UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

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

COMMENTS OF THE AMERICAN PUBLIC POWER ASSOCIATION, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION, AND TRANSMISSION ACCESS POLICY STUDY GROUP

On February 19, 2015, the Commission issued a Notice of Proposed Rulemaking ("NOPR") that would allow sellers with market-based rate ("MBR") authority for energy and capacity to also sell primary frequency response service at market-based rates to public utility transmission providers.[1] The American Public Power Association ("APPA"), the National Rural Electric Cooperative Association ("NRECA"), and the Transmission Access Policy Study Group ("TAPS") appreciate the opportunity to comment on this proposal. While we share the Commission's goal of fostering the provision of needed frequency response, we are concerned that the highly technical findings on which the NOPR rests require additional evidence and analysis to ensure that reliance on the competitive screens used for sales of energy and capacity will ensure that sellers of frequency response lack market power. As a result, the NOPR may not produce the just and reasonable rates the Federal Power Act requires, and may create other unintended consequences for the availability and cost of transmission and the efficiency of markets.

[1] Third-Party Provision of Primary Frequency Response Service, 80 Fed. Reg. 10,426 (proposed Feb. 26, 2015) (to be codified at 18 C.F.R. pt. 35) ("NOPR").

Specifically, APPA, NRECA, and TAPS urge the Commission to further examine the basis for several key findings that the NOPR relies on to support its proposal to use MBR screens used for energy and capacity sales to ensure that sellers of primary frequency response service lack market power when making sales to public utility transmission providers:

- "[P]rimary frequency response service can be effectively supplied by any resource throughout an interconnection and have the same ability to dampen harmful changes in interconnection-wide frequency." NOPR P 23. This finding, on which the NOPR relies to conclude that the geographic market for the primary frequency response product could be the entire interconnection, or in any case no smaller than that used in the existing screens, needs to be further evaluated, taking into account technical studies showing distantly provided primary frequency response to be less effective in dampening changes.

- "[T]elemetry sharing should not pose any significant barrier to the use of remote resources for the purposes of market-based rates." NOPR P 25 n.39. This finding, which is key to the assumption that sales of frequency response can be considered similar to sales of energy for MBR purposes, needs further technical evaluation, including as to the impact of CIP standards.

- Transmission poses no barrier to remote provision of primary frequency response because scheduling and reserving transmission is unnecessary. NOPR PP 24-25. This finding fails to consider the potential implications of this usage on the amount of transmission that would need to be set aside as Transmission Reserve Margin ("TRM") and the resulting reduction in the Available Transfer Capacity ("ATC"), as well as how the resulting set aside will impact cooptimization of energy and ancillary services in the organized markets.

APPA, NRECA, and TAPS urge the Commission to probe more thoroughly (through additional technical conferences or other avenues) and provide additional analysis on these three complex issues, and allow further opportunity for public comment.

INTEREST OF APPA, NRECA, AND TAPS

APPA is the national service organization representing the interest of not-for-profit, publicly-owned electric utilities throughout the United States. More than 2,000

public power systems provide over 15 percent of all kilowatt-hour sales to ultimate customers and serve over 48 million people, doing business in every state except Hawaii. Public power systems own approximately 10.3% of the total installed generating capacity in the United States.

NRECA is the national service organization for more than 900 not-for-profit rural electric cooperatives and public power districts providing retail electric service to more than 42 million customers in 47 states. NRECA's members include consumer-owned local distribution systems and 65 generation and transmission cooperatives that supply wholesale power to their distribution cooperative owner-members.

TAPS is an association of transmission-dependent utilities in more than 35 states, promoting open and non-discriminatory transmission access.[2] As TDUs, TAPS members are dependent in whole or part on transmission and ancillary services provided by public utility transmission providers under open access transmission tariffs.

APPA, NRECA, and TAPS members have a vital interest in the availability of transmission and ancillary services at just and reasonable rates, and the competitive functioning of wholesale power markets, including the prevention of the exercise of market power in wholesale ancillary service markets.

---

[2] Duncan Kincheloe, Missouri Joint Municipal Electric Utility Commission, chairs the TAPS Board. Jane Cirrincione, Northern California Power Agency, is TAPS' Vice Chair. John Twitty is TAPS' Executive Director.

