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**To:** Gerry Dunbar, Northeast Power Coordinating Council (NPCC)

**From:** The New York State Reliability Council (NYSRC)

**Subject:** Recommendations for Incorporating Provisions of IEEE-2800 *Standard for Interoperability of Inverter Based Resources (IBR)* into the Applicable NPCC Criteria.

**Date:** October 4, 2023

**Item #1.** It is noted that NPCC has limited its recommendations to the interoperability requirements of IEEE-2800 and has relied on those NPCC Full Members with local Authority Governing Interconnection Requirements (AGIR) accountability for implementing the interconnection requirements of IEEE 2800.

The NYSRC agrees in general with NPCC's conclusion - Next Steps: *"Although, the existing criteria may be adequate to allow an NPCC Full Member serving as the AGIR the latitude to include the provisions of IEEE-2800 in its specific interconnection review and model verification processes, more specific language including citations to IEEE-2800 within the Criteria should be considered since IBR technology was not widely utilized when the existing Criteria was developed."* However, the NYSRC requests that consideration also be given to the following comments:

**NYSRC Comment #1** - The scope of the interconnection requirements within NPCC's Criteria be expanded to make IEEE 2800's minimum interconnection criteria mandatory in all NPCC Areas and also, based on the imminent wide scale deployment of Inverter Based Resources (IBRs) across NPCC, that NPCC give consideration to their implementation in the short term. Adoption of IEEE 2800's minimum requirements would provide a base set of requirements for local AGIRs to which they can add more stringent and/or more specific local Area interconnection requirements based on local facts and circumstances.

**Item #2.** NPCC recommendations in the section on Directory #1-Table 1 states: *"NPCC stakeholders should consider whether the Table 1 Category I Single Event performance requirements should be expanded to include common mode failure of non-IEEE-2800 compliant IBRs. Similar consideration for the recovery from IBR losses after a first Element loss in Category II should also be reviewed."*

The NYSRC agrees with this recommendation but foresees challenges associated in the definition of common mode failures of non-IEEE 2800 compliant IBRs in NPCC local Areas including: magnitude of loss; spatial and temporal diversity of loss. While current IBR penetration in some NPCC local areas may be relatively low, common mode failures (as

documented in numerous [NERC Events Reports](#)) of non-IEEE 2800 compliant IBRs in the near future may have significant adverse impacts on NPCC system reliability. Therefore, the NYSRC recommends that consideration be given to the following comments:

**NYSRC Comment #2a** - That the NPCC survey local NPCC Areas to identify current and forecast future non-IEEE 2800 compliant IBRs and develop a basis for determining the magnitude of their potential common mode failures so that the impacts on the reliable operation of the NPCC Bulk Power System may be analyzed in advance of any actual system disturbances in any NPCC Areas.

**NYSRC Comment #2b** - That the NPCC consider means to encourage compliance with IEEE 2800 for all existing and future IBRs as a complement to NERC activities in this area. This would support local NPCC Area AGIR's activities requiring IEEE 2800 compliance for IBR interconnections.

**Item #3.** NPCC recommendations in the section on Directory #1-Table 1 continues: "*Also, in Category II, Extreme System conditions, IBR resource adequacy (loss of fuel, e.g., sun, or wind) should be added to the performance requirements list.*" It is assumed that this recommendation is to include in NPCC Directory #1, Table 1, Category II (Design Criteria) a loss of sun and/or loss of wind in high and low wind system conditions.

If so, the NYSRC supports this recommendation based upon NYSRC's statistical analysis of 21 years of hourly data on net capacity factors of offshore wind IBRs. The analysis indicated that low capacity factors are not an extreme system condition, but occur frequently, e.g., ~10 times per year with periods of 24 hours with net capacity factors equal to or less than 10%. Longer duration events occurred less frequently but one event lasted 86 hours. The system conditions can be developed through the NPCC member stakeholder process. Therefore, the NYSRC recommends that consideration be given to the following comments:

**NYSRC Comment #3a** - That NPCC should include loss of fuel, e.g., sun and/or wind due to high and/or low wind conditions, as a Design Criteria system condition in Table 1 for Category II contingencies for Transmission Planning and also statistically incorporate loss of fuel, e.g., sun or wind for Resource Adequacy Planning.

**NYSRC Comment #3b** - That the NPCC develop combinations of system conditions which stress the system with wind and/or solar generating resource lulls based upon a coincident frequency and duration hourly analysis of historical and predicted off-shore wind, terrestrial wind, solar and electric demand data across NPCC as the basis for this recommendation.

The NYSRC is developing similar criteria for application in New York Control Area and is in support of NPCC's recommendations.