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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 | January 28, 2025 |

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| Market Segment | Investor-Owned Utility (IOU) |

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| Comments |

AEP appreciates the opportunity to submit comments on Planning Guide Revision Request (PGRR) 120. AEP recognizes that Subsynchronous Oscillation (SSO) / Subsynchronous Resonance (SSR) presents a serious threat to system reliability and agrees with ERCOT that something must be done to mitigate the risk of SSR, particularly at high-risk Points of Interconnection (POIs). AEP proposes reducing risk of SSR by reinforcing the transmission system through increased networking rather than by canceling the generator interconnection request.

In short, AEP proposes the following modifications to PGRR120:

Continue to allow 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.

Benefits:

1. This reduces the risk of SSR for that generator and other existing or future generators in the same area by making the system more interconnected (this helps to resolve, instead of avoid, the SSR issue).
2. This does not restrict use of these open access transmission facilities or limit POIs.
3. This continues to enable and encourage much needed generation investment and reinforces the Transmission grid.

Concerns:

1. This is not full prevention of the SSO issues on the grid. SSO is still a concern beyond N-1 radial conditions and independently of series capacitors.
2. This has the potential to impact previously designed SSR mitigations, in particular control tuning. This adds to the complexity of solution development for the generator interconnection.
3. This could take a long time in SSR analysis progressing the mitigation through the stakeholder process. This will significantly delay the time to interconnection compared to other POIs, and generator developers should be made aware of that fact up front.

Two final minor comments:

1. It seems that there was a typo in the original proposed PGRR120 language to achieve the intended effect: “if the number of Credible Single Contingencies causing the generator to become radial to a series capacitor(s) post contingency is ~~not~~ greater than ~~one~~zero.”
2. PGRR120 refers to “SSO”, however based on the definitions proposed in NPRR 1234, Interconnection Requirements for Large Loads and Modeling Standards for Loads 25 MW or Greater, PGRR120 language should be modified to “SSR”; these definitions are included below for reference. Additionally, for consistency, Section 3.22, Subsynchronous Resonance, currently refers to “Subsynchronous Resonance (SSR)”.

Subsynchronous Oscillation (SSO)

Coincident oscillation occurring between two or more Transmission Elements or Generation Resources at a natural harmonic frequency lower than the normal operating frequency of the ERCOT System (60 Hz).

Subsynchronous Resonance (SSR)

Coincident oscillation occurring between Generation Resources and a series capacitor compensated transmission system at a natural harmonic frequency lower than the normal operating frequency of the ERCOT System (60 Hz), including the following types of interactions…

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| Revised Cover Page Language |

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| Planning Guide Sections Requiring Revision | 5.2.10, Subsynchronous Resonance (SSR) Risk Reduction (new) |

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| Revised Proposed Guide Language |

***5.2.10 Subsynchronous Resonance (SSR) Risk Reduction***

(1) A proposal to interconnect a generator, as described in paragraph (1)(a) or (1)(b) of Section 5.2.1, Applicability, will cause that generator to bear the cost of ERCOT and TSP identified SSR mitigation, including but not limited to greenfield transmission, if the number of Credible Single Contingencies causing the generator to become radial to a series capacitor(s) post contingency is greater than zero. Credible Single Contingencies will be determined as follows:

(a) Large generators shall have the number of Credible Single Contingencies that cause a generator to become radial to a series capacitor(s) determined during the topology-check in the Security Screening Study, as described in Section 5.3.1, Security Screening Study.

(b) Small generators shall have the number of Credible Single Contingencies that cause a generator to become radial to a series capacitor(s) determined by the TDSP.

(2) A proposal to modify a generator, 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(s) shall be allowed only if simulations demonstrate that Subsynchronous Resonance (SSR) is not observed or that generator bears the cost of ERCOT and TSP identified SSR mitigation, including but not limited to greenfield transmission.

(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.