prices and Forward Reserve Obligations deemed final pursuant to this Section III.9.4.1.

(b) Before posting the final Forward Reserve Clearing Prices and Forward Reserve Obligations, the ISO shall make a good faith effort when clearing those markets to discover and correct any errors that may occur due to database, software or similar errors of the ISO or its systems before publishing the final prices awarded.

(c) If the ISO determines based on reasonable belief that there may be one or more errors in the final Forward Reserve Clearing Prices and Forward Reserve Obligations or if no Forward Reserve Clearing Prices and Forward Reserve Obligations are available due to human error, database, software or similar errors of the ISO or its systems, the ISO shall post on the ISO website prior to 11:59 p.m. of the third business day following the posting deadline specified in subsection (a), a notice that the Forward Reserve Clearing Prices and Forward Reserve Obligations are provisional and subject to correction or unavailable for initial publishing. The ISO shall confirm within three business days of posting a notice pursuant to this subsection whether there was an error in the Forward Reserve Clearing Prices and Forward Reserve Obligations and shall post a notice stating its findings.

(d) Within three business days after posting an initial notice pursuant to subsection (c); the ISO shall either: (1) publish final or corrected Forward Reserve Clearing Prices and Forward Reserve Obligations, or: (2) in the event that the ISO is unable to calculate and post final or corrected Forward Reserve Clearing Prices and Forward Reserve Obligations due to exigent circumstances not contemplated in this market rule, make an emergency filing with the Commission detailing the exigent circumstance which will not allow final Forward Reserve Clearing Prices and Forward Reserve Obligations to be calculated and posted, along with a proposed resolution including a timeline to post final prices.

### **III.9.5**

### **Forward Reserve Resources**

### **III.9.5.1 Assignment of Forward Reserve MWs to Forward Reserve Resources.**

(a) Prior to the close of the Re-Offer Period for each Operating Day of the Forward Reserve Procurement Period, Market Participants must convert their Forward Reserve Obligations into Resource-specific obligations by assigning Forward Reserve MWs to specific eligible Forward Reserve Resources, in accordance with procedures set forth in the ISO New England Manuals. The assignment of Forward Reserve MWs to a Forward Reserve Resource must be performed by the Lead Market Participant for the Resource.

(b) A Market Participant with a Forward Reserve Obligation must have an Ownership Share in a Forward Reserve Resource, in order to assign Forward Reserve MWs to that Forward Reserve Resource to fulfill that Market Participant's Forward Reserve Obligation. If more than one Market Participant has an Ownership Share in a Forward Reserve Resource, the Forward Reserve MWs assigned to that Resource will be allocated pro-rata to Market Participants by Ownership Share.

### **III.9.5.2 Forward Reserve Resource Eligibility Requirements.**

(a) Forward Reserve Resources are off-line or on-line Resources that have been assigned by Market Participants to meet their Forward Reserve Obligations. To be eligible as a Forward Reserve Resource, a Resource must satisfy the following criteria:

- (i) If the Resource is off-line, it must be a Fast Start Generator and have an audited CLAIM10 or CLAIM30 value established pursuant to Section III.9.5.3;
- (ii) If the Resource is expected to be on-line during a Forward Reserve Delivery Period, it must be able to produce the energy equivalent to its assigned Forward Reserve Obligation within the timeframe of the assigned Forward Reserve Obligation when operating within its dispatch range;
- (iii) If the Resource is an Asset Related Demand, it must have an audited CLAIM10 or CLAIM30 value established pursuant to Section III.9.5.3;
- (iv) The Resource may have a Capacity Supply Obligation for all, some, or none of its applicable Seasonal Claimed Capability. Any portion of the Resource to which a Forward Reserve Obligation has been assigned that is without a Capacity Supply Obligation must not have

been offered to support an External Transaction sale during the Operating Day for which it has been assigned;

(v) The Resource must have Electronic Dispatch Capability;

(vi) The Resource must follow ISO dispatch instructions during the Operating Day. The Resource must meet the technical requirements associated with the provision of Forward Reserve as specified in ISO New England Operating Procedure No. 14, Technical Requirements For Generation, Dispatchable and Interruptible Loads;

(vii) The portion of the Resource, with or without a Capacity Supply Obligation, that is assigned a Forward Reserve Obligation for any portion of an Operating Day must be eligible to provide Operating Reserve in accordance with the provisions of Section III.10.1.1;

(viii) The portion of the Resource without a Capacity Supply Obligation to which a Forward Reserve Obligation has been assigned must be offered into the Real-Time Energy Market in accordance with the provisions of III.13.6.1.1.2.

(b) If a Resource's audited CLAIM10 or CLAIM30 values have not been audited or tested pursuant to Section III.9.5.3 or Section III.9.5.4 at least once during any Forward Reserve Procurement Period, then the Resource's audited CLAIM10 or CLAIM30 values will be set to zero at the beginning of the succeeding Forward Reserve Procurement Period until new audited CLAIM10 or CLAIM30 values are established pursuant to Section III.9.5.3. At least 30 calendar days prior to the beginning of the next Forward Reserve Procurement Period, the ISO will notify Lead Market Participants or Designated Entities of any Resources that have not been audited or tested pursuant to Section III.9.5.3 or Section III.9.5.4 during the currently-effective Forward Reserve Procurement Period.

(c) External Resources will be permitted to participate in the Forward Reserve Market when the respective Control Areas implement the technology and processes necessary to support recognition of Operating Reserves from external Resources.

