

MEMORANDUM

TO: Nebraska Power Review Board
Tim Texel, Esq.

FROM: David C. Levy
Hannes D. Zetsche

DATE: May 2, 2025

RE: Eolian's Proposed Amendments to Guidance Document No. 14

We represent Eolian Energy, a national leader in developing energy storage resources ("ESRs"). Eolian currently has multiple standalone ESRs under development in Nebraska. We write to explain Eolian's suggestions in Guidance Document No. 14.

Eolian supports defining "hybrid" ESR facilities as recommended by the North American Electric Reliability Corporation ("NERC"). NERC defines "hybrid" resources as "[a] generation resource that is comprised of multiple generation or energy storage technologies controlled as a single entity and operated as a single resource behind a single point of interconnection."¹

We recommend this exact language in the Guidance Document's Section III definition of "Hybrid." We provide comments and revisions in the attached Addendum.

Omaha Public Power District ("OPPD") has proposed revisions that generally align with NERC's hybrid definition. However, they introduce extraneous hybrid criteria around "sharing" an interconnection agreement, which is an incomplete legal concept.

Hybrid facilities share a single point of interconnection as defined by NERC. But the Southwest Power Pool permits at least three interconnection structures for hybrid facilities, not all of which require "sharing" an interconnection agreement.

Our proposed revisions correct this and streamline the Guidance Document with NERC's definition of "hybrid" resource. Please accept our revisions in the Addendum.

¹ *Reliability Guideline*, North American Electric Reliability Corporation, at p. X (Jun. 2023), *available at* https://www.nerc.com/comm/RSTC_Reliability_Guidelines/Reliability_Guideline_BEES_Hybrid_Performance_Modeling_Studies.pdf and at page eight below.

GUIDANCE DOCUMENT NO. 14*

ELECTRIC ENERGY STORAGE RESOURCES

I. Purpose

This policy establishes the Nebraska Power Review Board's (the Board) interpretation regarding the definition of electric energy storage resources (ESR), the Board's jurisdiction over such resources, and procedural issues related to the filing and consideration of applications for such resources.

II. Power Review Board Jurisdiction over Energy Storage Resources

The Board finds that ESRs fall within the agency's jurisdiction and therefore must either be approved or confirmed to be exempt prior to commencement of construction or installation. Neb. Rev. Stat. section 70-1012 states "Before any electric generation facilities or any transmission lines or related facilities carrying more than seven hundred volts are constructed or acquired by any supplier, an application, filed with the board and containing such information as the board shall prescribe, shall be approved by the board."

Although there is no definition of an ESR in Nebraska law, and there does not yet appear to be a clear industry standard regarding how to characterize such resources, there appears to be a general consensus in the electrical industry that ESRs have the ability to demonstrate characteristics of a generation asset, a transmission asset, or a combination of generation and transmission referred to as a "multi-use" asset. Regardless of whether an ESR is characterized as generation, transmission, or multi-use, the Board believes that any of those options would fall within the Board's jurisdiction under the language set out in section 70-1012.

As with all other generation assets, exemptions to the Board's jurisdiction apply for facilities that obtain federal approval and those that will not supply, produce or distribute electricity within the state for sale to third parties at wholesale or retail (often referred to as "self-generation").

* This guidance document is advisory in nature but is binding on an agency until amended by such agency. A guidance document does not include internal procedural documents that only affect the internal operations of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules and regulations made in accordance with the Administrative Procedure Act. If you believe that this guidance document imposes additional requirements or penalties on regulated parties, you may request a review of the document.

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In accordance with Neb. Rev. Stat. section 70-1012, the Board's jurisdiction applies to those transmission facilities carrying over 700 volts.

Unless an ESR is associated with another facility and subject to the provisions in section IV, or is self-generation, ESRs must follow the approval procedures set out in section V.

