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| NOGRR Number | [272](https://www.ercot.com/mktrules/issues/NOGRR272#summary) | NOGRR Title | Advanced Grid Support Requirements for Inverter-Based ESRs |

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| Date | August 6, 2025 |

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| Market Segment | Independent Generator |

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| Comments |

Plus Power appreciates the dialogue ERCOT has had with Plus Power and the Energy Storage Resource (ESR) industry on this issue. We appreciate the opportunity to present these comments on Nodal Operating Guide Revision Request (NOGRR) 272 for stakeholder consideration.

In Plus Power’s comments filed on July 8, 2025, in subsequent conversations with ERCOT Staff, and as reflected in comments filed on August 1, 2025, by Spearmint, Mortenson, and esVolta, there continue to be operational, reliability, and compliance concerns with NOGRR272 as ERCOT proposes for adoption in its August 1, 2025, comments. There continues to be a lack of clear technical performance requirements and transition time to implement as-yet-undefined performance requirements. There continues to be a lack of clear compliance metrics. Additionally, ERCOT’s proposal that the requirements of NOGRR272 will apply to portions of an ESR when there are non-in-kind replacements of equipment or modifications that add MW capacity presents a potential risk of unexpected behavior during fault responses.

In its August 1 comments, ERCOT appears to equate the interconnection of grid-forming (GFM) Inverter-Based Resources (IBRs) with the integration of synchronous generators which are GFM. While both are grid forming, it is important to recognize that the speed with which a GFM IBR can respond to grid conditions can be very different than a synchronous generator. As a result, there is a need for tuning and coordination of GFM IBRs to ensure they support reliable grid operations rather than inadvertently undermining reliability. For example, GFM IBRs that are not coordinated can actually counteract the benefits each is trying to bring to the grid:

It was shown that large inertia and droop values push parallel-connected GFMIs to oscillate against each other... Even GFMIs with identical control and network parameters can oscillate against each other.[[[1]](#footnote-1)]

An apt analogy to the integration is GFM IBR is a dance troupe:

Envision this dance floor evolving into a more complex performance with multiple lead dancers, each representing a GFM inverter. This troupe coordinates its movements and then communicates and adjusts the rhythm based on each other’s performance. Much like the synchronization between multiple GFM inverters, this ensures the dance remains fluid, even if one dancer falters. The GFM inverters adjust their power output and are able to compensate for any faltering inverter while still maintaining the grid’s voltage and frequency stability.

Choreographing for such a troupe requires expert finetuning for effective cooperation, much like the intricate configuration of multiple GFM inverters operating in tandem. Control settings must be adjusted, considering the overall system’s characteristics and requirements. It is akin to an experienced choreographer ensuring every dancer’s steps align with the troupe’s overall performance.

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Just like a well-coordinated dance troupe, this harmonious integration is necessary to unify IBRs with synchronous generators in future clean energy grids and ensure the power system dances to a seamless and reliable tune.[[[2]](#footnote-2)]

 Plus Power appreciates that one of the key objectives for adoption of NOGRR272 on an emergency basis is to maximize the number of new ESRs that interconnect with the ERCOT grid have advanced grid support capabilities. To achieve this objective, but still allow time to address the additional details that are necessary to ensure reliable operations of these capabilities, Plus Power respectfully recommends that stakeholders endorse the proposed revisions proposed by the Joint Commenters in their July 9, 2025, comments, but with an additional change to strike the last sentence of proposed paragraph (2) of Section 2.14. This approach would allow ERCOT to complete the necessary comprehensive studies and define system-wide performance requirements to deliver the grid support ERCOT seeks without exposing Texans to untested reliability risks or forcing storage owners into obligations under threat of enforcement actions. Plus Power remains ready to collaborate on to create clear, equitable, and technically justified market rules for grid forming inverters.

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| Revised Cover Page Language |

None

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| Revised Proposed Guide Language |

 **2.14 Advanced Grid Support Requirements for Inverter-Based Resources (IBRs)**

(1) An ESR shall meet the modeling requirements described in Planning Guide Section 6.2, Dynamics Model Development, to demonstrate its capability to maintain an internal voltage phasor in the sub-transient-to-transient timeframe and control the voltage phasor to maintain synchronism with the ERCOT Transmission Grid.

(2) An ESR interconnected to the ERCOT Transmission Grid pursuant to a Standard Generation Interconnection Agreement (SGIA) executed before April 1, 2026, is not required to comply with the requirements of this Section.

1. T. Thilekha, S. Filizadeh, U.D. Annakkage, C. Karawita, D. Muthumuni, Analysis of interactions among parallel grid-forming inverters, Electric Power Systems Research, Volume 223, 2023. (Available at <https://www.sciencedirect.com/science/article/abs/pii/S0378779623005412>). [↑](#footnote-ref-1)
2. Behrooz Bahrani, Mohammad Hasan Ravanji, Benjamin Kroposki, Deepak Ramasubramanian, Xavier Guillaud, Thibault Prevost, and Nicolaos-Antonio Cutululis, Grid-Forming Inverter-Based Resource Research Landscape, IEEE Power Magazine (March/April 2024) at 20 (Available at <https://ieee-pes.org/wp-content/uploads/2024/03/Open-Article-March-April-2024-Grid-Forming_Inverter-Based_Resource_Research_Landscape_Understanding_the_Key_Assets_for_Renewable-Rich_Power_Systems.pdf>). [↑](#footnote-ref-2)