### **III.9.5.3 Establishment of Audited CLAIM10 and CLAIM30 Values.**

A Lead Market Participant or Designated Entity may establish an audited CLAIM10 or CLAIM30 value for a Resource by requesting either a formal audit or an economic dispatch audit. An audit request must

specify the type of audit that is being requested and the target performance level that the Resource will be tested against.

In the case of a formal audit:

1. The ISO will initiate the audit by issuing Dispatch Instructions without providing prior notice to the Lead Market Participant or Designated Entity.
2. There is no compensation for any costs associated with operating a Resource out of economic merit during the audit.
3. The ISO will normally perform the audit within three business days of receipt of the audit request and will advise the Lead Market Participant or Designated Entity if it will be unable to initiate the audit during the three business day period.

In the case of an economic dispatch audit:

1. The audit is initiated when a Resource is dispatched in economic merit following receipt of the audit request.

A Resource passes an audit if its demonstrated performance level is greater than or equal to its target performance level multiplied by 0.9.

In the case of a successful audit, the Resource's audited CLAIM10 or CLAIM30 values are set equal to the target performance level to be effective as of the 0001 hours of second business day following the day on which the audit was conducted.

In the case of an unsuccessful audit:

1. If the Resource had a prior audited CLAIM10 or CLAIM30 value of zero, then the audited CLAIM10 or CLAIM30 value will be set equal to the actual performance level demonstrated during the audit effective as of the second business day following the day on which the audit was conducted.

2. If the Resource had a prior audited CLAIM10 or CLAIM30 value greater than zero, then:
  - a) the audited CLAIM10 or CLAIM30 value will not be adjusted to reflect the results of the audit;
  - b) In the event of a formal audit, the existing record of performance-based testing and adjustment pursuant to Section III.9.5.4 will not be modified to reflect a test failure; and
  - c) In the event of an economic dispatch audit, the existing record of performance-based testing and adjustment pursuant to Section III.9.5.4 will be modified to reflect a test failure.

Except that the Lead Market Participant or Designated Entity may elect, within two business days following the day on which the audit was conducted, to direct the ISO to set the Resource's audited CLAIM10 or CLAIM30 values equal to the performance level demonstrated during the audit, which adjustment will become effective at 0001 hours on the fifth business day following the day on which the audit was conducted and in which case the record of any failures of performance-based testing pursuant to Section III.9.5.4 will be re-set to zero failures.

#### **III.9.5.4 Performance-Based Testing and Adjustment of CLAIM10 and CLAIM30 Values.**

A Resource's audited CLAIM10 and CLAIM30 values are subject to performance-based testing and adjustment during each instance in which the Resource is issued a Dispatch Instruction (except for a Dispatch Instruction associated with a formal audit pursuant to Section III.9.5.3), including any Dispatch Instruction associated with a request for a economic dispatch audit as provided in Section III.9.5.3. In the case of a performance-based test, the demonstrated performance of the Resource is compared to the target performance level, which is the lesser of the Resource's audited CLAIM10 or CLAIM30 value or the desired output level specified by the Dispatch Instruction.

A Resource passes a performance-based test if its demonstrated performance level is greater than or equal to its target performance level multiplied by 0.9.

If a Resource fails to pass a performance-based test, then the Resource's audited CLAIM10 or CLAIM30 values will be adjusted as follows (with the Resource's audited CLAIM10 or CLAIM30 value as determined pursuant to Section III.9.5.3 continuing to be used for reference purposes):

First failure – CLAIM10 or CLAIM30 value is not adjusted.

Second failure – adjusted CLAIM10 or CLAIM30 value is set equal to 0.75 multiplied by the Resource's audited CLAIM10 or CLAIM30 value.

Third failure – adjusted CLAIM10 or CLAIM30 value is set equal to 0.50 multiplied by the Resource's audited CLAIM10 or CLAIM30 value.

Fourth failure – adjusted CLAIM10 or CLAIM30 value is set equal to 0.25 multiplied by the Resource's audited CLAIM10 or CLAIM30 value.

Fifth failure – adjusted CLAIM10 or CLAIM30 value is set equal to zero.

One or more failures followed by ten consecutive passes – adjusted CLAIM10 or CLAIM30 value is re-set equal to the last audited CLAIM10 or CLAIM30 value determined pursuant to Section III.9.5.3 and the record of performance-based test failures is set equal to zero effective as of 0001 hours of the second business day following the date on which the performance-based test was conducted.

Any adjustments resulting from a failed performance-based test, except for adjustments associated with ten consecutive passes, will become effective as of 0001 hours of the fifth business day following the day on which the test was conducted.

If an audited CLAIM10 or CLAIM30 value has been adjusted as the result of a performance-based test failure, a Lead Market Participant or Designated Entity may seek to re-establish a new, audited CLAIM10 or CLAIM30 value in accordance with Section III.9.5.3.

### **III.9.6 Delivery of Reserve.**

#### **III.9.6.1 Dispatch and Energy Bidding of Reserve.**

Forward Reserve shall be delivered by Forward Reserve Resources by offering the capability into the Real-Time Energy Market by submitting Supply Offers and Demand Bids, prior to the close of the Re-Offer Period, at or above the Forward Reserve Threshold Price for the Operating Day. Day-Ahead Energy

Market Supply Offers and Demand Bids for Resources to which Forward Reserve Obligations have been assigned will be used in the Real-Time Energy Market for the associated Operating Day even if the Supply Offers do not clear the Day-Ahead Energy Market, notwithstanding the requirements of Market Rule 1 Section III.13.6.2.1.1.2, unless superseded by a more recent Supply Offer or Demand Bid submitted prior to the close of the Re-Offer Period. A Market Participant is not required to submit a Supply Offer or Demand Bid into the Day-Ahead Energy Market for a Resource without a Capacity Supply Obligation in order for the Resource to be eligible to be a Forward Reserve Resource. The Forward Reserve Threshold Prices shall be set in accordance with the ISO New England Manuals so that Forward Reserve Resource capability has (a) a low probability of being dispatched for energy and (b) a high probability of being held for reserve purposes.

