UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

INTEGRATION OF VARIABLE ENERGY RESOURCES	**)** **)**	**Docket No. RM10-11-000**

COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION IN RESPONSE TO THE FEDERAL ENERGY REGULATORY COMMISSION'S NOVEMBER 18, 2010 NOTICE OF PROPOSED RULEMAKING ON THE INTEGRATION OF VARIABLE ENERGY RESOURCES

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I. INTRODUCTION

The North American Electric Reliability Corporation ("NERC") is pleased to provide these comments in response to the Federal Energy Regulatory Commission's ("FERC" or the "Commission") November 18, 2010 Notice of Proposed Rulemaking ("NOPR") on the Integration of Variable Energy Resources ("VERs").[1] In the NOPR, FERC proposes to "reform the *pro forma* Open Access Transmission Tariff to remove unduly discriminatory practices and to ensure just and reasonable rates for Commission-jurisdictional services."[2]

NERC's mission, as the FERC-designated Electric Reliability Organization ("ERO"),[3] is to ensure the reliability of the bulk power system in North America by, in part, developing and enforcing mandatory Reliability Standards. NERC's reliability mandate under section 215 of the Federal Power Act does not include authority to monitor and enforce market-based issues.[4] Accordingly, NERC's comments herein focus on three separate areas related to the impact of the Integration of VERs on Reliability.

[1] *Integration of Variable Energy Resources*, 133 FERC ¶61,149 (November 18, 2010) ("NOPR").
[2] NOPR at p. 1.
[3] *See North American Electric Reliability Corporation*, "Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing," 116 FERC ¶ 61,062 (July 20, 2006).
[4] *See Mandatory Reliability Standards for the Calculation of Available Transfer Capability, Capacity Benefit Margins, Transmission Reliability Margins, Total Transfer Capability, and Existing Transmission Commitments and Mandatory Reliability Standards for the Bulk-Power System*, Order No. 729, 129 FERC ¶ 61,155 at P 109 (2009).

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to the following:

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III. BACKGROUND

On January 21, 2010, FERC issued a Notice of Inquiry ("NOI") on the Integration of Variable Energy Resources.[5] In the NOI, FERC sought comment on the extent to which barriers may exist that impede the reliable and efficient integration of VERs into the electric grid, and whether reforms are needed to eliminate those barriers. A 60-day comment period was set for interested parties to provide input. NERC submitted comments in response to the NOI on April

[5] *Integration of Variable Energy Resources*, 130 FERC ¶ 61,053 (January 21, 2010) ("NOI").

12, 2010.[6] NERC's comments provided responses that focused on the reliability impacts of integrating VERs into the grid, and NERC's ongoing efforts to address reliability considerations. On November 18, 2010, FERC issued its NOPR regarding the Integration of VERs in which it proposed to reform the *pro forma* Open Access Transmission Tariff to remove unduly discriminatory practices and to ensure just and reasonable rates for Commission-jurisdictional services. By this filing, NERC provides comments in response to the NOPR.

IV. DISCUSSION

In formulating its response to the NOPR, NERC sought input from industry stakeholders, the NERC Operating Committee, NERC Planning Committee, and the Integration of Variable Resources Task Force ("IVGTF"). To this end, NERC posted to its website a letter addressed to its Planning and Operating Committees titled *NERC's Directional Topics Addressing NERC's Response to FERC's Notice of Proposed Rulemaking on Integration of Variable Energy Resources.*[7] In this posting, NERC provided reliability considerations and sought input from the committee members on the three separate areas relating to the integration of VERs discussed below.

a. Inconsistency with NERC Reliability Standards

In the NOPR, the Commission proposed "to amend sections 13.8 and 14.6 of the *pro forma* OATT to provide transmission customers the option to schedule transmission service on an intra-hour basis, at intervals of 15 minutes."[8] Noting that the proposed 15-minute interval

[6] *See Comments of the North American Electric Reliability Corporation in Response to the Federal Energy Regulatory Commission's January 21, 2010 Notice of Inquiry on the Integration of Variable Energy Resources.* Docket No. RM10-11-000 (April 12, 2010).
[7] *See* NERC Planning Committee, available at http://www.nerc.com/filez/pc.html (December 6, 2010).
[8] NOPR at P 37.

was "consistent with the ideal time increments (*i.e.*, 5 to 15 minutes) recommended by NERC,"[9] the Commission requested comment on whether there was any inconsistency among relevant NERC Reliability Standards and the proposed intra-hour scheduling tariff reform.

In response to the Commission's request for comment, NERC worked with industry stakeholders to perform a preliminary review of its Reliability Standards. NERC has not identified any insurmountable hurdles that would prevent the industry from providing intra-hour scheduling flexibility. NERC notes that certain entities currently offer various forms of scheduling on a 15-minutes basis, and, to date, NERC is not aware of this causing any conflicts with NERC's Reliability Standards.

