UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Essential Reliability Services and the	**)**	
Evolving Bulk-Power System—	**)**	**Docket No. RM16-6-000**
Primary Frequency Response	**)**	

COMMENTS OF THE ENERGY STORAGE ASSOCIATION

The Energy Storage Association ("ESA") submits these Comments in response to the notice of proposed rule issued on November 17, 2016 pertaining to above-captioned docket. While ESA does not oppose the requirement of primary frequency ("PFR") response *capability* as a condition of interconnection, it is critical that FERC refrain from mandating a PFR *provision*. As detailed herein, mandating provision of PFR would create undue or discriminatory burdens on electric storage resources. Accordingly, ESA respectfully asks FERC to modify its proposal and direct RTOs/ISOs to make provision of primary frequency response a compensated service.

I. COMMUNICATIONS

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II. ABOUT THE ENERGY STORAGE ASSOCIATION

Since its inception 27 years ago, the ESA has promoted the development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers. ESA's membership comprises a diverse group of electric sector stakeholders, including utilities, independent power producers, manufacturers of advanced technologies -- such as batteries, flywheels, thermal energy storage, compressed air energy storage, supercapacitors, and other technologies -- component suppliers, and system integrators.

ESA's nearly 200 member companies have expertise in transmission- and distribution-level grid operations relevant to energy storage, as well as firsthand knowledge of the regulatory challenges to financing and operating commercial energy storage facilities to realize full system benefits.

III. COMMENTS

1. *While ESA does not oppose FERC's requirement of primary frequency response capability as a condition of interconnection, it is critical that FERC refrain from mandating PFR provision.*

ESA agrees with FERC that reservation of headroom for the provision of PFR should not be required. ESA interprets the following proposed tariff language as an explicit prohibition against requiring reserving headroom as a condition of interconnection:

> "Nothing in Sections 9.6.4, 9.6.4.1 and 9.6.4.2 shall require the Large Generating Facility to operate above its minimum operating limit or below its maximum operating limit, or otherwise alter its dispatch to have headroom to provide primary frequency response."

Additionally, ESA interprets the following proposed tariff language to mean that generating unit operations shall not be required to modify expected operations as a condition of interconnection:

> "…if a generating facility that is subject to these proposed requirements has been dispatched by its balancing authority to a set-point at which there is no available operating range to increase or decrease its output in response to frequency deviations, it would not be in violation of the proposed requirements in regards to providing sustained response..."

In its Final Order, ESA respectfully requests that FERC not mandate the provision of PFR service.

2. Requirements of interconnecting resources to provide primary frequency response capability should accommodate the unique technical attributes of electric storage to avoid undue or discriminatory burdens on electric storage resources.

FERC proposes to require a governor or equivalent controls capable of providing PFR capability as a condition of interconnection. ESA agrees with FERC that interconnection should provide the option for "equivalent controls," as governors are inappropriate for advanced electric storage, such as batteries, which do not have the physical characteristics of traditional generators or pumped hydro storage.

However, FERC's proposals do not adequately address other differences between electric storage and traditional generators. FERC proposes to require that unit controls be operated to provide PFR service based on nameplate capability. PFR is provided by traditional generators on the proportion of their nameplate capacity above minimum set point for physical operations. For example, if a 100 MW unit has a minimum set point of 40 MW, then PFR service will be based on the 60 MW of capacity above that minimum set point. However, energy storage has no minimum set point and is capable of operating at the full range of its capacity (*i.e.*, down to 0 MW), including in capacity for withdrawals and for injections. Furthermore, different electric storage technologies have different optimal depths of discharge, and exceedance of optimal depth of discharge accelerates unit degradation and increases operations & maintenance costs. Thus, even despite a lack of minimum set point for electric storage, there is nevertheless a

disproportionate impact in using nameplate capacity at the basis for PFR provision. At the same time, whereas generating units start-up and shut-down as a part of normal operations and are not required to provide PFR service while offline, electric storage resources are "always online" even when not charging or discharging to the grid.

Thus, by specifying PFR capability requirements based on nameplate capacity, FERC's proposal, if then converted into PFR service requirements by either future FERC or RTO/ISO action, would require more frequent and greater magnitude of PFR service from energy storage than from traditional generation of equal nameplate capacity. Since PFR provision is not required to be compensated, FERC's proposals, despite focusing only on PFR capability, could pose a disproportionate adverse economic impact on storage, and thus be discriminatory, should the way in which capability is specified determine the manner of PFR service provision.

Additionally, electric storage is energy-limited, unlike traditional generators that are fuel-based and can sustain output for an unlimited duration. While storage is fully capable of providing the response and ramp capabilities for PFR service, an open-ended requirement to sustain output following a frequency deviation poses unique liabilities (*e.g.*, NERC violations and lost revenues in future intervals) to electric storage. This is particularly true in the instance that storage is called upon to provide injections for PFR at a moment when it is at a particularly low state of charge, subsequent to the provision of energy or ancillary services. Again, because PFR provision is uncompensated, creating this requirement for electric storage may produce disproportionate adverse economic impacts on storage compared to traditional generation by limiting storage from other service provision to conform to PFR requirements as a condition of interconnection.