Forward Reserve Resources are scheduled and operated in accordance with Section III.1 of Market Rule 1; no distinction is made due to their status as Forward Reserve Resources. Forward Reserve Resources are eligible to set the Locational Marginal Price in accordance with Section III.2 of Market Rule 1.

#### **III.9.6.2 Forward Reserve Threshold Prices.**

The formula for determining the Forward Reserve Threshold Prices shall be fixed for the duration of the Forward Reserve Procurement Period. The ISO will reevaluate the Forward Reserve Threshold Price level for successive Forward Reserve Auctions on the basis of experience, expected operating conditions and other relevant information.

**Forward Reserve Threshold Price:** is calculated as the Forward Reserve Heat Rate multiplied by the daily Forward Reserve Fuel Index.

**Forward Reserve Heat Rate:** shall be fixed for the duration of the Forward Reserve Procurement Period and announced in the announcement for the Forward Reserve Auction. New Forward Reserve Heat Rates shall be specified for successive auctions, and shall be the lesser of: (a) the value determined in accordance with applicable ISO New England Manuals; or (b) the heat rate defined for the PER Proxy Unit in Section III.13.7.2.7.1.1.1(b) less 1 Btu/kWh.

**Forward Reserve Fuel Index:** is a daily fuel index, or combination of daily indices, applicable to the New England Control Area and specified in the announcement of the Forward Reserve Auction.

#### **III.9.6.3 Monitoring of Forward Reserve Resources.**

In accordance with Section III.A.9.4 of *Appendix A* of this Market Rule 1, the Internal Market Monitor will receive information that will identify Forward Reserve Resources, the Forward Reserve Threshold Price, and the assigned Forward Reserve Obligation. Prior to mitigation of Supply Offers or Demand Bids associated with a Forward Reserve Resource, the Internal Market Monitor shall consult with the Participant in accordance with Market Rule 1, *Appendix A*, Section III.A.3. The Internal Market Monitor and the Market Participant shall consider the impact on meeting any Forward Reserve Obligations in those consultations. If mitigation is imposed, any mitigated offers shall be used in the calculation of qualifying megawatts under Section III.9.6.4.

**III.9.6.4 Forward Reserve Qualifying Megawatts.**

Qualifying megawatts are calculated separately on an hourly basis for Forward Reserve Resources supplying Forward Reserve from an off-line state and Forward Reserve Resources supplying Forward Reserve from an on-line state as follows:

**Off-line qualifying megawatts.** Off-line qualifying megawatts are the amount of capability equal to or below the Economic Maximum Limit for an off-line Forward Reserve Resource offered at or above the Forward Reserve Threshold Price. The generating Resource must satisfy this requirement in the Real-Time Energy Market. In the case of off-line Forward Reserve Resources, the calculation for Forward Reserve Qualifying Megawatts shall include both the energy Supply Offer and a pro-rated amount of Start-Up Fees and No-Load Fees as defined below.

An off-line Forward Reserve Resource must offer its capability so that the following holds:

$$\frac{StartUp}{EcoMax \times 1 \text{ hour}} + \frac{NoLoad}{EcoMax} + Energy \ Offer_i \geq ForwardReserveThresholdPrice$$

where:

- StartUp* = the generating Resource’s cold Start-Up Fee.
- NoLoad* = the generating Resource’s No-Load Fee.
- EnergyOffer<sub>i</sub>* = the generating Resource’s Energy Offer for Energy Offer block *i*.
- EcoMax* = the Economic Maximum Limit.



**On-line qualifying megawatts:** is the capability that is less than or equal to the Economic Maximum Limit and above the Economic Minimum Limit that is offered at or above the applicable Forward Reserve Threshold Price by an on-line generating Resource or, is the capability that is less than or equal to the Maximum Consumption Limit and greater than the Minimum Consumption Limit offered at or above the applicable Forward Reserve Threshold Price by a Dispatchable Asset Related Demand Resource. The Forward Reserve Resource must satisfy this requirement in the Real-Time Energy Market. For an on-line generating Resource that has been assigned to meet a Forward Reserve Obligation and has not cleared in the Day-Ahead Energy Market and is operating in a delivery hour as the result of an ISO commitment for VAR or local second contingency protection, the on-line qualifying megawatts shall be zero.

### **III.9.6.5 Delivery Accounting.**

Forward Reserve Delivered Megawatts are the quantity of Forward Reserve delivered in each hour of the Real-Time Energy Market to each Reserve Zone and is calculated as follows.

- (a) Forward Reserve Delivered Megawatts for an off-line Forward Reserve Resource are calculated in megawatts for each hour of the Real-Time Energy Market for each Reserve Zone as the minimum of:
- (i) the amount, in MW, of Forward Reserve that the off-line generating Resource can provide, based upon CLAIM10 and CLAIM30 values provided in the generating Resource's Real-Time Supply Offer,
  - (ii) Forward Reserve Assigned Megawatts, or
  - (iii) Forward Reserve Qualifying Megawatts for that Resource (energy at or above the applicable Forward Reserve Threshold Price per Section III.9.6.2), less any previously accounted for Forward Reserve Delivered Megawatts for that Resource.
- (b) Forward Reserve Delivered Megawatts for an on-line generating Resource are calculated in megawatts for each hour for each Reserve Zone as the minimum of:
- (i) 10 or 30 times the MW/minute ramping rate of the on-line generating Resource, as applicable,
  - (ii) Forward Reserve Assigned Megawatts, or

(iii) Forward Reserve Qualifying Megawatts for that Resource (MW offered at or above the applicable Forward Reserve Threshold Price per Section III.9.6.2)

less any previously accounted for Forward Reserve Delivered Megawatts for that Resource.