Yet, NERC acknowledges that making a 15-minute scheduling interval more routine, including (critically) for inter-Balancing Area (BA) transactions, would likely require review and refinements to several existing Reliability Standards.[10] In particular, there would likely be a need for changes to NERC's Interchange Scheduling and Maintenance Coordination (INT) Reliability Standards, which were largely written based on the assumption that many schedules will be on an hourly basis. To the extent that this assumption has resulted in wording that is consistent with an hourly regime, interpretations or modifications to the INT Reliability Standards would likely be required. While it is expected that only minor wording changes to affected standards may be necessary, adopting interconnection-wide intra-hour scheduling could have a substantial impact on practices and tools used by transmission operators to maintain reliable operations. Time and attention to the details (regarding impacts and changes to

[9] NOPR at P 37.

[10] *See e.g.*, NERC Reliability Standards BAL-005, R12.1 (Automatic Generation Control), BAL-006, R1 (Inadvertent Interchange), EOP-008 (Plans for Loss of Control Center Functionality), INT-001, R1.1 (Interchange Information), INT-004-2 (Dynamic Interchange Transaction Modifications), INT-005-003 (Interchange Authority Distributes Arranged Interchange), INT-006-3 (Response to Interchange Authority), INT-008, R1 (Interchange Authority Distributes Status).

Reliability Standards, practices and tools) would be required, but a transition to more widespread use of intra-hour scheduling flexibility is achievable in a reasonable time frame.

However, NERC notes that all creation and modification of Reliability Standards must be considered as part of the NERC Reliability Standards Committee prioritization process. This prioritization process considers the regulatory, reliability, and logistical issues associated with projects to create or modify NERC standards, and helps determine the manner in which industry resources and NERC staff are deployed to create or modify Reliability Standards. Additionally, such changes must be developed in accordance with the steps outlined in the NERC Standard Processes Manual,[11] which ensures an open and inclusive process through adherence to the standards development principles of the American National Standards Institute.

In the NOPR, the Commission proposed to "allow all transmission customers the option of submitting intra-hour schedules up to 15 minutes before the scheduling interval."[12] NERC notes that the INT Reliability Standards have been written so that nearly all schedules are received at least 20 minutes ahead of the block-schedule start. This 20-minute period was set to provide the operator sufficient time to evaluate, approve, and implement the schedule request. For example, if an Eastern Interconnection schedule request is submitted at 00:40 for a schedule that starts at 01:00, then industry actions may include:

- communication time required as the request is transmitted, received, and processed;
- sufficient time for the entities reviewing the request to evaluate the request;
- communication time required to verify that all entities have agreed to implement the requested schedule and coordinate that agreement between all entities; and

[11] The NERC Standard Processes Manual is Appendix 3A to the NERC Rules of Procedure.
[12] NOPR at P 41.

- time entities will need to input the request into their scheduling systems.

When combined, the required time is currently 15 minutes (00:55) to perform these tasks with the remaining time allowing for the initiation of the ramp, which in the Eastern Interconnection is based on the standard ramp of 10 minutes that straddles across the block-schedule start (*e.g.*, begin ramping at 00:55 and complete ramping at 01:05). Changes that impact this timing will need to be accounted for in modifications to the associated INT Reliability Standards (*i.e.*, INT-005 and INT-008), and will result in significant changes in the way in which operators currently process such requests. As a result of this fairly tight advance notice time frame for processing schedule changes, any change to the existing 20-minute prior notice evaluation period for schedules should be undertaken with caution.

The Commission also requested comments regarding any changes that might be necessary in hardware, software, or personnel. As indicated above, transmission providers offering and executing on 15 minute scheduling would require changes (some substantial) to existing tools and processes used to perform scheduling and curtailment activities. For example, the Interchange Distribution Calculator, a tool which is used in the Eastern Interconnection to manage congestion, generally operates on an hourly basis, as does the Western Interconnections WebSAS tool. In addition, wide-spread intra-hour scheduling may require system operators to adopt increasingly automated processes, as significant aspects of existing processes (*i.e.*, check out) are often performed manually. The need to account for shorter-term schedules, combined with the potential increase in volume of transactions processed, would in some instances require changes to both hardware and software. NERC believes such analysis would need to be performed before the issuance of a Final Rule so that the requirements are known and therefore compliance is feasible.

While NERC does not have personnel that would be directly impacted by the proposed change, NERC believes that entities that review and implement schedule requests would likely see their personnel needs increase. Such entities would also likely see increased demands on their software and hardware associated with processing schedule requests.

b. NERC Definition of Variable Energy Resource

In the NOPR, FERC proposed to define a VER as "energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility owner or operator."[13] Noting that this definition is consistent with NERC's characterization of variable generation, the Commission sought comment on the proposed VER definition. NERC supports the VER definition proposed by the Commission and believes it is sufficient.

c. Reliability Impacts from Use of Existing or New Ancillary Services to Address Extreme Ramp Events

In the NOPR, the Commission requested comments "on the extent to which some additional type of contingency reserve service (beyond the services provided under Schedule 5 and 6 of the pro forma OATT) would ensure that VERs are integrated into the interstate transmission system in a non-discriminatory manner, while remaining consistent with NERC Reliability Standards."[14]

Large wind ramping events have characteristics that are both similar to and different than conventional generator contingency events. They are similar in that the large events are large and relatively infrequent. They differ in that wind ramps are much slower than instantaneous contingency events and the extreme wind ramps may be possible to forecast. Figure 1 below

[13] NOPR at P 64 (citing NERC, *Accommodating High Levels of Variable Generation* at 13-14 (2009), available at http://www.nerc.com/files/IVGTF_Report_041609.pdf).
[14] NOPR at P 100.

shows a large (1500 MW) wind ramp event that occurred in February 2007, in the Electric Reliability Council of Texas ("ERCOT") region. While this event is large and can present a serious operational challenge, it does not occur every day, it emerges slowly compared with a conventional generation contingency, which happens essentially instantaneously. Generally, there is a range of such ramp requirements, with the largest being relatively infrequent.

