

Demand Response Issues Facing ISO New England [July 2014]

Circuit Court Overturns FERC Order 745

The D.C. Circuit Court overturned FERC Order 745 on May 23, 2014 in a move that surprised many in the industry. ISO-NE is governed by its FERC tariffs, and the court decision does not immediately impact ISO plans and operations. Actual implementation of market changes will be delayed one year until June 2018. The ISO will move forward on schedule with planning activities currently underway.

Driver: The court order is the outcome of a petition to FERC led by the Electric Power Supply Association based on objections to Demand Response compensation based on locational marginal cost.

Risks: The risk to the ISO is that if FERC Order 745 is not restored it could potentially need to unwind certain rule changes and manage stranded resources.

One risk to market participants is that some portion of settlements based on LMP under existing rules could be subject to refund. There is the additional difficulty of making plans in a time of uncertainty.

Timing: The process will evolve over next 2-5 years.

FERC Order on Forward Capacity Market Performance Incentives

FERC issued an order on May 30, 2014 pertaining to increased incentives for Demand Response that performs during operating reserve challenges. This 'PI order' was in response to competing proposals from the ISO and NEPOOL that were filed with FERC on January 17, 2014. FERC opted for a modified incentive structure with elements of each proposal. The ISO submitted a compliance filing on July 14, 2014 that recommends a base capacity payment determined in the Forward Capacity Market and an additional performance payment that is triggered under shortage events. Additional unresolved questions remain. For example, if a shortage event is called and certain resources are held for reserves then there is a lost opportunity for these resources to earn these the higher incentives.

Driver: The ISO is seeking better performance from Demand Response during shortage events to safeguard reliability.

Risks: The new rule proposes penalties for non-performance during shortage events that will approximately double to \$1,000/MW for 30-minute operating reserves and \$1,500/MWh for 10-minute non-spinning reserves.

Timing: ISO staff will await feedback from FERC on their July 2014 compliance filing. The ISO has additional work ahead to straighten out certain problems.

Reserves Market Planning Continues, Implementation on Hold

Two major design changes are underway at ISO-NE to comply with FERC Order 745 to achieve full market integration. The first design change concerns development of new rules for how Demand Response provides real time reserves and participates in the Forward Capacity Market. Must-bid energy offers will need to include the operational characteristics of resources. This includes fast start capabilities (10-minute, 30-minute), which must be documented with audit data. While the must-bid rule will go into effect in June 2017, the penalty structure for nonperformance (aligning rules for Demand Response with generation) will not be implemented until 2018.

Driver: FERC Order 745.

Risks: If Order 745 is restored by a higher court, the new Reserves Market will significantly change how Demand Response participates in the market.

Timing: ISO staff plan to have market rule changes voted on by the Markets Committee at the September 2014 meeting. This schedule was established to accommodate rule changes in time for FCA #9 in February 2015.

Common Dispatch Model Planning Continues, Implementation on Hold

The second major design change to comply with FERC Order 745 is development of a Common Dispatch Model for Demand Response that does not require a separate generation asset to model net supply in the energy market. A co-optimized market will be set up in a way that designates resources that provide energy and/or reserves, depending on how they are offered into the market. The original rules of the Forward Capacity Market are based on a construct, in which different kinds of assets at a facility are treated as entirely separate. This is problematic with the integration of the Forward Reserve Market because it can result in the wrong number of MWs designated as reserves. Separate assets at a facility were thought to be independent, but this is not always the case. If load is reduced quickly following dispatch instruction, on-site generation is normally unavailable within the first ten minutes, meaning that only one asset can be counted on to quickly ramp up. As a result, previously separate assets will be modeled as one collective asset. The ramp rate will apply to the entire asset (both load and generation). All cleared offers are treated as a demand reduction.

Driver: FERC Order 745.

Risks: If Order 745 is restored by a higher court, the new Reserves Market will significantly change how Demand Response participates in the market.

Timing: ISO staff plan to have market rule changes voted on by the Markets Committee at the September 2014 meeting. This schedule was established to accommodate rule changes in time for FCA #9 in February 2015.

Consolidation of market assets

In compliance with FERC Order 745 the retail delivery point will serve as the basis for calculation of demand reductions. Facilities with both load reduction and distributed generation will be consolidated into one combined asset. Consolidated assets will capture net load (can be negative) at the utility meter. Numerous baseline rules will be changed, including phase out of the Total Facility Load baseline which separately meters generation at sites with active Demand Response.

Driver: FERC Order 745.

Risks: Requires changes in participant baseline methodologies.

Timing It is not entirely clear whether the June 2017 target date for completion of all metering changes will be shifted to June 2018.

Reserve Market

Certain energy market rules need to be modified to allow Demand Response to provide real-time reserves. The ISO will need to define additional offer characteristics for Demand Response to provide reserves. An important concept is 'Claim', as in 'Claim 10' or 'Claim 30'. This represents the ability of a resource to provide 10-minute or 30-minute reserves from an offline (uncommitted) state. These Claim values are demonstrated in an audit. New rules will create offer parameters for how this should be done. ISO staff will also develop new rules for settlement of real-time reserves met by Demand Response.