(c) Forward Reserve Delivered Megawatts for a Dispatchable Asset Related Demand are calculated in megawatts for each hour of the Real-Time Energy Market for each Reserve Zone as the minimum of:

(i) 10 or 30 times the MW/minute ramp rate of the Resource, as applicable,

(ii) the amount of Forward Reserve capability specified in the Resource's CLAIM10 and CLAIM30 values,

(iii) Forward Reserve Assigned Megawatts, or

(iv) Forward Reserve Qualifying Megawatts for that Resource (MW offered at or above the applicable Forward Reserve Threshold Price per Section III.9.6.2),

less any previously accounted for Forward Reserve Delivered Megawatts for that Resource.

(d) A Forward Reserve Resource's hourly Forward Reserve Delivered Megawatts for each Reserve Zone is calculated as the sum of the Market Participant's Resource specific hourly Forward Reserve Delivered Megawatts for each Reserve Zone.

(e) Resource specific Forward Reserve Delivered Megawatts for TMNSR within a Reserve Zone will be applied first to a Market Participant's higher value Forward Reserve Obligation for TMNSR in that Reserve Zone. Any surplus Forward Reserve Delivered Megawatts for TMNSR in that Reserve Zone will be applied to meet the Market Participant's Forward Reserve Obligation for TMOR in that Reserve Zone. Forward Reserve Delivered Megawatts remaining within that Reserve Zone after the Market Participant's Forward Reserve Obligation for that Reserve Zone have been met is available to be applied to the Market Participant's Forward Reserve Obligations in other Reserve Zones provided that the Forward Reserve Delivered Megawatts can be delivered to the other Reserve Zones.

### **III.9.7 Consequences of Delivery Failure.**

### **III.9.7.1 Real-Time Failure-to-Reserve.**

A Real-Time Forward Reserve Failure-to-Reserve occurs when a Market Participant's Forward Reserve Delivered Megawatts for a Reserve Zone in an hour is less than that Market Participant's Forward Reserve Obligation for that Reserve Zone in that hour. Under these circumstances the Market Participant pays a penalty based upon the Forward Reserve Failure-to-Reserve Penalty Rate and that Market Participant's Forward Reserve Failure-to-Reserve Megawatts.

(a) Forward Reserve Failure-to-Reserve Megawatts: A Market Participant's Forward Reserve Failure-to-Reserve Megawatts for TMNSR for a Reserve Zone is defined as, for each hour, the amount that is the maximum of the following values:

- (i) Market Participant Forward Reserve Obligation for TMNSR for that Reserve Zone minus the Market Participant's Forward Reserve Delivered Megawatts for TMNSR for that Reserve Zone; and
- (ii) Zero.

A Market Participant's Forward Reserve Failure-to-Reserve Megawatts for TMOR for a Reserve Zone is defined as, for each hour, the amount that is the maximum of the following values:

- (i) Market Participant Forward Reserve Obligation for TMOR for that Reserve Zone minus Market Participant's Forward Reserve Delivered Megawatts for TMOR for that Reserve Zone; and
- (ii) Zero.

(b) Forward Reserve Failure-to-Reserve Penalties: A Market Participant's Forward Reserve Failure-to-Reserve Penalty for a Reserve Zone in an hour is defined as:

- (i) Forward Reserve Failure-to-Reserve Penalty for TMNSR = Forward Reserve Failure-to-Reserve Penalty Rate multiplied by the Forward Reserve Failure-to-Reserve Megawatts for TMNSR; and

(ii) Forward Reserve Failure-to-Reserve Penalty for TMOR = Forward Reserve Failure-to-Reserve Penalty Rate multiplied by the Forward Reserve Failure-to-Reserve Megawatts for TMOR;

Where:

Forward Reserve Failure-to-Reserve Penalty Rate = 1.5 multiplied by the Forward Reserve Payment Rate

### **III.9.7.2 Failure-to-Activate Penalties.**

Market Participants are required to pay a Forward Reserve Failure-to-Activate Penalty for each Forward Reserve Resource that fails to activate its Forward Reserve capability when requested to do so by the ISO as part of the real-time contingency dispatch algorithm.

When a Market Participant's Forward Reserve Resource has been determined by the ISO to have failed to activate Forward Reserve, which determination shall be made in accordance with the ISO New England Manuals, that Market Participant shall be required to pay a Forward Reserve Failure-to-Activate Penalty associated with that Resource as follows:

#### **(a) Forward Reserve Failure-to-Activate Megawatts:**

A Market Participant's Forward Reserve Failure-to-Activate Megawatts for TMNSR for a Resource is defined as, for each hour, the amount that is the lesser of the following values:

- (i) Maximum of Forward Reserve Delivered Megawatts for TMNSR minus actual amount of TMNSR energy delivered during activation, or zero;
- (ii) Maximum of Target Activation Megawatts for TMNSR minus actual amount of TMNSR energy delivered during activation, or zero;

Where:

Target Activation Megawatts for TMNSR is the target MW output issued by the ISO in a Dispatch Instruction for that Resource in response to a need to activate TMNSR.

