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| PGRR Number | [120](https://www.ercot.com/mktrules/issues/PGRR120) | PGRR Title | SSO Prevention for Generator Interconnection |

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| Date | April 16, 2025 |

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| Submitter’s Information | |
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| Market Segment | Not applicable |

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| Comments |

ERCOT appreciates the opportunity to provide comments to Planning Guide Revision Request (PGRR) 120 and submits language revisions on top of those submitted by Southern Power’s comments on December 17, 2024 and in response to informal comments received from Oncor Electric Delivery Company LLC.

ERCOT is supportive of Southern Power’s comments and has included them in this submission, with certain proposed alignment edits.

In addition, ERCOT has included the following edits:

1. Removing paragraphs (1)(a) and (1)(b) of Section 5.2.10, Subsynchronous Oscillation (SSO) Prevention, and replacing with “For any proposed generator with a Standard Generation Interconnection Agreement (SGIA) executed on or after September 1, 2025…” This is to simplify and maintain consistency with existing grandfathering clauses in the Protocols and Market Guides.
2. Adding clarification to Section 5.2.10 to ensure the requirement is applicable only to generators connecting to the ERCOT Transmission Grid. ERCOT acknowledges that the proposed language would not apply to distribution-connected generation due to the number of contingencies away such generation is from series capacitors.

ERCOT has reviewed the comments submitted by American Electric Power (AEP) on January 28, 2025, and offers the following responses:

1. ERCOT accepts the section name change to refer to “Risk Reduction” rather than “Prevention.” However, as explained at the January 29, 2025 Planning Working Group (PLWG) meeting, ERCOT recommends that “SSO” be maintained rather than SSR because SSO includes Subsynchronous Ferroresonance (SSFR) which must also be addressed. Upon approval, Nodal Protocol Revision Request (NPRR) 1234, Interconnection Requirements for Large Loads and Modeling Standards for Loads 25 MW or Greater, changes the name of Protocol Section 3.22, Subsynchronous Resonance, to Subsynchronous Oscillation, and adds the definition of SSFR as a type of SSO in Protocol Section 2.1, Definitions. Therefore, ERCOT finds it appropriate to utilize the overarching term “SSO” here.
2. The proposal to change paragraph (1) from “subject to cancellation” to “cause that generator to bear the cost of....identified SSR mitigation, including but not limited to greenfield transmission....” is redundant and unnecessary given existing requirements and furthermore, if adopted, would effectively eliminate the need for PGRR120. A generator funding option for transmission already exists in Protocol Section 3.11.4.11, Customer or Resource Entity Funded Transmission Projects. Additionally, paragraph (1) of Section 5.5, Generator Commissioning and Continuing Operations, already requires that Interconnecting Entities must meet the conditions established by ERCOT prior to proceeding to energization, synchronization, and commercial operations, which may include SSO mitigation.
3. ERCOT has removed the “subject to cancellation” reference since it is not necessary to cancel a project proposal. In regard to the process if a generator project was to submit an interconnection request (“INR”) to interconnect at a Point of Interconnection (POI) that would violate the requirements of 5.2.10, ERCOT Resource Integration would identify the issue and inform the generator. The generator would then be able to evaluate options either to move forward with the current INR after making changes such that the requirements would no longer be violated, such as if the generator chooses to pay for an additional transmission line such that it would not be interconnected radially, or to submit a new INR with a different Point of Interconnection (POI).
4. ERCOT has edited the language of Paragraph (1) of Section 5.2.10 for clarification to now read: “…the number of Credible Single Contingencies causing the generator to become radial to a series capacitor post contingency less than or equal to one.” This captures the primary goal of the PGRR which is to prevent future generation from directly interconnecting to the series compensated circuits.

ERCOT has reviewed the comments submitted by Lone Star Transmission, LLC (Lone Star) on February 7, 2025, Splight Inc. on February 13, 2025, Enel Green Power North America on March 14, 2025, and Smart Wires Inc. on March 25, 2025, and offers the following responses:

1. Existing SSO risks are not being identified in studies and have led to Real-Time events.
2. This is not the appropriate location to detail which kinds of SSR mitigation are allowed. It is also important to keep in mind that more generation interconnecting to these circuits will make SSO mitigation even more challenging. A new generator interconnecting nearby can adversely impact the SSO mitigation and tuning for existing generation.
3. SSR mitigations that include breaker reconfiguration are only temporary solutions under very specific circumstances. When utilized, breaker reconfiguration is not a permanent, nor a sustainable, operating condition.
4. Transmission Service Providers (TSPs) currently have the authority to reduce SSO risk with switching mechanisms such as the cross-tripping of series capacitors for credible N-1 conditions. There is a need for a wholistic approach to resolve the growing issues related to SSO. This means that in addition to SSR issues post-contingency, SSFR also needs to be a consideration, pre- and post-contingency.
5. The Planning Guide is not the appropriate location for establishing a process for “eliminating the need” for series capacitors via projects. The Protocols would be an appropriate location to officially document those kinds of processes.

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| Revised Cover Page Language |

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| PGRR Number | [120](https://www.ercot.com/mktrules/issues/PGRR120) | PGRR Title | SSO Risk Reduction for Generator Interconnection |
| Planning Guide Sections Requiring Revision | | 5.2.10, Subsynchronous Oscillation (SSO) Risk Reduction (new)  5.3.1, Security Screening Study | |

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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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| Revised Proposed Guide Language |

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

(1) Any generator with a Standard Generation Interconnection Agreement (SGIA) executed on or after September 1, 2025, 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.