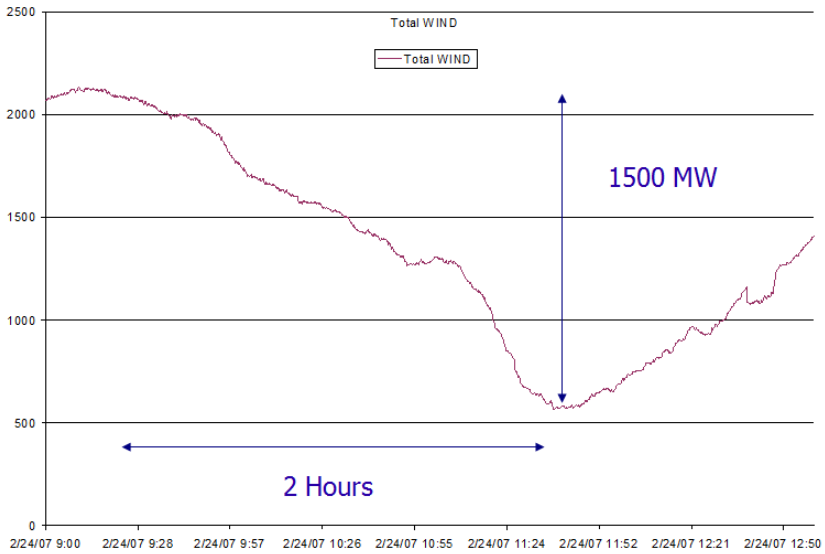

Figure 1 ERCOT 2/24/2007 wind event.

The use of contingency reserves is similar to what is used to address large, relatively infrequent wind ramps because contingency reserves are seldom deployed. Typically, contingency reserves are split between spinning and non-spinning. For large ramps lasting several hours, the ramp duration makes it difficult to include wind ramps as actual contingencies. Resource and Demand Balancing (BAL) Reliability Standard BAL-002 (Disturbance Control Performance) requires ACE to be restored 15 minutes following the disturbance (R4) and the contingency reserves to be restored within 105 minutes (90 minutes after the 15 minute disturbance recovery period – R6). Both of these requirements can be problematic for wind ramps since they can be longer than the disturbance recovery period as well as the reserve restoration period. System operators typically restore reserves much faster (within approximately ten minutes following the disturbance

recovery period). Therefore, including two hour wind ramps as contingencies would also be problematic.

A further issue with a large, long ramp is the point at which the event can be identified. For example, during the ERCOT event identified in the Figure 1 above, a full 20 minutes into the event it may not have been clear to the operator whether the wind power will continue declining or whether the ramp is (nearly) over, unless the ramp forecasts are accurate. This highlights the importance of an accurate wind forecast so that wind generators can schedule a reasonable forecast of their expected output.

Still, it may be appropriate to use contingency reserves in response to a portion of a wind ramp. Shared contingency reserves could be used to initiate the response, allowing time for alternate supply (or load reduction) to be implemented. The frequency of ramp events would need to be studied to determine which ramps are compatible with contingency reserve use. The industry should consider developing rules governing reserve deployment and restoration, similar to those that currently address conventional contingencies.

Some entities are considering rules that will allow contingency reserves to be deployed to help manage large, infrequent wind ramping events. NERC believes that the industry should consider how best to deal with this incremental risk. Specifically, NERC believes that further analysis of how wind ramps can be recovered using contingency reserves should be undertaken as well as consideration of how wind generation can minimize the impacts of wind ramps through improved forecasting and market tools, products, and requirements. The predictability, duration, magnitude, and ramp rate of an event are all important factors that are used in determining how reserves for these events should be held.

If Balancing Authorities can predict an occurring event, and to some degree know the duration, magnitude, and ramp rate of a future event, they can use that information to ensure that

the correct reserve is ready to be deployed. This type of analysis could potentially be done with historic data that demonstrates the characteristics of the wind regime of the particular balancing area (as shown in the Figure 1).

With improved forecasting systems, real-time forecast information should also be used to assist in determining what reserve requirements to hold for such events.

V. CONCLUSION

NERC is pleased to provide these comments in response to the Commission's NOPR and looks forward to working with the Commission to ensure the successful integration of VERs while maintaining the reliability of the bulk power system.

Respectfully submitted,

/s/ Willie L. Phillips

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CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C. this 2nd day of March, 2011.

/s/ Willie L. Phillips
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