A Market Participant's Forward Reserve Failure-to-Activate Megawatts for TMOR for a Resource is defined as, for each hour, the amount that is the lesser of the following values:

(i) Maximum of Forward Reserve Delivered Megawatts for TMOR plus Forward Reserve Delivered Megawatts for TMNSR minus Forward Reserve Failure-to-Activate Megawatts for TMNSR minus actual amount of TMOR energy delivered during activation, or zero;

(ii) Maximum of Target Activation Megawatts for TMOR minus Forward Reserve Failure-to-Activate Megawatts for TMNSR minus actual amount of TMOR energy delivered during activation, or zero;

Where:

Target Activation Megawatts for TMOR is the target MW output issued by the ISO in a Dispatch Instruction for that Resource in response to a need to activate TMOR.

**(b) Forward Reserve Failure-to-Activate Penalties:**

A Market Participant's Forward Reserve Failure-to-Activate Penalty for a Resource in an hour is defined as:

(i) Forward Reserve Failure-to-Activate Penalty for TMNSR = The sum of the Forward Reserve Payment Rate for TMNSR and the Forward Reserve Failure-to-Activate Penalty Rate multiplied by the Forward Reserve Failure-to-Activate Megawatts for TMNSR; and

(ii) Forward Reserve Failure-to-Activate Penalty for TMOR = The sum of the Forward Reserve Payment Rate for TMOR and the Forward Reserve Failure-to-Activate Penalty Rate multiplied by the Forward Reserve Failure-to-Activate Megawatts for TMOR;

Where:

Forward Reserve Failure-to-Activate Penalty Rate = Maximum of 2.25 multiplied by the Forward Reserve Payment Rate, or the applicable nodal LMP.

(c) A Forward Reserve Resource that is a Fast Start Generator that fails to activate Forward Reserve through a failure to start shall have its Forward Reserve Delivered Megawatts set equal to zero in each subsequent hour in the applicable Forward Reserve Delivery Period until such time that the Market Participant notifies the ISO that the subject Forward Reserve Resource is capable of providing the Forward Reserve Delivered Megawatts.

### **III.9.7.3 Known Performance Limitations.**

The ISO may have reason to believe that a particular Forward Reserve Resource is frequently receiving, or may frequently receive, Forward Reserve payments for a portion or all of its capability that is not capable of activating the Forward Reserve Assigned Megawatts for TMNSR or the Forward Reserve Assigned Megawatts for TMOR. When the ISO believes there is such a limited Forward Reserve Resource, the ISO shall contact and confer with the affected Market Participant before taking any action.

(a) The ISO will, whenever practicable, contact the affected Market Participant of the Forward Reserve Resource to request an explanation of the relevant resource Offer Data;

(b) If the explanation, if available, considered together with other information available to the ISO, indicates to the satisfaction of the ISO that the questioned Forward Reserve payments are consistent with Forward Reserve Resource capabilities, no further action will be taken; and

(c) If no agreement is reached, or an acceptable explanation is not provided, the Market Participant may request a Resource performance audit as specified in ISO New England Manuals. If the Forward Reserve Resource fails the performance audit or the Market Participant refuses to request a Resource performance audit, the ISO may take remedial action. Remedial actions may include, but are not limited to: (i) redeclaration, by the ISO, of any relevant operational Offer Data parameter, or (ii) removing the asset or the relevant portion of the asset's capability to provide Forward Reserve on a going-forward basis.

### **III.9.8 Forward Reserve Credits.**

Payment for Forward Reserve is based upon a Market Participant's Final Forward Reserve Obligation and the applicable Forward Reserve Clearing Prices. The ISO shall calculate these credits on an hourly basis for each Reserve Zone as follows:

(a) Final Forward Reserve Obligations for TMNSR and TMOR for each Market Participant are calculated for each Reserve Zone for each hour as follows:

(i) Final Forward Reserve Obligation = minimum [Forward Reserve Obligation, Forward Reserve Delivered Megawatts]

(b)  $FCACP_{Zone}$  and  $FRACP_{Zone}$  are defined as:

$FCACP_{Zone}$  for a Reserve Zone is the Forward Capacity Auction Capacity Clearing Price for the Capacity Zone in which the Reserve Zone is contained.

$FCACP_{Zone}$  for the Rest of System is the maximum Forward Capacity Auction Capacity Clearing Price for all Capacity Zones included in whole or in part in the Rest of System.

$FRACP_{Zone}$  is the Forward Reserve Clearing Price for the relevant Reserve Zone, for TMNSR or TMOR, respectively;

(c) Market Participant Forward Reserve Credit for TMNSR=Final Forward Reserve Obligation for TMNSR multiplied by the applicable hourly Forward Reserve Payment Rate for TMNSR;

where,

the hourly Forward Reserve Payment Rate for TMNSR is equal:

maximum of [(applicable monthly  $FRACP_{Zone}$  for TMNSR –  $FCACP_{Zone}$ ), 0] divided by the number of hours in the month associated with the Forward Reserve Delivery Period.

(d) Market Participant Forward Reserve Credit for TMOR =  
Final Forward Reserve Obligation for TMOR multiplied by  
the applicable hourly Forward Reserve Payment Rate for  
TMOR; where,

the hourly Forward Reserve Payment Rate for TMOR is equal to:

maximum of [(applicable monthly FRACP<sub>zone</sub> for TMOR - FCACP<sub>zone</sub>),0]  
divided by the number of hours in the month associated with the Forward  
Reserve Delivery Period.

### **III.9.9 Forward Reserve Charges.**

Forward Reserve Charges are allocated to each Market Participant in two steps. The first step allocates the Forward Reserve Credits associated with the procurement of reserves to meet the Forward Reserve requirement for the system. The second step, if necessary, allocates any remaining Forward Reserve Credits.

