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| PGRR Number | [120](https://www.ercot.com/mktrules/issues/PGRR120) | PGRR Title | SSO Risk Reduction for Generator Interconnection |
| Date Posted | June 5, 2025 |
| Action | Recommended Approval |
| Timeline | Normal |
| Proposed Effective Date | To be determined |
| Priority and Rank Assigned | To be determined |
| Planning Guide Sections Requiring Revision  | 5.2.10, Subsynchronous Oscillation (SSO) Risk Reduction (new)5.3.1, Security Screening Study |
| Related Documents Requiring Revision/Related Revision Requests | None |
| Revision Description | This Planning Guide Revision Request (PGRR) prevents generators from interconnecting to the ERCOT Transmission Grid if the generator would be radial to a series capacitor under N-1 conditions.   |
| Reason for Revision |  [Strategic Plan](https://www.ercot.com/files/docs/2023/08/25/ERCOT-Strategic-Plan-2024-2028.pdf) Objective 1 – Be an industry leader for grid reliability and resilience [Strategic Plan](https://www.ercot.com/files/docs/2023/08/25/ERCOT-Strategic-Plan-2024-2028.pdf) Objective 2 - Enhance the ERCOT region’s economic competitiveness with respect to trends in wholesale power rates and retail electricity prices to consumers [Strategic Plan](https://www.ercot.com/files/docs/2023/08/25/ERCOT-Strategic-Plan-2024-2028.pdf) Objective 3 - Advance ERCOT, Inc. as an independent leading industry expert and an employer of choice by fostering innovation, investing in our people, and emphasizing the importance of our mission General system and/or process improvement(s) Regulatory requirements ERCOT Board/PUCT Directive*(please select ONLY ONE – if more than one apply, please select the ONE that is most relevant)* |
| Justification of Reason for Revision and Market Impacts | Certain generators are susceptible to Subsynchronous Resonance (SSR) and subsynchronous ferroresonance when connected to a transmission line with a series capacitor and this poses a risk to the ERCOT System. In addition to damaging impacts to the ERCOT Transmission Grid, SSR and subsynchronous ferroresonance-related issues can cause negative impacts to Resource Entities. Addressing such issues could cause delays or disruptions at any stage of the generator interconnection timeline, including the planning stage, commissioning, or even during commercial operation.Real-Time SSR events, including several in 2023, have occurred with generators interconnected on series compensated circuits under N-1 conditions, despite SSR Mitigation being in place. Below is a list of the historical SSR events in ERCOT:

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| **Year** | **Area of SSR Events** | **Number of SSR Events** |
| 2009 | South TX | 1 |
| 2017 | South TX | 2 |
| 2018 | South TX | 1 |
| 2023 | South TX | 3 |
| North TX | 1 |

Due to the risk SSR and subsynchronous ferroresonance events pose to the ERCOT System, future generators should not interconnect on a series compensated circuit such that an N-1 condition would cause the generator to become radial to a series capacitor.   Below is a list of the station locations of Transmission Service Provider- (TSP) owned series capacitors:

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| **Locations of TSP-Owned Series Capacitors** |
| ROMNEY - Romney Capacitor Yard 345 kV |
| KOPPERL - Kopperl Capacitor Yard 345 kV |
| KIRCHHOF - Kirchhoff 345 kV |
| EDISON - Edison 345 kV |
| OERSTED - Orsted 345 kV |
| GAUSS - Gauss 345 kV |
| CTT\_CROS - CTT Cross SC 345 kV |
| NEDIN - North Edinburg 345 kV |
| RIOHONDO - Rio Hondo 345 kV |
| CENIZO - Cenizo 345 kV |
| DELSOL - Del Sol 345 kV |

ERCOT proposes that this PGRR take effect no sooner than April 1, 2025, to allow for an appropriate window for in-process generator interconnections/modifications to continue under the current Planning Guide language before these restrictions are enforced. |
| ROS Decision | On 11/7/24, ROS voted unanimously to table PGRR120 and refer the issue to the Planning Working Group (PLWG) and Dynamics Working Group (DWG). All Market Segments participated in the vote.On 6/5/25, ROS voted unanimously to recommend approval of PGRR120 as amended by the 5/20/25 PLWG comments. All Market Segments participated in the vote. |
| Summary of ROS Discussion | On 11/7/24, ERCOT Staff provided an overview of PGRR120. Participants requested additional review by PLWG and DWG.On 6/5/25, participants reviewed the 5/20/25 PLWG comments. |

