

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

**Essential Reliability Services and the)
Evolving Bulk-Power System -- Primary)
Frequency Response)**

Docket No. RM16-6-000

**SUPPLEMENTAL COMMENTS OF THE NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION IN RESPONSE TO
NOTICE OF REQUEST FOR SUPPLEMENTAL COMMENTS**

The North American Electric Reliability Corporation (“NERC”) hereby submits supplemental comments in response to the Notice of Request for Supplemental Comments (“Supplemental NOPR”)¹ on the Notice of Proposed Rulemaking (“NOPR”) issued by the Federal Energy Regulatory Commission (“Commission”), regarding proposed revisions to the Commission’s rules and regulations on primary frequency response.² The NOPR proposes to impose primary frequency response requirements on newly interconnecting generation through revisions to the *pro forma* Large Generator Interconnection Agreement (“LGIA”) and the *pro forma* Small Generator Interconnection Agreement (“SGIA”) (together, the “Interconnection Agreements”). Based on initial comments regarding the NOPR, the Supplemental NOPR “[s]eeks supplemental comments related to whether and when electric storage resources should be required to provide primary frequency response, and the costs associated with primary frequency response capabilities for small generating facilities.”³

¹ *Notice of Request for Supplemental Comments re Essential Reliability Services and the Evolving Bulk-Power System—Primary Frequency Response*, 160 FERC ¶ 61,011 (2017) (“Supplemental NOPR”).

² *Essential Reliability Services and the Evolving Bulk-Power System—Primary Frequency Response*, 157 FERC ¶ 61,122 (2016) (“NOPR”).

³ Supplemental NOPR, at P 2.

As discussed in NERC’s NOPR Comments, the Commission’s proposed revisions to the *pro forma* Interconnection Agreements would be consistent with NERC reliability assessments regarding potential impacts of the changing resource mix on essential reliability services, such as primary frequency response.⁴ NERC files these supplemental comments⁵ to clarify that the Commission’s proposed enhancements to Interconnection Agreements should apply to electric storage facilities interconnected to the Bulk Power System (“BPS”) (“storage”). All newly interconnecting resources should fall within the scope of the Commission’s proposed primary frequency response requirements – including storage.

⁴ *Comments of the North American Electric Reliability Corporation in Response to Notice of Proposed Rulemaking*, Docket No. RM16-6-000 (filed Jan. 24, 2017) (“NOPR Comments”). *See also, Comments of North American Electric Reliability Corporation*, Docket No. RM16-6-000 (filed Apr. 25, 2016) (“NOI Comments”) (providing consistent comments); NERC’s Essential Reliability Services Task Force Measures Framework Report (“Framework Report”) and Abstract Document (“Abstract”) (issued December 17, 2015), NERC’s State of Reliability Report for 2015, the NERC Operating Committee’s *Reliability Guideline: Primary Frequency Control* (issued December 15, 2015), the NERC State of Reliability 2015 Report (“2015 SOR”), NERC’s 2015 Long-Term Reliability Assessment, and NERC’s 2016 Long-Term Reliability Assessment.

⁵ In 2018, NERC will also submit an informational filing addressing the adequacy of primary frequency response resources and potential enhancements to Reliability Standards, including Reliability Standard BAL-003-1.1. Reliability Standard BAL-003-1.1 currently requires Balancing Authorities (“BAs”) and Frequency Response Sharing Groups (“FRSGs”) to take action to ensure sufficient frequency response. The informational filing is due no later than July 1, 2018. In Order No. 794, the Commission directed NERC to submit reports within three months after two years of operating experience once BAL-003-1 R1 becomes effective. *Frequency Response and Frequency Bias Setting Reliability Standard*, Order No. 794, 146 FERC ¶ 61,024 (2014). The reports must address: (1) an evaluation of the use of the linear regression methodology to calculate frequency response; and (2) the availability of resources for applicable entities to meet the Frequency Response Obligation. The reports will also include any recommended revisions to Reliability Standards (such as changes to impose frequency response obligations on generation).

