

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

Frequency Regulation Compensation in            )  
Organized Wholesale Electric Markets        )        Docket No. AD10-11-000

**COMMENTS OF THE ELECTRIC POWER SUPPLY ASSOCIATION**

The Electric Power Supply Association<sup>1</sup> (EPSA) submits these comments in response to the Federal Energy Regulatory Commission's (FERC or Commission) May 27, 2010 Notice establishing a date for comments in response to the May 26, 2010 technical conference in the above captioned proceeding.<sup>2</sup> The May 26 technical conference focused on two issues: (i) the assertion that new storage technologies respond more quickly to dispatch signals; and, (ii) existing pricing and potential reforms for regulation services.

EPSA appreciates the Commission's reliance on the May 26 technical conference and May 27 notice requesting comments to develop a record on this issue. Competitive suppliers are significant regulation market participants and regulation service providers, and therefore have a significant interest in the evolution of the regulation service market and contemplated compensation changes for those markets. Consequently, as the primary providers of existing

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<sup>1</sup> EPSA is the national trade association representing competitive power suppliers, including generators and marketers. These suppliers, who account for 40 percent of the installed generating capacity in the United States, provide reliable and competitively priced electricity from environmentally responsible facilities. EPSA seeks to bring the benefits of competition to all power customers. The comments contained in this filing represent the position of EPSA as an organization, but not necessarily the views of any particular member with respect to any issue.

<sup>2</sup> *Notice establishing date for comments re Frequency Regulation Compensation Organized Wholesale Electric Markets*, Docket No. AD10-11 (May, 27, 2010).

frequency regulation services, the opportunity to contribute to the record is important to competitive generators.

The technical conference panelists' recommendations suggest that regulation service is ripe for assessment and can allow organized markets to make improvements to this important service as technologies and information systems that track the service evolve. The conference made clear that a balance of new and existing regulation service providers is needed for optimal electrical system performance. Achieving that balance will require further study so that new technologies' speed and accuracy can be better measured. EPSA submits that ISOs and RTOs should be permitted to evaluate these technologies to establish an adequate record of measured performance for new technologies, in addition to better measurements for existing resources' speed, accuracy and duration contribution, before establishing whether any particular resource type should be treated differently, or establishing a new tier of regulation service market.

The conference also highlighted how changes to existing protocols will need to include better recognition for the service and the associated costs for the provision of traditional regulation service. Generators' opportunity costs for regulation service require better market signals to establish whether the value of the generators' output is greater for regulation or energy. Only through the appropriate signals can generators assess how their output can best support both ancillary and energy markets.

## I. COMMUNICATIONS

All pleadings, correspondence and other communications concerning this proceeding should be directed to:

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## II. COMMENTS

As an ancillary service, regulation service is often considered a “traditional” service as system operators have traditionally controlled area control error and maintained frequency through system balancing through automatic generation control; however, the conference record demonstrates that the market for this service is in a constant state of change as organized markets evolve and innovate. The conference highlighted how the frequency regulation markets have been affected by evaluating the use of different types of generators (hydro versus steam),<sup>3</sup> influenced by the changes in the price of fuel (natural gas),<sup>4</sup> and the consolidation of control areas into a single balancing authority.<sup>5</sup> The Commission rightly recognizes that going forward the regulation service market will be influenced by new technologies and the addition of renewable resources to the electric grid.

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<sup>3</sup> Transcript, p. 85, lines 12-14 (Ott).

<sup>4</sup> Transcript, p. 59, lines 19-23 (Lowell).

<sup>5</sup> Transcript, p. 57, lines 14-18 (Lowell).

There are complex challenges that will need to be examined to facilitate efficient changes to the regulation service market. First, new technologies are varied<sup>6</sup> and further research and proven results are needed before significant market changes can be justified, particularly any changes deemed necessary to apply uniquely to any new technology. Second, some new technologies may be capable of faster ramp direction changes<sup>7</sup> or more precise response than some existing technologies but there remain questions about sustainability and the incremental value of the further precision. Third, the existing service can be changed to better accommodate traditional generators as well as new technologies through co-optimization. Herein, EPSA provides comments on these three conference issues.

#### **A. FURTHER RESEARCH IS REQUIRED PRIOR TO CHANGING MARKET PROTOCOLS FOR NEW TECHNOLOGIES**

Currently, new technologies such as flywheels and storage devices have shown promise but have only been tested on a small scale; there is little significant data available regarding their performance. Additionally, due to variations in size and design of new technologies, their resultant contribution to the overall regulation market is difficult to measure. For example, PJM Interconnection's Andy Ott noted that the RTO's experience with new

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<sup>6</sup> Transcript, p. 16, lines 20-23 (Walawakar).

