

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

Third-Party Provision of Primary Frequency)	Docket No. RM15-2-000
Response Service)	
)	

**COMMENTS OF THE
INDEPENDENT MARKET MONITOR FOR PJM**

Pursuant to a notice of proposed rulemaking issued February 19, 2015 (“NOPR”), Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM (“Market Monitor”), submits these comments on the Commission’s proposal to amend its regulations to permit the sale of primary frequency response service at market-based rates by sellers with market-based rate authority for energy and capacity.¹

I. COMMENTS

A. The Commission Foresees a Need for a Primary Frequency Response Market to Procure Primary Frequency Response for RTOs to Meet the Newly Approved BAAL Requirement.

In its NOPR (at P 2), the Commission has proposed reforms to ancillary service markets “in anticipation of the potential interest in purchase of primary frequency response service from third-parties as a result of a new reliability standard that requires a Balancing Authority to maintain a minimum frequency response obligation.” The Commission, on January 16, 2014, issued a Final Rule approving reliability standard BAL–003–1 under

¹ See *Third-Party Provision of Primary Frequency Response Service*, Notice of Proposed Rulemaking (NOPR), 150 FERC ¶ 61,092 (2015).

which a Balancing Authority must maintain a minimum frequency response obligation.² Based on this new standard, the Commission anticipates that there may be interest in purchasing, rather than self-supplying, primary frequency response service from third parties if doing so would be economically beneficial.³ The Commission concluded that there could be interest in the near future in voluntary sale and purchase of a primary frequency response product.⁴ To support this potential interest, the Commission, in its NOPR, “proposes to revise its regulations to foster competition in the sale of primary frequency response service.”⁵

B. The Commission Distinguishes Regulation and Primary Frequency Response Service.

The Commission notes (at P 18) that while, in Order No. 888, it “found that primary frequency response did not merit a separate ancillary service given then-standard industry practices,” the Commission now “preliminarily find that we can distinguish between primary frequency response and regulation for the purposes of considering how the transmission provider may procure the services it must offer under OATT Schedule 3.” The Commission notes (at P 11) that, though they can distinguish between the two, both are needed for the provision of frequency control.

The Commission notes (at P 12) that “primary frequency response involves the autonomous, automatic, and rapid action of a generator, or other resource, to change its output (within seconds) to rapidly dampen large changes in frequency.” The Commission notes (at P 12) that “[r]egulation, also known as secondary frequency response, is produced from either manual or automated dispatch from a centralized control system, generally

² NOPR at 8.

³ *Id.*

⁴ *Id.*

⁵ *Id.*

using the communications and control system known as automatic generation control (AGC).” The Commission states (at P 12) “that in both cases, capacity must be set aside to provide the responses described above.”

The Commission states (at P 1 n.1), “[a]s envisioned in this NOPR, primary frequency response service would be a reserve product that involves dedicating capacity on a generator or other resource for autonomous, automatic, and rapid action to change its output (within seconds) to rapidly dampen large changes in frequency.”

C. PJM Currently Has Sufficient Resources to Achieve the Newly Approved BAAL Requirement.

PJM’s current resource mix and interconnection requirements permit PJM to meet the BAL standard and there is no current reason to believe that there will be a shortfall in frequency response capability in the foreseeable future.

PJM’s data indicate that it will be able meet the NERC BAL standard using the primary frequency response capability of its existing generators.⁶ With the exception of an extreme weather related shortage event in January 2014, PJM met its internal (more strict than NERC) BAAL performance requirements from January 2011 through February 2015, the period covering BAAL field testing.⁷ PJM met the NERC BAAL requirement over the entire field test period.

D. PJM Currently Has a Mechanism for the Provision of Primary Frequency Response Capability.

In PJM, primary frequency response is provided automatically by on line generators via their governor response to frequency deviations.

⁶ See Reports to the PJM Operating Committee Meeting, which can be accessed at: <<http://www.pjm.com/committees-and-groups/committees/oc.aspx>>.

⁷ See PJM 2014 State of the Market Report, Appendix F. See also Reports to the PJM Operating Committee Meeting: <<http://www.pjm.com/committees-and-groups/committees/oc.aspx>>.

The provision of primary frequency response during operating hours is a requirement for generators larger than 20 MW to participate in PJM markets. PJM requires that generators larger than 20 MW have and operate “on unrestricted governor control to assist in maintaining interconnection frequency, except for the period immediately before being removed from service and immediately after being placed in service.”⁸

Regulation is one part of the resources available to control Area Control Error (ACE), which is comprised of system imbalance and the frequency deviation contribution to system imbalance. The goal of ACE control is to maintain power balance and interconnection frequency within predefined MW and frequency profiles under all conditions (normal and abnormal). The PJM Manuals define ACE and the methodology for calculating it:

Area Control Error is a measure of the imbalance between sources of power and uses of power within the PJM RTO. This imbalance is calculated indirectly as the difference between scheduled and actual net interchange, plus the frequency bias contribution to yield ACE in megawatts.⁹