In light of these differences, ESA respectfully requests that FERC modify its proposals to accommodate the unique technical attributes of advanced electric storage resources, which lack minimum set points of traditional generation and are energy-limited. Thus, ESA recommends that FERC: 1) allow electric storage resources to specify a given unit's minimum set point for the purposes of PFR capability as a condition of interconnection; and 2) include inadequate state of charge as an explicit operational constraint excepting storage from sustained output, specified in the proposed tariff language of Section 9.6.4.2.

Absent these changes to accommodate technical differences between advanced electric storage and traditional generators, ESA respectfully requests that FERC exempt electric storage resources from the requirement to provide PFR capability as a condition of interconnection, similar to the exemption FERC proposes to provide for nuclear power generation.

3. ESA respectfully requests FERC exempt surplus interconnection service from proposed PFR requirements.

In Docket RM17-8-000 issued on December 15, 2016,[1] FERC proposes to make available new forms of interconnection service at existing points of interconnection, *i.e.*, where a generating facility is already interconnected. These proposals include use of surplus interconnection service, which is intended to maximize the use of existing interconnection service capacity and concern generating facilities that are existing interconnection customers. As such, these forms of interconnection should not be considered "new interconnection" for the purposes of PFR capability requirements. Therefore, ESA respectfully recommends that FERC exempt surplus interconnection services, as described in RM17-8-000, from its proposed PFR requirements.

[1] *Reform of Generator Interconnection Procedures and Agreements*, Docket No. RM17-8-000, 157 FERC ¶ 61,212.

4. ESA respectfully requests FERC to direct RTOs/ISOs to provide compensation for PFR service based on the pay-for-performance principle established in Order 755.

As discussed in greater depth in ESA's previous comments, a compensation mechanism for PFR service ensures that resources recover costs caused by the real-time provision of PFR service. ESA recommends the use of a market price mechanism for doing so, as the market clearing price for the service would be based on the marginal cost of the selected resource that faced the highest marginal cost for providing PFR service, ensuring maximal economic efficiency and just and reasonable rates.

Moreover, ESA recommends that FERC direct RTOs/ISOs to use pay-for-performance principles to price PFR provision. Higher-performing, fast frequency response resources provide greater system benefits than slower frequency response resources precisely because they reduce overall frequency response service needed.[2] Additionally, studies have pointed out structural disincentives to generators for the provision of frequency response,[3] suggesting suboptimal service provision even in a compliance framework. A more reliable system for ensuring adequate frequency response performance would provide incentives to market participants to meet high performance. In Order 755, the Commission found that frequency regulation compensation practices that do not compensate performance result in rates that are unjust, unreasonable, and

[2] See page 10 of S. Newell et al. "Cost-Benefit Analysis of ERCOT's Future Ancillary Services (FAS) Proposal." Prepared by the Brattle Group for ERCOT. Dec 21, 2015. Available at http://www.brattle.com/system/news/pdfs/000/000/982/original/Cost-Benefit_Analysis_of_ERCOT's_Future_Ancillary_Services_%28FAS%29_Proposal.pdf?1450901946. See also ERCOT Staff's "Future Ancillary Service Team (FAST) and Technical Advisory Committee (TAC) Workshop #2" presentation to the ERCOT Technical Advisory Committee on Aug 25, 2014, available at http://www.ercot.com/content/meetings/fast/keydocs/2014/0825/FAST-TAC%208-25-14%20Workshop.ppt and ERCOT Future Ancillary Service Team's "Primary Frequency Response (PFR) / Fast Frequency Response (FFR) Assessment" presentation on Mar 28, 2014, available at http://www.ercot.com/content/meetings/fast/keydocs/2014/0328/PFR_FFR%20Assessment_FASTworkshop_03282014.pdf

[3] E. Ela et al. "Alternative Approaches for Incentivizing the Frequency Responsive Reserve Ancillary Service." National Renewable Energy Laboratory TP-5500-54393. March 2012. Available at http://www.nrel.gov/docs/fy12osti/54393.pdf

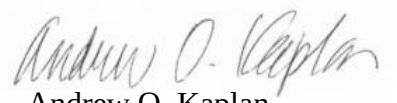
unduly discriminatory or preferential.[4] ESA submits that the same argument applies to frequency response compensation and respectfully requests that FERC establish a pay-for-performance principle with respect to frequency response service compensation.

V. CONCLUSION

Electric storage resources are capable of providing PFR effectively, provided that it is a compensated service. ESA does not oppose FERC's proposal to make PFR *capability* an uncompensated condition of new interconnection. However, ESA is concerned that FERC's specification of that capability may present unique burdens to advanced electric storage resources should PFR service then be required as an uncompensated service by either FERC or RTOs/ISOs. Thus, ESA respectfully requests that FERC modify its proposal to accommodate the technical attributes of electric storage resources and avoid undue or discriminatory burdens on storage that will otherwise occur.

Respectfully submitted,

ENERGY STORAGE ASSOCIATION
By its attorney,



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[4] *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, 137 FERC 61,064 at P 2.

CERTIFICATE OF SERVICE

I, Anne O'Hanlon, hereby certify that the foregoing Comments were served via electronic mail to the service list.

Dated in Boston, MA this 24th day of January 2017.

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