I. COMMUNICATIONS

Notices and communications with respect to these comments may be addressed to the following:⁶

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II. COMMENTS

Without specifically addressing storage, the Commission's proposed revisions to the *pro forma* Interconnection Agreements would require that all new generation facilities install, maintain, and operate equipment capable of providing primary frequency response as a condition of interconnection.⁷ Based on NOPR comments by the Energy Storage Association and AES Companies, the Supplemental NOPR:

[S]eeks additional information to better understand the performance characteristics and limitations of electric storage resources, possible ramifications of the proposed primary frequency response requirements on electric storage resources, and what changes, if any, are needed to address the issues raised by ESA and others.⁸

As detailed in NERC's NOPR Comments, the Commission's proposed revisions would help ensure sufficient primary frequency response as the changing resource mix increasingly

⁶ Persons to be included on the Commission's service list are identified by an asterisk. NERC respectfully requests a waiver of Rule 203 of the Commission's regulations, 18 C.F.R. § 385.203 (2017), to allow the inclusion of more than two persons on the service list in this proceeding.

⁷ Supplemental NOPR, at P 4.

⁸ *Id.*, at P 6. *See also, id.*, at PP 4-6 (describing comments and Commission questions).

integrates diverse resources.⁹ To accomplish this mission, the Commission’s proposed primary frequency response requirements should apply to storage interconnecting with the BPS.

A. The Commission’s proposed revisions to the Interconnection Agreements should apply to storage interconnecting with the BPS.

Consistent with NERC’s prior recommendations, all resources interconnecting with the BPS, including storage, should be capable of providing primary frequency response. As discussed in NERC’s NOPR Comments and NOI Comments, NERC’s assessments have demonstrated that increasing levels of inverter-coupled resources along with the retirement of conventional synchronous resources, may affect the levels of primary frequency response available. The changing resource mix may decrease primary frequency response unless a sufficient level of frequency response capability is available for the dispatch, regardless of the type of resource. Requiring that storage be capable of providing primary frequency response will contribute to reliability of the BPS.¹⁰

The most reliable form of frequency control ensures that (i) all resources are capable of providing primary frequency response, and (ii) resources be dispatched with sufficient frequency response characteristics and available energy to provide that response when necessary. Storage primary frequency response capability would support Balancing Authority efforts to ensure the existence of sufficient frequency responsive reserves to arrest and stabilize frequency during

⁹ See, NERC’s NOPR Comments (explaining, increasing levels of non-synchronous resources installed without controls that enable frequency response capability, coupled with retirement of conventional resources that have traditionally provided primary frequency response, has contributed to the decline in primary frequency response. NERC’s NOPR Comments also add that a changing resource mix will further alter the dispatch of resources and combinations of resources across the daily and seasonal demand spectrum, potentially resulting in systems operating states where frequency response capability could be diminished unless a sufficient amount of frequency responsive capacity is included in the dispatch. Per NERC’s NOPR Comments, the Commission’s proposed revisions to Interconnection Agreements, should promote reliability and help avoid a scenario where the transforming resource mix reduces frequency response capability. NERC also suggested certain refinements to communications from Interconnection Customers to Balancing Authorities (“BAs”) regarding governor/plant control characteristics.).

¹⁰ See, NOPR Comments, at pp. 5-7; and NOI Comments, at pp. 7-10.

large grid disturbances. The Commission's proposed revisions would ensure that all resources, including storage, share responsibility for arresting and recovering frequency.

NERC recognizes that several types of resources have technical limitations that may inhibit their ability to provide primary frequency response under certain circumstances. Balancing Authorities must recognize each resource's unique operating characteristics when planning unit commitment and resource dispatch to ensure that sufficient amounts of frequency response are available. For example, NOPR comments in the docket highlighted that storage facilities must protect against inadequate charge and could therefore face limited discharge capabilities.¹¹ Similarly, run-of-river hydro units may have insufficient river flow, thermal units may have discharge temperature limitations on cooling water, gas turbines may need to be derated during the summer, pumped storage may not have yet refilled storage reservoirs, units may be in the middle of coming on or going off-line, etc. Those operating constraints, however, should not preclude any resource from maintaining primary frequency response capability. Interconnecting customers entering an Interconnection Agreement should evaluate these technical limitations on a unit-by-unit basis and coordinate with their NERC Balancing Authority and Interconnection Agreement Transmission Provider/Transmission Owner, as appropriate.

¹¹ Supplemental NOPR, at P 4.

III. CONCLUSION

Wherefore, for the reasons stated above and detailed in NERC's NOPR Comments and NOI Comments, NERC supports the NOPR and clarifies that the Commission's proposed revisions to the *pro forma* Interconnection Agreements should apply to storage.

Respectfully submitted,

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Date: October 10, 2017

CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service lists compiled by the Secretary in Docket No. RM16-6-000.

Dated at Washington, DC this 10th day of October, 2017.

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