III. Definitions

Electric energy storage resource is a resource capable of receiving electric energy from the grid, or from a generation resource with which it is associated, and storing it for later injection of electric energy into the grid. Devices or equipment intended solely to inject or absorb reactive power, such as capacitors and synchronous condensers, and equipment the purpose of which is to provide power for an electric vehicle (i.e., electric vehicle batteries) are not electric energy storage resources for purposes of this Guidance Document.

Multi-use refers to ESRs that can be operated as either a generation asset or as a transmission asset.

Hybrid refers to facilities that have an ESR co-located at the same site as a generation resource: that is comprised of multiple generation or energy storage technologies controlled as a single entity and operated as a single resource behind a single point of interconnection.

Commented [ES1]: Use NERC definition as OPPD suggested, then hybrid criteria do not need to be repeated in IV(a) or (b).

IV. Energy Storage Resources Included as Part of Another Facility

a. Hybrid Facilities (ESR Constructed In Conjunction With A Generation Facility)

If an ESR is to be constructed or installed in conjunction with, and as part of, another generation facility, the ESR may be included as part of the application for the primary generation resource and does not require a separate application. To be considered part of another facility, ~~the ESR's primary purpose must be to store the electricity produced by the generation facility with which it is associated, the ESR must be located on the same premises or in the immediate vicinity of the generation facility with which it is associated and share a single point of interconnection, the generating facility and ESR are operated and dispatched as a single resource, the ESR and generating facility share an interconnection agreement or surplus interconnection agreement, and the ESR must be part of a hybrid facility and~~ the aggregate rated capacity of ESRs cannot exceed that of the generation facility with which it is associated. The owner of the associated generation facility must either

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be the applicant or a co-applicant for the facility. The Board anticipates this scenario will normally occur where an ESR is constructed or installed as part of an intermittent renewable generation facility, such as a wind or solar generation facility, in order to provide back-up capability to inject electricity into the grid for purposes of providing temporary dispatchability.

1. If an ESR is constructed or installed at a later time than the generation facility with which it is associated (i.e., after the commercial operation date of the generation facility), the ESR will be considered a facility improvement and does not require an application to be filed with the Board so long as the requirements set out in IV.a. above are met, including that the capacity of the ESR (or aggregate capacity of multiple ESRs) does not exceed the rated capacity of the generation facility with which the ESR is associated. The owner of the ESR must submit written notice to the Board that the ESR is being constructed or installed. The notice will inform the Board of the location, the facility with which the ESR is associated, and the capacity of both the ESR and the underlying generation facility. The notice is not required to be in any specific format. A letter or email is sufficient.
 2. It is the Board's understanding that a facility cannot inject more electricity onto the grid at any given time than is approved in its interconnection agreement. Therefore, if the owner or operator of a generation facility with which an ESR is associated enters into an interconnection agreement that increases the maximum limit of electricity the facility can inject onto the grid beyond the capacity of the primary generation facility with which the ESR is associated then, upon approval of such interconnection agreement, the ESR associated with the primary generation facility is no longer considered part of the facility and must obtain the Board's approval to continue operating. ~~If an ESR does not share an interconnection agreement or surplus interconnection agreement with the generation facility, then the ESR shall be deemed unaffiliated with the generating facility and must follow the approval procedures set out in section V.~~
- b. ESR Constructed With A Privately Developed Renewable Energy Generation Facility

If an ESR is to be installed or constructed by the owner of a Privately Developed Renewable Energy Generation Facility (PDREGF), the ESR

Commented [ES2]: Not part of the NERC definition and does not reflect SPP's historic treatment of storage interconnections.

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will be considered part of the PDREGF as long as the ESR is part of a hybrid facility is electrically connected to the PDREGF, will be on the same premises or in the immediate vicinity of the PDREGF, its and both share a single point of interconnection, the generating facility and ESR are operated and dispatched as a single resource, the ESR and generating facility share an interconnection agreement or surplus interconnection agreement, the ESR's primary purpose is to store the PDREGF's output, and the aggregate rated capacity of all ESRs associated with the PDREGF is no greater than the rated capacity of the PDREGF. The owner of the PDREGF can request that the ESR not be considered part of the PDREGF and be treated as a separate facility.