Communications regarding these proceedings should be directed to:

Allen Mosher
Delia D. Patterson
AMERICAN PUBLIC POWER ASSOCIATION
2451 Crystal Drive, Suite 1000
Arlington, VA 22202
Tel.: (202) 467-2900
Fax: (202) 467-2918
E-mail: amosher@publicpower.org
dpatterson@publicpower.org

Cynthia S. Bogorad
Latif M. Nurani
SPIEGEL & MCDIARMID LLP
1875 Eye Street, NW
Suite 700
Washington, DC 20006
Tel.: (202) 879-4000
Fax: (202) 393-2866
E-mail: cynthia.bogorad@spiegelmcd.com
latif.nurani@spiegelmcd.com

Paul M. Breakman, Associate Director – Regulatory Counsel
Barry Lawson, Associate Director – Power Delivery & Reliability
NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
4301 Wilson Boulevard
Arlington, VA 22203
Tel.: (703) 907-5844
E-mail: paul.breakman@nreca.coop
barry.lawson@nreca.coop

John Twitty, Executive Director
TRANSMISSION ACCESS POLICY STUDY GROUP
4203 E. Woodland St.
Springfield, MO 65809
Tel.: (417) 838-8576
E-mail: 835consulting@gmail.com

COMMENTS

I. THE NOPR'S FINDING THAT FREQUENCY RESPONSE CAN BE EFFECTIVELY PROVIDED BY ANY RESOURCE IN THE INTERCONNECTION REQUIRES CLOSER EXAMINATION

The NOPR proposes to rely on the MBR screens used for energy and capacity sales to ensure that sellers of primary frequency response service lack market power when making sales to public utility transmission providers. It does so based on its conclusion that "the geographic market for a primary frequency response product could be the entire interconnection within which the buyer resides, and in any event would be

no smaller than the geographic market represented in the existing market power screens." NOPR P 23. This central conclusion rests on the following finding:

> [P]rimary frequency response service can be effectively supplied by any resource throughout an interconnection and have the same ability to dampen harmful changes in interconnection-wide frequency.

Id. (footnote omitted).

The NOPR supports this conclusion by citing comments filed by Edison Electric Institute,[3] but does not seriously examine the question of whether generators throughout the interconnection do in fact have the "same ability to dampen harmful changes in interconnection-wide frequency." *Id.* While remote generators may be capable of responding, there is reason to be concerned that frequency response from a distant generator is less effective than frequency response from a nearby generator.

Generators providing primary frequency response service automatically respond to changes in frequency, including those frequency changes caused by a major event such as an outage. But there is a time delay from when an event occurs to when the generator responds and when that response can begin stabilizing frequency at the source of the event.[4] That time delay is greater when there is a large physical distance between the source of the event and the location of the generator providing frequency response. So in large interconnections—like the Eastern and Western Interconnections—relying on a

---

[3] NOPR P 23 n. 36, citing Edison Electric Institute Post-Workshop Comments, Docket No. AD14-7-000, at 8 (filed June 3, 2014).

[4] FNET, a research project operated by the Power Information Technology Laboratory at the University of Tennessee in partnership with Oak Ridge National Laboratory, provides a visual representation of the time it takes for frequency waves to propagate through an interconnection in response to an event. http://fnetpublic.utk.edu/sample_events.html. For example, see FNET's visualization of the frequency on the Eastern Interconnection following a large generator trip caused by the 2011 East Coast Earthquake. http://www.youtube.com/watch?v=XUN_h-k8kBg.

distant generator to provide frequency response could create difficulties for maintaining system stability. In contrast, a generator that is closer to the source of an event could respond more quickly and effectively.[5]

We recognize that interconnection-wide scope is not required to support the proposed application to frequency response of the existing MBR screens for energy and capacity, which look to the seller's balancing authority ("BA") and directly interconnected BAs. *See* NOPR P 20. However, before assuming the geographic market for frequency response extends to all directly interconnected BAs, more must be done to better identify the practical distances within which available generators can supply effective frequency response to BAs. If a remote generator is not equally effective to locally supplied frequency response in terms of enabling a BA to maintain reliability and meet NERC requirements, the remote generator will not be effectively competing in the market, leaving within-BA resources with greater capability to exercise market power than is assumed in the MBR screens used for energy sales.