The Commission notes (at P 25) that one of the reasons for having primary frequency control in addition to regulation service is that there are complementary characteristics to the two sources of frequency response in terms of the ability to respond to frequency deviations. The Commission states (at P 38) that, in response to a significant frequency deviation, primary frequency response resources “will automatically and autonomously begin to respond within fractions of a second to try to arrest the deviation in frequency.” Where this response is insufficient to correct the frequency deviation, within two–six seconds a “Balancing Authority’s AGC system will begin issuing dispatch instructions to regulation resources to try to reverse the deviation in frequency and return the

⁸ PJM Manual 14D § 7.1.1

⁹ PJM Manual 12 (Balancing Operations) § 3.1.1 at 12.

interconnection-wide system frequency to 60Hz.”¹⁰ The Commission notes that “regulation resources, depending upon their ramping capabilities, may take up to 10 minutes or so to reach their full dispatched levels.”¹¹ Once fully dispatched, the regulation resources “should have fully displaced the autonomous primary frequency response resources that initially reacted to slow and arrest the frequency deviation.”¹²

AGC dispatch and Distributed Control System (DSC) autonomous responses to frequency deviations provide complementary contributions to frequency control. However, PJM has the additional feature that its regulation service responds in less than or equal to five minutes. PJM’s regulation market uses a combination of fast signal following (RegD) and traditional signal following (RegA) resources to correct for ACE.

RegA is PJM’s slow regulation signal designed for resources with the ability to sustain increases or decreases in energy output for longer periods of time, but with response times up to five minutes. RegD is PJM’s fast regulation signal designed for resources with faster response times, but with limited ability to sustain increases or decreases in energy output for longer periods of time. The regulation signals (RegA or RegD) are sent every two seconds to regulation resources.¹³ Regulation resources report to PJM every two seconds the response to the RegA and RegD signals.

If the current design issues with PJM’s Regulation market were corrected, the PJM regulation market, with its mix of RegA and RegD resources, would enhance PJM’s

¹⁰ NOPR at P 24 n.38.

¹¹ *Id.*

¹² *Id.*

¹³ See PJM Manual 12 (Balancing Operations) at 9.

performance relative to BAAL requirements.¹⁴ While regulation does not provide primary frequency response, the contribution of fast response regulation to secondary frequency response should be accounted for in the design of a market for primary frequency response.

E. Current Expected BAAL Performance Does Not Preclude a Future Need for a Primary Frequency Control Market.

PJM currently has adequate primary frequency control resources, a regulation market and a synchronized reserve market that will allow it to meet the BAAL requirements. But this does not mean that PJM should not develop a market for primary frequency control if there are additional sources of primary frequency response that are not compensated under the current design, if it is possible that PJM will need additional sources of primary frequency response, or if it would be more efficient to break out the payments and revenues for the service. The capacity and maintenance costs of primary frequency control are part of the CONE unit design in the capacity market and are expected to be covered through PJM's capacity markets, and the incremental costs of primary frequency response are expected to be zero, although there may be positive opportunity costs. As a result, the market clearing price for primary frequency response is expected to be zero or equal to the opportunity cost, if any, of the marginal unit.

Balancing Authorities are responsible, under NERC rules, for maintaining ACE and meeting BAL standards. While the frequency of the entire Eastern Interconnection depends on and is affected by all units with governors, it is also the case that the balance between load and generation depends on all load and generation in the entire Eastern Interconnection. Each RTO Balancing Authority maintains an independent energy market to ensure a balance between load and generation. It would, similarly, be, an effective structure for managing frequency to require each RTO Balancing Authority to address

¹⁴ See the 2014 State of the Market Report for PJM (March 12, 2015) at 375; Problem statement to PJM Operating Committee dated April 7, 2015, which can be accessed at: <http://www.pjm.com/committees-and-groups/committees/oc.aspx>.

primary frequency control independently. PJM should develop a standalone market for primary frequency control if such a market is necessary to help ensure adequate supply. That market could accept offers of primary frequency control from any qualifying resource.

The NOPR discusses the screens used to analyze market power in connection with authorization to charge market-based rates. Market based rates are typically authorized to participants in PJM and other organized wholesale markets based in significant part on the market power mitigation rules of the RTO. Accordingly, the Market Monitor recommends that, if a market is developed in PJM for primary frequency response, the rules incorporate the three pivotal supplier test. The three pivotal supplier test is an automatic, real time test for structural market power used in PJM's other markets.¹⁵

If the Commission requires further investigation of these issues for the PJM market, a constructive approach would be to direct PJM and the Market Monitor to evaluate the details of implementing a market in primary frequency response, including the balance between supply and demand, the role of fast response regulation, the expected clearing prices and potential market power issues, and on that basis determine whether to direct PJM to implement such a market.

¹⁵ See PJM Operating Agreement Schedule 1 §§ 3.2.2A.1, 6.4.1; OATT Attachment DD § 6.3.

II. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to these comments as the Commission resolves the issues raised in this proceeding.

Respectfully submitted,



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