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| **Opinions** |
| **Credit Review** | Not applicable |
| **Independent Market Monitor Opinion** | To be determined |
| **ERCOT Opinion** | To be determined |
| **ERCOT Market Impact Statement** | To be determined |

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| Market Segment | Not applicable  |

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| **Comments Received** |
| **Comment Author** | **Comment Summary** |
| Southern Power 121724 | Proposed additional clarifying revisions related to the timing of communication of cancellation of a proposed interconnection project, and to allow for interconnections to proceed if observed SSO has been fully mitigated to ERCOT’s reasonable satisfaction |
| AEP 012825 | Proposed revisions allowing new generator interconnections to connect near series capacitors if the system is reinforced such that the location is no longer N-1 radial through a series capacitor, along with other minor clarifications |
| Lone Star 020725 | Proposed revisions providing exceptions for generators and to allow TSPs to propose mitigations to eliminate SSO risks in both the near-term and long-term |
| Splight 021325 | Proposed additional revisions to the 2/7/25 Lone Star comments expanding the mitigation activities to generators as well as the TSPs and providing additional mitigation options |
| Enel Green Power 031425 | Proposed additional revisions to the 1/28/25 AEP comments merging them with language proposed in the 2/7/25 Lone Star comments |
| Smart Wires 032525 | Proposed revisions largely mirroring the 2/7/25 Lone Star comments with a modified list of potential SSO mitigation options |
| ERCOT 041625 | Proposed revisions to the 12/17/24 Southern Power comments consolidating the various formal comments and stakeholder discussions regarding PGRR120 |
| Lone Star and AEP 051425 | Opposed the 4/16/25 ERCOT comments |
| PLWG 052025 | Proposed revisions to the 4/16/25 ERCOT comments modifying the applicability of Section 5.2.10 from September 1, 2025 to April 1, 2026 |

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| Market Rules Notes |

Please note the baseline Planning Guide language in the following sections(s) has been updated to reflect the incorporation of the following PGRR(s) into the Planning Guide:

* PGRR118, Related to NPRR1246, Energy Storage Resource Terminology Alignment for the Single-Model Era (incorporated 4/1/25)
	+ Section 5.3.1

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| Proposed Guide Language Revision |

***5.2.10 Subsynchronous Oscillation (SSO) Risk Reduction***

(1) Any generator with a Standard Generation Interconnection Agreement (SGIA) executed on or after April 1, 2026, shall not be connected to the ERCOT Transmission Grid if the number of Credible Single Contingencies causing the generator to become radial to a series capacitor post contingency is less than or equal to one.

(2) A proposal to modify a generator connected to the ERCOT Transmission Grid, as described in paragraph (1)(c) of Section 5.2.1, that is interconnected such that a Credible Single Contingency causes the generator to become radial to a series capacitor shall not proceed to energization unless simulations demonstrate that Subsynchronous Oscillation (SSO) is not observed or, if SSO is observed, the Resource Entity for the generator has demonstrated to ERCOT’s reasonable satisfaction that SSO has been fully mitigated.

(3) If any SSO is observed during operations, ERCOT may prohibit the generator from operating until it is demonstrated to ERCOT’s reasonable satisfaction that SSO has been fully mitigated.

***5.3.1 Security Screening Study***

(1) For each Generator Interconnection or Modification (GIM) submitted for a large generator, ERCOT will conduct a steady-state Security Screening Study, including power-flow and transfer studies, based on the expected in-service year to identify potential generation dispatch limitations based on the site proposed by the Interconnecting Entity (IE).