Driver: Need for accurate designation of asset capabilities to serve as reserves.

Risks: More complicated rules for participants.

Timing: Work underway; Markets Committee vote anticipated in September 2014.

Stricter telemetry requirements

Demand Response currently in the market must provide 5-minute telemetry data. Although this is sufficiently granular for a 30-minute reserve product it will not suffice for a 10-minute reserve product. More frequent telemetry data will be needed to assess a resource's ability to dispatch energy within the designated time frame, and to monitor performance after dispatch. ISO staff believe that one minute telemetry data will provide a better trajectory of the situation in 10-minutes.

Driver: Need for accurate designation of asset capabilities to serve as reserves.

Risks: Cost of required metering of Demand Response assets.

Timing: Markets Committee vote anticipated in September 2014.

Aligning dispatch and reserve zones

With the new Forward Reserves Market, the ISO needs to define new rules for the treatment of demand response resources in dispatch zones that are not yet fully aligned with reserve zones. Because dispatch zones and reserve zones are determined at different times it is possible for a dispatch zone to span more than one reserve zone under the current configuration.

Driver: FERC Order 745 compliance.

Risks: Minimal.

Timing: New rules will be proposed shortly.

Improved baselines to designate reserves

ISO staff are developing a baseline adjustment method to produce a better forecast of a demand resource's baseline energy consumption in real time. The present method adjusts baselines once a day after the operating day is over, which is inadequate for designating reserves. ISO staff are proposing that baselines be adjusted every ten minutes. This frequency, combined with control room access to the adjusted baseline, will give an accurate idea of what can be counted on by location. Once an energy dispatch occurs the adjusted baseline is used to determine performance. Afterwards, the adjusted baseline is again used to assess options to meet reserve requirements.

Driver: Need for accurate designation of asset capabilities to serve as reserves.

Risks: Stricter metering for Demand Response that has the operational characteristics to provide 10-minute reserves.

Timing: Markets Committee vote anticipated in September 2014.

Baseline adjustments for assets that provide net supply to the grid

The majority of assets in the market still cannot inject energy onto the grid, but distributed resources are becoming more commonplace and this is becoming an issue. For traditional Demand Response assets that cannot inject energy, the day-of event adjustments to the baseline could never dip below zero. Market rules specify a floor of zero consumption to ensure this does not happen. However, assets that can inject energy onto the grid may at times be a net supplier of power and have negative 'consumption'. In this case, imposing a baseline floor of zero can result in over-payment of asset performance. The proposed solution is set the floor based on the MWs indicated on the participant's interconnection agreement.

Driver: Improve baseline accuracy and performance measurement.

Risks: Minimal.

Timing: Planning ongoing.

Out-of-Market Winter Reliability Program

The Winter Reliability Program is an out-of-market program originally designed for oil and gas peaker units to address location-specific problems on the network (natural gas constraints, delayed LNG shipments). During the winter of 2013-14 Demand Response was permitted for the first time to participate in this program. This may include Demand Response assets that are mapped to a Forward Capacity Market resource. When dispatches in the program overlap, only the incremental MWs in excess of the Forward Capacity Market obligation apply to the Winter Reliability Program. The program is not aligned with the direction of the market under full integration, yet it serves a short term need for reliability. Interest in the program was low last winter and changes are being proposed to make it more attractive to providers. Most importantly, the \$250/MW penalty for non-performance will be eliminated.

Driver: Need to minimize risk of fuel supply disruption.

Risks: Low interest among providers of Demand Response.

Timing: Program will be continued during winter 2014-15 and subsequent winters.

Scheduled and unscheduled outages

New rules are now in effect to handle scheduled and unscheduled facility curtailments. These new rules will carry over into the new market under full integration. Lead participants must notify the ISO of any outages following the same rules as apply to generators. Participants should not make any offers into the day-ahead energy market and must submit adjustments to their resource availability data. Participants need to submit unadjusted baseline values for any intervals that occur during the outage unless it coincides with an ISO dispatch, in which case actual meter data should be submitted.

Driver: Meter reads during outages that were included in baselines and producing settlement errors.

Risks: Minimal risk.

Timing: New rules went into effect in June 2014.

Baseline accuracy during non-weekday dispatch

A weekend Demand Response dispatch in December 2013 revealed the inadequacy of using a baseline developed from historical non-holiday weekdays. There is a clear need for market rules that anticipate dispatch outside the traditional weekday afternoon. Any solution that is developed will only be relevant through June 2017 when the market is fully integrated and baselines will be required for four day prototype day types.

Driver: Improve baseline accuracy and performance measurement.

Risks: Minimal beyond the need for more baseline types.

Timing: To be determined.