#### **III.9.9.1 Forward Reserve Credits Associated with System Reserve Requirement.**

The portion of Forward Reserve Credits associated with the procurement of the Forward Reserve requirement for the system is determined by simulating a Forward Reserve Auction using all submitted Forward Reserve Auction Offers to meet only the Forward Reserve Market minimum requirements for the New England Control Area pursuant to Section III.9.2.1. The simulated Forward Reserve Auction will clear offers pursuant to the methodology set forth in Section III.9.4 to calculate TMNSR and TMOR proxy system clearing prices. The TMNSR and TMOR proxy system clearing prices will reflect the cost to serve the next increment of reserve above the Forward Reserve Market minimum requirement for the New England Control Area.

For each hour, the total amount of Forward Reserve Credits associated with the procurement of the Forward Reserve requirement for the system is calculated as the lesser of:

- (i) The TMNSR Forward Reserve Market minimum requirement for the New England Control Area pursuant to Section III.9.2.1 multiplied by the maximum of the [TMNSR proxy system clearing price reduced by the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, 0], plus the TMOR Forward Reserve Market minimum requirement for the New England Control Area pursuant to Section III.9.2.1 multiplied by the maximum of the [TMOR proxy system clearing price reduced by the Capacity Clearing Price for the Rest-of-Pool Capacity Zone, 0] and divided by the number of hours in the month associated with the Forward Reserve Delivery Period, or
- (ii) Total Forward Reserve Credits for the New England Control Area as calculated pursuant to Section III.9.8.

#### **III.9.9.2 Adjusting Forward Reserve Credits for System Requirement.**



For each hour, the Forward Reserve Credits associated with the procurement of the Forward Reserve requirement for the system is reduced by:

- (i) Any Forward Reserve Failure-to-Reserve Penalty or Forward Reserve Failure-to-Activate Penalty that occurs in the Rest of System or in a Load Zone that is ineligible to receive an allocation of Forward Reserve Credits pursuant to Section III.9.9.4.1, and
- (ii) A prorated amount of any Forward Reserve Failure-to-Reserve Penalty or Forward Reserve Failure-to-Activate Penalty that occurs in a Load Zone that is eligible to receive an allocation of Forward Reserve Credits pursuant to Section III.9.9.4.1, where the prorated amount is calculated based on the ratio of Forward Reserve Credits calculated in Section III.9.9.1 to the total Forward Reserve Credits.

### **III.9.9.3 Allocating Forward Reserve Credits for System Requirements.**

For each hour, the Forward Reserve Credits associated with the procurement of the Forward Reserve requirements for the system as calculated pursuant to Section III.9.9.1, is reduced by any penalties calculated pursuant to Section III.9.9.2, and allocated on a pro rata basis using each Market Participant's share of Real-Time Load Obligation in each Load Zone (which includes the Market Participant's Real-Time Load Obligation associated with any Capacity Export Through Import Constrained Zone Transaction pursuant to Section III.1.10.7(f)(i) or with any FCA Cleared Export Transaction pursuant to Section III.1.10.7(f)(ii), reduced by that Market Participant's Real-Time Reserve Designations associated with Dispatchable Asset Related Demands within that Load Zone.

### **III.9.9.4 Allocating Remaining Forward Reserve Credits.**

For each hour, any Forward Reserve Credits not allocated pursuant to Section III.9.9.3 are allocated on a pro rata basis to each Market Participant's share of Real-Time Load Obligation in a Load Zone (which includes the Market Participant's Real-Time Load Obligation associated with any Capacity Export Through Import Constrained Zone Transaction pursuant to Section III.1.10.7(f)(i) or with any FCA Cleared Export Transaction pursuant to Section III.1.10.7(f)(ii), reduced by that Market Participant's Real-Time Reserve Designations associated with Dispatchable Asset Related Demands within that Load Zone) that meets the criteria in Section III.9.9.4.1. The allocation for each Load Zone is based on the ratio of the Forward Reserve Credits cleared in the Respective Reserve Zone for the Forward Reserve Credits cleared in all Reserve Zones that meet the criteria in Section III.9.9.4.1, and is reduced by:

- (i) A prorated amount of any Forward Reserve Failure-to-Reserve Penalties or Forward Reserve Failure-to-Activate Penalties that occur in a Load Zone eligible to receive an allocation of Forward Reserve Credits pursuant to Section III.9.9.4.1, where the prorated amount is calculated based on the ratio of the total Forward Reserve Credits less any Forward Reserve Credits calculated in Section III.9.9.1 to the total Forward Reserve Credits.

**III.9.9.4.1 Allocation Criteria for Remaining Forward Reserve Credits.**

If the following criteria are met, then a Market Participant with Real-Time Load Obligation in a Load Zone is eligible to receive any remaining Forward Reserve Credits not allocated pursuant to Section III.9.9.3.

- (i) The Load Zone is encompassed in whole or in part in a Reserve Zone with a locational reserve requirement greater than zero, and
- (ii) The Forward Reserve Clearing Price of a Reserve Zone is higher than the Forward Reserve Clearing Price of the Rest of System.

1 UNITED STATES OF AMERICA  
2 BEFORE THE  
3 FEDERAL ENERGY REGULATORY COMMISSION

4 )  
5 **ISO New England Inc.** ) **Docket No. ER13-\_\_\_\_-000**  
6 )

7  
8  
9  
10 **TESTIMONY OF CHRISTOPHER A. PARENT**  
11

12  
13  
14  
15 **I. IDENTIFICATION OF WITNESSES**

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

17 A: My name is Christopher A. Parent. I am the Manager of the Market Development  
18 Department at ISO New England Inc. My business address is One Sullivan Road,  
19 Holyoke, Massachusetts 01040.