(a) The Security Screening Study is a high-level review of the project and generally includes a number of initial assumptions from both ERCOT and the IE. In accordance with 16 Tex. Admin. Code § 25.198, Initiating Transmission Service, ERCOT will establish the scope of the Security Screening Study that will include a determination of the need for a more in-depth Subsynchronous Resonance (SSR) study. The SSR vulnerability of all Generation Resources applicable under Section 5, Generator Interconnection or Modification, will be assessed pursuant to Protocol Section 3.22.1.2, Generation Resource or Energy Storage Resource Interconnection Assessment.

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| ***[PGRR118: Replace paragraph (a) above with the following upon system implementation of NPRR1246:]***(a) The Security Screening Study is a high-level review of the project and generally includes a number of initial assumptions from both ERCOT and the IE. In accordance with 16 Tex. Admin. Code § 25.198, Initiating Transmission Service, ERCOT will establish the scope of the Security Screening Study that will include a determination of the need for a more in-depth Subsynchronous Resonance (SSR) study. The SSR vulnerability of all Generation Resources and Energy Storage Resources (ESRs) applicable under Section 5, Generator Interconnection or Modification, will be assessed pursuant to Protocol Section 3.22.1.2, Generation Resource or Energy Storage Resource Interconnection Assessment.  |

(b) At its sole discretion, ERCOT may waive the requirement for a Security Screening Study for a GIM.

(2) The results of the Security Screening Study will provide an indication of the level at which the proposed generator can expect to operate simultaneously with other known generators in the area before significant transmission additions or enhancements may be required. During the course of the Security Screening Study, ERCOT may consult with the affected Transmission Service Provider (TSP), if needed, to identify the most efficient means of providing transmission service.

(3) During the Security Screening Study phase of the GIM process, and in accordance with the Protocols, all data, documents, and other information required by ERCOT from an IE related to a request for interconnection are considered Protected Information pursuant to Protocol Section 1.3.1.1, Items Considered Protected Information, to the extent that such information is not otherwise publicly available. Accordingly, ERCOT shall not publicly release any of the protected data, documents, or other information during the Security Screening Study phase except to TSPs. Information about interconnection requests in the Security Screening Study phase will only be released publicly in aggregated amounts.

(4) Upon completion of the Security Screening Study, ERCOT will present the IE with a preliminary report that will inform the IE about the suitability of the proposed Point of Interconnection (POI) for the proposed MW amount. This report does not imply any commitment by ERCOT or any TSP to recommend or construct transmission additions or enhancements. The report will also contain a description of the SSR assessment performed as part of the Security Screening Study and any conclusions resulting from the SSR assessment, including the number of identified Credible Single Contingencies that would cause a generator to become radial to a series capacitor and ERCOT’s determination of whether it meets the requirements of paragraph (1) of Section 5.2.10, Subsynchronous Oscillation (SSO) Risk Reduction.

(5) Within 180 days of the date ERCOT notifies the IE of the Security Screening Study results, the IE must notify ERCOT, via the online Resource Integration and Ongoing Operations (RIOO) system, of its desire to pursue an FIS, otherwise ERCOT shall consider the GIM withdrawn by the IE. ERCOT will begin initiation and coordination of the FIS only after receiving this Notification and all required items from the IE for the FIS application to be approved. TSPs will receive a RIOO system automated email when ERCOT determines the FIS application is complete.

(6) After the expiration of the 180-day period, an IE must submit a new GIM for a Security Screening Study and must again pay the appropriate fee. The IE will also be required to submit any updates or changes in the project’s data to ERCOT.

(7) For any interconnection request that proposes either a large generator that would be interconnected at distribution voltage or a qualifying modification to a large generator that is interconnected at distribution voltage, ERCOT will not initiate a Security Screening Study or propose any FIS kickoff meeting until the IE first provides written confirmation from the affected Distribution Service Provider (DSP) stating that the DSP has evaluated the proposed project, determined that the interconnection of the generator at distribution voltage is electrically feasible, and identified the necessary upgrades to accommodate the proposed interconnection. In conducting a Security Screening Study for such an interconnection request, ERCOT shall evaluate only the transmission-level impacts, if any, of the proposed generator, and the affected DSP shall provide ERCOT any information concerning the DSP’s facilities or the proposed generator interconnection as may be requested by ERCOT for the purpose of completing the Security Screening Study.