Regulation Market Planning Continues, Implementation Delayed

ISO-NE/NEPOOL jointly submitted market rule revisions to FERC on March 20, 2014 concerning the new Regulation Market being implemented to comply with FERC Order 755. Alternative technologies will be allowed to participate in the new market that includes a capacity price and a service (mileage) price, with offers updated throughout the day. The ISO had anticipated implementing its Regulation Market in May 2014. The delay was ordered by FERC following a protest submitted on April 10, 2014 from Beacon Power and the Electricity Storage Association. The petition argued that the ISO's proposed rule changes discriminated against energy storage and gave preferential treatment to generation.

Driver: Protests filed with FERC to proposed ISO-NE rule changes concerning the new Regulation Market

Risks: Minimal

Timing: FERC has ruled that the new market will not be implemented on May 21, 2014 as previously planned. FERC has not established a new implementation date.

Treatment of passive behind-the-meter resources

The use of passive behind-the-meter generation at customer facilities is growing and the ISO is going to need to develop new rules to address numerous issues. As a start, the ISO has asked Lead Participants to submit information on these resources at the facilities that have assets in the Forward Capacity Market. One issue is that diesel generators can be turned on and off at will and can, therefore, manipulate a Demand Response baseline. Current market rules require Demand Response assets with any behind-the-meter generation to report 5-minute interval data on all generator output to safeguard against such manipulation. This data is expensive to collect. Solar, wind and certain cogeneration that is not controllable should not be subject to this requirement.

Driver: Growing role of passive behind-the-meter generation

Risks: Minimal

Timing: Unspecified

Other Issues

- *Highly Variable Loads.* The ISO is looking for ideas to better manage Demand Response resources with highly variable loads. Baselines are a poor predictor of usage for these assets that estimates of performance can be off by an order of magnitude.
- *Rolling average baseline.* Current use of a rolling average to compute asset baselines creates several problems. One is an 'infinite tail' on the baseline in which old and erroneous reads never completely disappear. The telemetry system is taxed by the requirement that the entire baseline be recalculated and stored as a unique version every time a 5-minute interval is recorded. If the ISO were to adapt the kind of X of Y baseline approached used at other ISOs the problem would

disappear. Consultants performed a recent study of alternative baseline approaches, but the study does not offer compelling conclusions regarding next steps.

- *Simultaneous auditing rules.* There are a couple of issues here. The first concerns rule changes that permit the first hour of Demand Response events to serve as the Demand Response audit. The seasonal audit for emergency generation can be performed at a later date. Performance data for emergency generation will be capped to minimize potential for market manipulation. The proposed rule caps the combined RTEG and RTDR performance data at total load for the facility. In other words, RTEG performance (as measured at the seasonal audit) plus RTDR performance (as measured during the Demand Response event) cannot exceed total facility load. RTEG performance is reduced by the amount of overlap between the two so that the sum is no higher than total load. The second issue is unresolved. This concerns auditing of reserve products in the new market. Stakeholders would like for audits of 10-minute reserve products and 30-minute reserve products to be conducted at the same time as seasonal audits. The ISO is postponing consideration of this issue for the time being.
- *Passive resources.* Energy efficiency is performing better than dispatchable demand response in the Forward Capacity Market. The total MWs of passive demand resources have been rising because of the acceleration of energy efficiency programs and the long lives of these measures. This trend is expected to continue for the next few years. New Real Time Demand Response MWs have been mainly from enrollment in the Transitional Price Responsive Demand program for resources that can meet certain criteria for full integration such as the ability to make day-ahead offers in the energy market. A second issue concerns evidence that utilities are taking conservative market positions with their passive resources in the Forward Capacity Market. These MWs almost always materialize, often ahead of schedule, and have performance that typically meets or exceeds ISO expectations (unlike dispatchable Demand Response).
- *Voluntary Load Reductions.* There are two problems with the way the ISO handles voluntary load reductions. First, the ISO does not have a satisfactory system in place for making decisions about when to call for these reductions or communicating this information. Second, voluntary Demand Response can be harmful for market participants with dispatchable assets that respond to pleas to reduce load ahead of the curtailment period. Metered data in these pre- event hours is used to adjust customer baselines. A downward adjustment reduces measured performance and settlements.

- *Better Participant Data.* The ISO has been working participants to update information on its demand resource assets. One issue is that a number of assets appear to have on-site generation that the ISO is not aware of. For behind-the-meter generation that can push back to the grid, a revised lower baseline cap will be created based on the MWs in the interconnection agreement. A separate problem is that many assets have taken on capacity supply obligations that are far in excess of actual performance during audits and Demand Response events because CSO information has not been updated in a long time.
- *Capacity shortfall in recent Forward Capacity Market.* The Forward Capacity Market experienced its first capacity shortfall in February 2014 and higher market clearing prices. Gordon Van Wellie said, “*The slim capacity margin and resulting auction prices are a clear signal to the marketplace that the region needs more power generation and demand reduction capability.*”