Commented [ES3]: This is covered by NERC hybrid definition above and is consistent with IV(a) language.

1. If an ESR is constructed or installed at a later time than the PDREGF with which it is associated (i.e., after the commercial operation date of the PDREGF), the owner of the ESR must submit a new PDREGF notice with the proper certifications to the Board, pursuant to Neb. Rev. Stat. section 70-1014.02. The ESR is eligible to be considered part of (i.e., an addition to), the PDREGF with which it is associated, so long as the aggregate rated capacity of ESRs associated with the PDREGF is no greater than the PDREGF. (See Neb. Rev. Stat. section 70-1001.01(10)).
 2. If the PDREGF with which the ESR is associated is decommissioned or otherwise removed from service, the exemption from the Board's approval jurisdiction under Neb. Rev. Stat. sections 70-1012 to 70-1014.01 ends and the ESR associated with the former PDREGF must file an application with the Board for authority to continue operating the ESR. An application for authority to continue operating the ESR follows the same procedure as an application for a new generation or transmission facility.
 3. An ESR constructed or installed in association with a PDREGF will only be considered a generation asset (i.e., it will not be considered a transmission asset).
- c. ESR Constructed With A PURPA Qualifying Facility

If an ESR is installed or constructed as part of a qualifying facility under the Public Utility Regulatory Policies Act of 1978 (PURPA), the ESR will be considered part of the PURPA qualifying facility as long as the Federal Energy Regulatory Commission (FERC) determines the ESR is part of the qualifying facility (whether or not a new Form 556 filing is

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required), unless the owner of the facility requests that the ESR not be considered part of the PURPA qualifying facility and be treated as a separate facility.

1. If FERC determines an ESR is not eligible to be considered part of the qualifying facility with which the ESR is associated, the Board's authority is not preempted, and the owner of the ESR must file an application with the Board for approval of the facility, unless the ESR is otherwise exempt.

d. ESR Constructed In Association With A Transmission Facility

If an ESR is constructed or installed in conjunction with, and as part of, another transmission facility, the ESR will require a separate application. Even though its intended purpose may be to provide dedicated transmission services, it also shares the ability to be operated in a method that could be characterized as a generation resource. Since the Board has initial approval authority over generation and transmission assets, and does not have continuing general authority over such assets, the Board needs to be able to analyze the resource in both capacities. If a transmission project and a closely related or dependent ESR are filed separately, the applicant can request in its application that the two projects be consolidated for purposes of review and approval. The Board may also consolidate two closely related projects sua sponte.

V. Power Review Board Approval Procedures for ESRs

- a. [Any public or private person or legal entity may apply for approval of an ESR under Neb. Rev. Stat. section 70-1012.](#) For purposes of filing an application with the Board for approval of an ESR, the person or entity wishing to construct or install the resource should use "Appendix C: Application for authority to construct or acquire an electric generation facility and/or related facilities", as set out in the Board's Rules of Practice and Procedure, Title 285, Nebraska Administrative Code, Chapter 2, page 8. Appendix C is used is for purposes of convenience, uniformity, and the type of information gathered on the form. It is not determinative regarding whether the ESR will be considered a generation or transmission asset for purposes of its approval or its operation.
- b. When completing the application, the applicant should indicate that the facility will be an ESR by removing the word "generation" in the right side of the caption heading just above "Application No. PRB-_____" and replacing it with "Energy Storage Resource". The applicant should

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also indicate the asset will be an energy storage resource in the answer on line (1)C, asking for "Type of unit or alternate types (Nuclear, conventional, hydro)".

- c. When completing the application, the applicant should indicate whether the facility's primary purpose is to function as a generation asset, a transmission asset, or a multi-use asset.