<sup>7</sup> While a new technology may provide more ramp rate per unit size or the ability to switch quickly from ramp up to ramp down, it remains unclear whether this performance provides better regulation service to meet system balancing needs. Unless system conditions require frequent reversals in ramp direction, some technologies may have difficulty in sustaining ramp performance. Further, it is unclear whether very fast change in direction under any new technology is more useful to ISO/RTO regulation control than the sustainable fast ramping of traditional technologies.

technologies is solely associated with a 1 MW storage unit that plays a small part in the overall PJM regulation market.<sup>8</sup>

While it was accepted that some new technologies can respond to operators in a very accurate and fast manner, it was also noted that many existing generating facilities such as traditional hydro and pumped storage resources can also respond very quickly.<sup>9</sup> Given that traditional fast responding resources typically are of large size and that this higher capacity gives them the ability to respond to the signal for a longer period of time, specific consideration of traditional resources should not be overshadowed by new technologies. Consequently, further studies of new technologies should at a minimum measure them on par with traditional resources.

As more new technologies become integrated into the electric grid, greater data on their impact will yield information that can attest to the overall benefit the technologies provide for regulation service. The current pilot program being conducted by the New England Independent System Operator (ISO-NE) should serve as a stepping stone in developing better data for assessing regulation service market changes. At the conference Jonathan Lowell of the ISO-NE addressed the need for more data before sweeping changes could be contemplated:

I couldn't get away from the feeling that we did several years of data with a number of different resources before you could really do anything other than make speculative guesses, on quantifying it. I think we may be able to determine trends, but I think it would be awful hard to get a credible

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<sup>8</sup> Transcript, p. 14-15, lines 24-25, (Ott).

<sup>9</sup> Transcript, p. 16, lines 10-12 (Potishnak).

quantified number without more experience, which is part of the reason we did the pilot program that we have now, so we can get that experience.<sup>10</sup>

Therefore, while existing data is being established, further data needs to be collected so that the material impact of new technologies can be adequately assessed.

The primary supporting data for new technologies regarding the trade off between speed and accuracy was provided by Beacon Power for its flywheel technology at the conference. This technology is promising, but EPSC would caution the Commission against approving any regulation market changes based solely on the claims by those who will benefit from the penetration of their product, rather than data from independent sources, and before it is clear that any uniquely different performance provides greater value to ISO/RTO regulation control than certain traditional technologies. Data supporting the qualities and benefits of new technologies needs to be assessed independently to demonstrate how integration and growth can be accomplished in a manageable way to benefit the overall efficient operation of the grid and, ultimately, electricity customers.

## **B. REGULATION RESOURCES NEED TO BE SUSTAINABLE AS WELL AS FAST AND ACCURATE**

It was generally agreed by conference panelists that regulation service needs to be provided on a sustainable basis. While the importance of the speed of the service and the ability of the resource to follow the system operator's

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<sup>10</sup> Transcript, p. 60, lines 15-24 (Lowell).

signal accurately were important, being able to sustain that signal for a period of time was also deemed important.<sup>11</sup>

Sustaining the system can depend on the technology used and how much that technology is relied upon for regulation by any given balancing authority. System operators asserted that an over-reliance on new technologies could make sustaining regulation in times of system contingencies problematic. Mr. Potishnak detailed this scenario at the conference:

I think that Bill Capp showed about 82 percent effectiveness compared to the ideal is quite accurate when you are in the friendly scenarios. What we are wrestling at ISO New England with is what happens with the other 18 percent of the time. The one scenario that concerns us, and we're all still thinking this through, but supposing all of our regulation resources were of these high-speed but short storage, low storage, characteristics and we were, say, under generating for a few minutes where these storage devices were spun down.

They have been acting as sources for quite a while. Then, we incur a large loss of generation with a disturbance control standard event. We lose, say, Seabrook at 1,200 megawatts or something like that. These resources would help out, would be sustaining where they are for a while. During that recovery period if they run out of energy, they may amplify the size of that contingency. Now instead of having to recover for Seabrook, we have to recover for the loss of those short-term resources being depleted during that period.<sup>12</sup>

Because new technologies not only provide regulation to the grid but also need the system to repower, there is still a strong need for traditional resources to provide a significant portion of regulation service. Often sustained performance is needed to keep the system operating reliably.

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<sup>11</sup> Transcript, p. 14-15, lines 24-25, (Ott).

<sup>12</sup> Transcript, p. 29, lines 13-25 and p. 30, lines 1-11 (Potishnak).