20  
21 **Q: Please summarize your job responsibilities at ISO New England Inc.**

22 A: *Mr. Parent.* I have been with ISO New England Inc. (the "ISO") since July 2004  
23 and have held various positions within the organization, including Supervisor of  
24 Hourly Settlements, Supervisor of Business Analysis, and Manager of Business  
25 Development. I was also Manager, Quality & Business Process Development  
26 reporting to the Chief Operating Officer until December 2009 when I became the  
27 Manager of the Market Development Department reporting to Dr. Robert Ethier,  
28 the Vice President of Market Development. In my present position, I am  
29 responsible for coordinating the market development work at the ISO. By

1 working closely with my staff, internal business units and external stakeholders  
2 on proposed changes to the market design, I help to ensure that proposed solutions  
3 to market issues address the identified scope efficiently and effectively and that  
4 they are fully vetted through the internal ISO review and external stakeholder  
5 processes.

6

7 **Q: Please summarize your experience and qualifications prior to joining the**  
8 **ISO.**

9 A: *Mr. Parent.* Prior to joining the ISO, I worked for Accenture (formally Andersen  
10 Consulting) as an energy industry consultant. My clients included both energy  
11 trading companies and Independent System Operators and Regional Transmission  
12 Organizations (ISOs/RTOs). When working with the ISOs/RTOs, I was  
13 responsible for developing business and technology solutions to implement their  
14 market designs. When working with energy companies, my primary focus was on  
15 developing business and technology solutions to support their trading and back-  
16 office processes.

17

18 I hold a B.S. in Business Administration with a minor in Computer Science from  
19 St. Michael's College in Vermont.

20

1 **II. PURPOSE, SCOPE AND BACKGROUND OF DIRECT TESTIMONY**

2 **Q: What is the purpose of your testimony?**

3 A: The purpose of my testimony is to explain why the ISO is proposing  
4 modifications to the determination of the Ten Minute Non-Spinning Reserve, or  
5 TMNSR, requirement in the Forward Reserve Market.

6

7 **Q: Why is the ISO proposing to make these revisions at this time?**

8 A: These revisions are a counter-part to changes in real-time reserve levels that the  
9 ISO implemented in the summer of 2012 to address concerns with generator  
10 underperformance when activated to respond to a contingency. This type of  
11 underperformance was a contributing factor in the Disturbance Control Standard  
12 violation experienced by the ISO on September 2, 2010.

13

14 **Q: Please describe the changes to the real-time reserve levels implemented in the**  
15 **summer of 2012.**

16 A: Previously, the ISO maintained a 10-minute reserve level that assumed 100%  
17 performance of resource offered capability. The ISO's historical analysis  
18 indicates consistently less than 100% performance when resources are dispatched  
19 in response to a contingency

20

21 On July 23, 2012, the ISO modified the amount of 10-minute reserves it requires  
22 in real-time to reflect a 20% average fleet-wide historical non-performance of  
23 resources called upon after a contingency (*i.e.*, resources providing 10-minute

1 reserves). This modification helps ensure that the ISO is meeting applicable  
2 NERC and NPCC reliability standards that address required available reserves in  
3 the event of a large source loss. Specifically, to meet the requirements of NERC  
4 Reliability Standard BAL-002, R2, the ISO utilizes NPCC Directory 5 Reserve  
5 requirements, which include the requirement to “have ten-minute reserve  
6 available to [the Balancing Authority] that is at least equal to its first contingency  
7 loss.”

8

9 **Q: You indicated that the Forward Reserve Market revisions are a counterpart**  
10 **to the changes to real-time reserve levels implemented in the summer of**  
11 **2012. Please explain how the Forward Reserve Market relates to real-time**  
12 **reserves.**

13 A: The Forward Reserve Market consists of Forward Reserve Auctions held twice  
14 per year, one for each seasonal delivery period, summer (June 1<sup>st</sup> – September  
15 30<sup>th</sup>) and winter (October 1<sup>st</sup> -May 31<sup>st</sup>). The Forward Reserve Auction, through a  
16 cost-minimizing uniform-price algorithm, sets a clearing price for each reserve  
17 product in each Reserve Zone. The Forward Reserve Auction seeks to procure  
18 sufficient reserve obligations in order to satisfy the New England system-wide  
19 TMNSR requirement, the New England system-wide TMOR requirement, and  
20 any local TMOR requirement in a Reserve Zone. Market Participants whose  
21 offers clear in the Forward Reserve Auction receive Forward Reserve Obligations  
22 on a portfolio basis. The portfolio obligations are not tied to a specific resource

1           until near real-time when the Market Participant assigns the actual resource that  
2           will be available to deliver reserve and energy for the particular operating day.

3  
4           Market Participants face a Failure to Reserve penalty if they fail to “assign”  
5           resources or if the assigned resources are unavailable to meet a Forward Resource  
6           Obligation. Market Participants with resources assigned to meet Forward Reserve  
7           Market obligations that are dispatched in response to a system contingency face a  
8           failure to perform penalty for any underperformance. Thus, the Forward Reserve  
9           Market creates incentives to make reserve resources available and ready to  
10          respond in real-time in the event of a contingency.

11

### 12   **III.   EXPLANATION OF PROPOSED TARIFF CHANGES**

13   **Q:   Which aspects of the Forward Reserve Market rules is the ISO revising?**

14   A:   The ISO is modifying the rules that determine the amount of TMNSR which the  
15          ISO will procure through the Forward Reserve Auction.