II. THE NOPR'S FINDING THAT TELEMETRY SHARING SHOULD NOT POSE ANY SIGNIFICANT BARRIER REQUIRES FURTHER EVALUATION

The NOPR recognizes that to provide primary frequency response, remote resources within an interconnection will have to make communication arrangements for sharing telemetry data to distant balancing authorities, but states in a footnote without any

---

[5] NERC's Essential Reliability Services Task Force ("ERSTF") is engaged in a multi-faceted effort to develop a framework for assessing essential reliability services, which include primary frequency response. The ERSTF has implicitly recognized that not all resources perform equally in providing primary frequency response, and NERC is developing guidelines to identify the characteristics of frequency response performance. NERC, *ERSTF Measures Framework Report* at 4 (Jan. 2015), http://www.nerc.com/comm/Other/essntlrlbltysrvcstskfrcDL/ERSTF%20-%20Framework%20for%20Measures%20Report%20January%202015%20-%20Final.pdf.

explanation that "such telemetry sharing should not pose any significant barrier to the use of remote resources for the purposes of market-based rates here."[6] APPA, NRECA, and TAPS are concerned that the NOPR's finding does not fully analyze and take into account the implications of sharing telemetry data across balancing authorities, particularly with respect to the cybersecurity issues that such data sharing could create. The resulting barriers to use of a remote frequency response raise serious questions as to whether the geographic market for sales of frequency response will in fact always extend beyond the seller's BA to include all directly interconnected BA areas (or the RTO market), as is used in the MBR screens for sales of energy and capacity. *See* NOPR P 20.

While the NOPR does not make clear precisely what it expects will need to be metered,[7] it seems very likely that communication of telemetry data for frequency response service will be more complex than the communications required for sales of energy and capacity, and even some other ancillary services. The telemetry data required for frequency response service is much more voluminous (owing to its higher frequency—hundreds of samples per second) and time critical. By comparison, the more normal types of data for energy sales are much less in volume and frequency, relating as they do to time intervals of several minutes up to an hour. Telemetry protocols for frequency response are quite specialized, as well as hardened for extra security and reliability, and the communications channels are relatively expensive. Also, transmitting the telemetry data from one BA to just one other BA effectively doubles (or more) the points at which the data can be intercepted or even attacked. When such data is

---

[6] NOPR P 25 n.39.

[7] A number of possibilities might be intended and have different implications for what would need to be communicated and how.

communicated to other BAs, there will no longer be a single entity (the originating BA) that is responsible for the security and reliability of the data.

For example, a generator in one reliability coordinator area could sell frequency response service to BAs in other reliability coordinator areas, and could simultaneously sell energy, capacity, and even other ancillary services to a BA in that generator's own reliability coordinator area. There are complex technical issues related to encryption and security that arise from the possibility of a single generator selling services at market-based rates (and thus communicating telemetry data) to multiple BAs in different reliability coordinator areas at the same time.

Data exchanged among balancing authorities and reliability coordinators is sent using secure (i.e., encrypted) Inter-Control Center Communication Protocols ("ICCP"), and entities within each reliability coordinator area typically use a common ICCP network. Reliability coordinators use a separate ICCP network to communicate among themselves, to which BAs and generator operators do not have access. It is unclear how a generator in one reliability coordinator area would provide telemetry data to BAs in different reliability coordinator areas, and whether such communication would occur over secure connections. If a generator were to communicate telemetry data to multiple BAs on different ICCP networks, there would be significant technical complexity involved in managing that communication because different ICCPs use different encryption keys. Alternatively, if a generator were to rely on its reliability coordinator to communicate telemetry data to BAs in other reliability coordinator areas, it would require a significant amount of planning and cooperation to implement such a system, with the added security risk of having a single data repository responsible for exchanging massive amounts of

generator data between BAs. Under any of these circumstances, the inter-balancing authority communications contemplated by the NOPR would add complexity and cost to securing this voluminous and time critical telemetry data.

Given the highly technical nature of this issue, and the potential cost of implementing solutions for generators to securely communicate data to multiple BAs, while maintaining compliance with NERC CIP Standards, communication of telemetry data may provide a much bigger obstacle to providing remote frequency response service than the NOPR contemplates. The Commission should provide additional analysis to evaluate whether these potential technical barriers will impede the ability of remote generators to compete to make MBR sales of frequency response across balancing authorities and to multiple balancing authorities, and how such barriers might impact the ability to rely on the MBR screens for energy and capacity sales to protect against the exercise of market-power in sales of frequency response to public utility transmission providers.