Conference participants also agreed that over-reliance on new technologies could initially lower the cost of regulation service, but there is a level at which there will be diminishing returns from these potentially lower costs. As was described by Todd Ramey of the Midwest ISO:

My perspective on this question of the potential to continue to lower the cost of providing regulation service by introduction of more and more faster sponsor resources is I think there is limited potential once you reach a certain level of capacity that you are procuring.<sup>13</sup>

Consequently, any lowering of costs by new technologies will require a balance of cost consideration for both new and existing resources. The potential for lowering the cost of regulation will need to consider and be based on the incremental cost of providing regulation for both traditional resources and new technologies.

### **C. CO-OPTIMIZATION OF EXISTING AND NEW RESOURCES WILL PROVIDE PROPER MARKET SIGNALS FOR EFFICIENT REGULATION SERVICES**

There are various factors that need to be considered for controlling area control error through frequency regulation markets so that an optimum balance of new and existing resources can be achieved. Measures of these factors need to be taken so that appropriate protocols can be established in each of the organized markets. Otherwise, some existing resources will not be used in the most efficient manner. This was addressed by Jonathan Lowell of the ISO-NE at the conference:

It could push some of the thermal generation that today provides regulation to New England out of the market. That won't be their best use.

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<sup>13</sup> Transcript, p. 18, lines 20-25 (Ramey).

I don't know that it would push it all out. There are multiple dimensions to managing your area control error.<sup>14</sup>

Therefore, the ISO/RTO's assessment of resources must include both existing and new resources and provide incentives that will achieve the appropriate balance among all resources for the appropriate mix of resources for regulation service.

At the conference the ISO/RTO representatives all detailed the regulation protocols and incentives being contemplated in their markets at the conference. While each regulation market's design is slightly different, each seeks to co-optimize new and existing resources in the most efficient manner to ensure the best performance and, hence, lower costs for their energy and regulation markets. As noted by Andy Ott of PJM and Todd Ramey of the Midwest ISO:

In a market design that includes co-optimization of the available offers to provide competing services, energy regulation or spin, that can be co-optimized and managed on a very short time frame across the fleet maybe on a 5-minute basis, you are capturing a lot of the value of getting the right megawatts in the right places, providing the right resources. You can capture a lot of that value through available market designs that are out there today.<sup>15</sup> (Ott)

Just in terms of design choices, I think co-optimization of capacity for energy and ancillaries is the right direction for us to head in. Midwest ISO uses co-optimization. At the unit level or asset-owner level, there is no real choice about which products their capacity is being requested to provide. They are cleared in such a manner and priced in such a manner that they are ultimately indifferent to whether they are providing using their capacity to provide energy regulation or spin.<sup>16</sup> (Ramey)

Going forward co-optimization and how that is evaluated will be important to generation resources because the rules that result will play an important role in

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<sup>14</sup> Transcript, p. 20, lines 19-21 (Lowell).

<sup>15</sup> Transcript, p. 38-39, lines 25 and 1-9 (Ott).

<sup>16</sup> Transcript, p. 73, lines 13-25 (Ramey).

determining whether and when the resource will provide energy or ancillary services. Much as the conference illuminated the need for further measurement for new technologies, it also demonstrated that organized markets have other measures that need to be assessed to better value existing resources' contributions to ancillary markets. For example, ramping times for existing generation needs to be improved, as highlighted to by Todd Ramey of the Midwest ISO:

That is another area where there could be some improvements in the algorithms to directly determine a requirement for ramp, have that as an input either from the operator saying, "This is what I need" and the algorithms providing it, or probably a preferable approach would be to have some sort of market mechanism that says, "The value of this much ramp is 'X,'" and it is cleared and compensated directly.<sup>17</sup>

Consequently, better measurement of ramping needs, and compensating for it adequately, will better inform generators decisions about providing ancillary services versus energy to the system.

### **III. CONCLUSION**

Wherefore, EPSA respectfully requests that the Commission adopt the recommendations herein by promoting greater measurement and research for new frequency response technologies, so that any market changes consider the value of existing resources on par with new technologies. In addition, the Commission should consider market changes that appropriately measure and balance the sustainability of all regulation service resources so that they can be co-optimized in market protocols. This will facilitate efficient decisions for

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<sup>17</sup> Transcript, p. 75, lines 5-13 (Ramey).

generators regarding the provision of regulation service or energy and result in a reliable, efficient electricity system.

Respectfully Submitted,



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**CERTIFICATE OF SERVICE**

I hereby certify that I have served a copy of the Comments via email upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C. June 16, 2010.



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Nancy Bagot, VP of Regulatory Affairs