16

17   **Q:   How much TMNSR is currently procured through the Forward Reserve**  
18          **Market?**

19   A:   The current Forward Reserve Market rules call for the ISO to procure in each  
20          Forward Reserve Auction an amount of TMNSR equal to 50% of a forecast of  
21          New England’s largest first contingency. The ISO evaluates the size of the largest  
22          first contingency over a recent historical period to determine the appropriate

1 forecast value. The largest first contingency has fluctuated between 1600 and  
2 1800 since 2010.

3

4 **Q: What are the proposed revisions to the TMNSR procurement?**

5 A: The ISO is proposing to modify the Forward Reserve Market rules to adjust the  
6 TMNSR requirement to mirror how real-time reserves are determined. The ISO  
7 will continue to use 50% of the largest contingency to determine the minimum  
8 amount of TMNSR in the Forward Reserve market, and will adjust this value  
9 based upon the historical performance of reserve resources in real-time and based  
10 upon how real-time 10-minute reserves are allocated between spinning and non-  
11 spinning resources.

12

13 **Q: Why is it appropriate to include in the rules provision for an increase in**  
14 **TMNSR procurement in this manner?**

15 A: Increasing the amount of TMNSR procured in the Forward Reserve Market  
16 supports the July 2012 increase in real-time reserves by ensuring the procurement  
17 of sufficient reserve resources that have the performance incentives of the  
18 Forward Reserve Market and subsequently are available in real-time to respond to  
19 system contingencies.

20

21 **Q: Please explain further the evaluation that the ISO will perform to determine**  
22 **the appropriate adjustment to the minimum TMNSR value.**



1 A: The minimum TMNSR value will be increased as necessary to account for two  
2 factors: (a) any historical under-performance of resources dispatched in response  
3 to a system contingency and (b) the likelihood that more than one half of the  
4 forecasted first contingency supply loss will be satisfied using TMNSR.

5  
6 Accounting for the historical underperformance of reserve resources in the  
7 TMNSR calculation will help ensure that the resources available to provide  
8 reserves in real-time have sufficient reserve capacity to meet real-time reserve  
9 requirements despite the likelihood of resource underperformance.

10

11 In addition, the second factor – considering the amount of TMNSR that is likely  
12 to be used in real-time to restore a first contingency supply loss – helps ensure  
13 that the amount of TMNSR procured takes account of changes in system  
14 conditions and changes in New England’s fleet of reserve resources. As operating  
15 conditions in New England change, and as the mix of resources available to  
16 provide reserves changes, the likelihood that a major supply loss will be restored  
17 through activation of spinning (online) vs. non-spinning (offline) reserves also  
18 changes. Since conditions and resource mix are not static, it is appropriate to  
19 factor into the TMNSR procurement for the Forward Reserve Market the  
20 possibility that system conditions and the resource mix will be such that more  
21 than 50% of a first contingency loss will be restored through the use of TMNSR.  
22 The proposed TMNSR Procurement Revisions account for such an analysis.

23

1 **Q: Will the analysis of the need to increase the TMNSR procurement in the**  
2 **Forward Reserve Market be performed in conjunction with future analyses**  
3 **to determine the need for an increase in real-time reserves?**

4 A: Yes, the ISO plans to evaluate resource performance and adjust the amount of  
5 real-time 10-minute reserves to reflect how resources have historically performed.  
6 This information would be used to determine the amount of the non-performance  
7 adjustment to be applied to the TMNSR requirement in the Forward Reserve  
8 Market.

9  
10 The evaluation to determine whether an increase in the TMNSR procurement is  
11 necessary will also take account of the results of the recently filed generator audit  
12 rules for fast start resources.

13  
14 **Q: Can you explain further how the TMNSR procurement analysis is impacted**  
15 **by the implementation of the revised audit rules?**

16 A: Yes. On November 6, 2012, ISO tariff revisions were filed to enhance the  
17 auditing requirements for generation resources. Those revisions included  
18 substantial changes to the requirements for auditing the capability of resources  
19 that provide TMNSR, including revisions to better capture the historical  
20 performance of the resource in the audit value of the resource (*i.e.*, the value that  
21 captures the 10-minute capability of the resource). The ISO anticipates that as the  
22 new audit program is implemented in 2013, and as the historical performance  
23 value of resources is factored into their 10-minute capability values over time,

1 those values (and hence the amount of Forward Reserve Obligation that a  
2 participant is able to assign to a resource) will better reflect the true capability of  
3 the resource. This should reduce the circumstances under which the ISO will  
4 utilize the new provision permitting the adjustment to the TMNSR procurement in  
5 the Forward Reserve Market, since there should be convergence between the  
6 historical performance of reserve resources and the reserve capability values of  
7 resources used for meeting Forward Reserve Obligations. Nevertheless, it is  
8 appropriate to implement the provision permitting the TMNSR adjustment at this  
9 time in order to help ensure the availability of appropriate reserve in the interim  
10 period.

11

12 **Q: Does this conclude your testimony?**

13 **A:** Yes.

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9  
10

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 20, 2012.



---

Christopher A. Parent



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\*Contacts on this list are included on the distribution lists used by Legal, Finance and Risk Management for email correspondence and notices. Updates should be sent to the "Membership Coordinator" list in the global address list of Outlook so changes can be made in the CAMS system. In the email to the membership coordinator:

1. Identify in the subject that it is an update to the external affairs company/contact information in CAMS
2. Include in the body of the email the company what is being updated and what the updates are.

## **New England Governors, State Utility Regulators and Related Agencies\***

### **New England Governors and Utility Regulatory and Related Agencies**

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