Timothy J. Texel
Executive Director and General Counsel

Approved at NPRB Board Meeting on 6/14/21
Amended at NPRB Board Meeting on 2/17/23
Amended at NPRB Board Meeting on 4/18/25

OPPD NOTES (explanatory only – not to be included in the Guidance Document):

NERC's definition of Hybrid: "a generating resource that is comprised of multiple generation or energy storage technologies controlled as a single entity and operated as a single resource behind a single point of interconnection"

FERC's definition of Integrated Hybrid Resource: "sets of resources that share a single point of interconnection, and are modeled and dispatched as a single integrated resource"

5 elements of a hybrid: 1) Consists of more than one resource which includes different types of generation, 2) includes some amount of energy storage, 3) located behind a single point of interconnection, 4) operated and coordinated to appear as a single resource to the system operator, 5) incorporates controls that coordinate the output across multiple resources to maximize the value to the system and/or plant owner.

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Each of the energy storage technologies described can provide benefits to BPS reliability and resilience. The interaction between battery energy storage devices and the electrical grid is dominated by the power electronics interface at the inverter level and plant controller level, specifically on small time scales (from microseconds to tens of seconds to minutes). The interactions that BESS and hybrid plants have with the BPS is the primary focus of this guideline, and guidance provided also covers ways that industry can model and study these resources connecting to the BPS.

Fundamentals of Hybrid Plants with BESS

Hybrid power plants are also becoming increasingly popular due to federal incentives, cost savings, flexibility, and higher energy production by sharing land, infrastructure, and maintenance services. Hybrid power plants (“hybrid resources”) are defined here as follows:

Hybrid Power Plant (Hybrid Resource): A generating resource that is comprised of multiple generation or energy storage technologies controlled as a single entity and operated as a single resource behind a single point of interconnection (POI).

There are many types of hybrid power plants that combine synchronous generation, inverter-based generation, and energy storage systems;⁹ however, the most predominant type of hybrid power plant observed in interconnection queues across North America is a combination of renewable energy (solar PV or wind) and battery energy storage technologies.¹⁰ Due to this fact, this guideline concentrates primarily on hybrid plants that combine renewable (specifically inverter-based) generation with BESS technology.

The conversion of dc to ac current occurs at the power electronics interface. However, the way this conversion occurs within a hybrid plant affects how the resource interacts with the BPS, its ability to provide ERSs, how it is modeled, and how it is studied. Hybrid plants can be classified as either of the following:

- **AC-Coupled Hybrid Plants:** An ac-coupled hybrid power plant couples each form of generation or storage at a common collection bus after it has been converted from dc to ac at each individual inverter. [Figure I.1](#) shows a simple illustration of one possible configuration of an ac-coupled hybrid power plant where a BESS is coupled with a solar PV or wind power plant on the ac side. The BESS may be charged either from the renewable generating component or from the BPS if appropriate contracts and rates are available.
- **DC-Coupled Hybrid Plants:** A dc-coupled hybrid power plant couples both sources at a dc bus tied to the grid via a dc-ac inverter. There are often dc-dc converters between the individual units and the common dc collection bus. [Figure I.2](#) shows a simple illustration of another possible configuration of a dc-coupled hybrid power plant where the energy storage component is coupled through a dc-dc converter on the dc side. The dc-ac inverter can be unidirectional where the BESS can only be charged from the renewable resource or bi-directional where the BESS can also be charged from the BPS (depending on interconnection requirements and agreements).¹¹ There are multiple possible configurations for dc-coupled facilities, particularly on the dc-side between the generating resource, the BESS, and ways they connect through the ac-dc inverter.¹²

⁹ Such as natural gas and BESS hybrid plants, combined heat and power with BESS, or multiple types of inverter-based generation technologies

¹⁰ Note that hybrid natural gas-BESS plants may be desirable in some areas where capacity shortages have been identified.

¹¹ ERCOT has drafted a concept paper specifically on dc-coupled resources, which may be a useful reference:

http://www.ercot.com/content/wcm/key_documents_lists/191191/KTC_11_DC_Coupled_2-24-20.docx.

¹² <https://www.dynapower.com/products/energy-storage-solutions/dc-coupled-utility-scale-solar-plus-storage/>