III. THE NOPR DOES NOT EXAMINE THE IMPLICATIONS OF REMOTE PROVISION OF MBR FREQUENCY RESPONSE ON TRANSMISSION AVAILABILITY AND COOPTIMIZATION OF ENERGY AND ANCILLARY SERVICES

The NOPR (at P 24) states that provision of frequency response service will not require the reservation or scheduling transmission service, but does not consider the impact of transmission providers setting aside transmission capacity to facilitate sales of frequency response from distant generators.[8] As a result, the NOPR could result in

[8] The NOPR notes in footnote 37 that transmission capacity will "be set aside for extended periods" even though "actual autonomous responses would be of very short duration" but does not provide any analysis of the implications of this fact. Note, however, that where there is insufficient spinning reserve to address a contingency, the duration may extend until quick start operating reserves are on line.

unintended consequences that adversely affect the availability and cost of transmission service, and the efficiency of RTO markets.

APPA, NRECA, and TAPS do not quarrel with the NOPR's conclusion that the procurement of frequency response from a remote BA is of too short a duration to require transmission reservations or scheduling. However, that should be the beginning, not the end, of the Commission's analysis of its impact on transmission of the remote supply of frequency response at MBR rates.

When a transmission provider purchases primary frequency response service from a distant generator, that transmission provider and its neighboring transmission providers will have to accommodate the responsive change in the remote generator's output, albeit for a short time, through transmission reserve margins. Depending on the amount of remote frequency response relied upon, the amount of TRM may need to be increased above current levels.[9] Increasing TRM will leave less available transfer capability for other advantageous uses of the grid for reliability and economic transactions. In addition, because no transmission reservation is required, the cost of this potentially increased TRM set aside will be borne by neither the supplier nor necessarily the buyer of

---

[9] A simplified example illustrates this issue. Consider two balancing authorities, BA X and BA Y, that each have sufficient primary frequency response to recover from an event on their systems. If BA Y experiences the loss of a 1000 MW generator, all remaining generators in both balancing authorities will immediately respond until the system reaches steady state again, with generation in each balancing authority increasing by roughly 500 MW. (Distance matters, so generators in BA Y will likely respond a little bit more than generators in BA X.) As a result, the outage would increase the transfer from BA X to BA Y by about 500 MW.

If, upon implementation of market-based rates for primary frequency response, BA Y were to purchase all of its primary frequency response from generators located in BA X, the outage event described above would have a different outcome. Immediately following the generator loss in BA Y, generators in BA X would increase by about 1000 MW (there would be some intertie response from generators in BA Y), resulting in an increase of transfer from BA X to BA Y by about 1000 MW (compared to a transfer of only 500 MW in the first scenario). To plan for such an event, the balancing authorities may have to increase their TRM to accommodate for the larger potential transfer.

frequency response, but by captive customers on the transmission systems that must pay (through their transmission rates) for transmission capacity withheld as TRM and which therefore cannot be used as ATC.

In addition, increasing TRM (and reducing ATC) to accommodate remote sales of frequency response at MBR rates would effectively allow frequency response service to trump other, potentially more valuable, uses of the transmission system. This is especially problematic in organized markets where RTOs design their energy and ancillary services markets to cooptimize these services to make maximum use of the transmission system and deliver required services at lowest cost to consumers. RTOs account for transmission constraints in their dispatch when determining the optimal amount of energy and each ancillary service to purchase from various resources. Setting aside additional TRM to accommodate remote MBR sales of frequency response would give these sales a priority without regard to their value, distorting an RTO's dispatch and undermining its efforts to use its transmission system in the manner that best cooptimizes the provision of energy and ancillary services. The interaction between the use of TRM, without transmission reservations, assumed in the proposed rule on the operations of RTO markets needs further examination to avoid undermining the efficiency of those markets.

Before proceeding to issue a final rule, the Commission should provide additional analysis of how remote supply of frequency response service at MBR will affect TRM and ATC, how the associated costs are borne, and whether this will have adverse consequences for market efficiency, particularly in RTOs.

CONCLUSION

APPA, NRECA, and TAPS share the Commission's goal of fostering the provision of needed frequency response, but urge caution in this highly complex and technical domain. Because the NOPR does not include adequate analysis of some of the more technical aspects of its proposal, and the market impacts of those issues, the Commission should provide additional analysis on the technical issues identified above, and a further opportunity for public comment.

Respectfully submitted,

/s/ Cynthia S. Bogorad

Cynthia S. Bogorad
Latif M. Nurani

Attorneys for
American Public Power Association,
National Rural Electric Cooperative
Association, and Transmission
Access Policy Study Group

Law Offices of:
SPIEGEL & MCDIARMID LLP
1875 Eye Street, NW
Suite 700
Washington, DC 20006
(202) 879-4000

April 27, 2015