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| NPRR Number | [1044](http://www.ercot.com/mktrules/issues/nprr1044) | NPRR Title | Enhancement of SSR Mitigation Requirement  |
| Date of Decision | February 9, 2021 |
| Action | Approved |
| Timeline | Normal |
| Effective Date | March 1, 2021 |
| Priority and Rank Assigned | Not applicable |
| Nodal Protocol Sections Requiring Revision  | 3.22.1.2, Generation Resource Interconnection Assessment  |
| Related Documents Requiring Revision/Related Revision Requests | None |
| Revision Description | This Nodal Protocol Revision Request (NPRR) requires Generation Resources and Energy Storage Resources (ESRs) to develop and implement Subsynchronous Resonance (SSR) Mitigation plans to address SSR vulnerabilities in the event of six or fewer concurrent transmission Outages, instead of the current threshold of four or fewer Outages. Generation Resources and ESRs that satisfied Planning Guide Section 6.9, Addition of Proposed Generation to the Planning Models, before September 1, 2020 would be allowed to elect SSR monitoring to address SSR vulnerabilities in the event of five or six concurrent transmission Outages. |
| Reason for Revision |  Addresses current operational issues. Meets Strategic goals (tied to the [ERCOT Strategic Plan](http://www.ercot.com/content/wcm/lists/144926/ERCOT_Strategic_Plan_2019-2023.pdf) or directed by the ERCOT Board). Market efficiencies or enhancements Administrative Regulatory requirements Other: (explain)*(please select all that apply)* |
| Business Case | SSR monitoring was originally intended to be available only to a small number of Generation Resources in existence at the time series capacitors were installed to improve transfer capability. ERCOT is experiencing an increase in the number of SRR monitoring schemes because Generation Resources are electing to not implement SSR Mitigation plans for N-5 and N-6 SSR vulnerabilities. This can lead to an increase in the number of operator actions necessary to address SSR concerns identified in Outage coordination and Real-Time operations. These actions could involve bypassing series capacitors which would affect power transfer capability and Generic Transmission Constraints (GTCs). As the number of SSR monitoring schemes increases, generation curtailment will become more likely.A recent review of proposed generator interconnections identified at least seven projects that would be radial to series capacitors under N-5 or N-6 conditions. This may necessitate the development of at least seven additional Outage coordination and monitoring procedures. This would be a significant increase over the four currently implemented SSR monitoring procedures.  |
| Credit Work Group Review | ERCOT Credit Staff and the Credit Work Group (Credit WG) have reviewed NPRR1044 and do not believe that it requires changes to credit monitoring activity or the calculation of liability. |
| PRS Decision | On 10/15/20, PRS unanimously voted via roll call to table NPRR1044 and refer the issue to ROS. All Market Segments were present for the vote. On 12/10/20, PRS unanimously voted via roll call to recommend approval of NPRR1044 as amended by the 11/23/20 ERCOT comments. All Market Segments were present for the vote.On 1/14/21, PRS voted via roll call to endorse and forward to TAC the 12/10/20 PRS Report and the Impact Analysis for NPRR1044. There was one abstention from the Independent Power Marketer (IPM) (Morgan Stanley) Market Segment. All Market Segments were present for the vote. |
| Summary of PRS Discussion | On 10/15/20, ERCOT Staff provided an overview of NPRR1044. Market Participants requested additional examples from studies or system observations in order to develop a better understanding of the justification for the revisions.On 12/10/20, ERCOT Staff reviewed the 11/23/20 ERCOT comments.On 1/14/21, there was no discussion. |
| TAC Decision | On 1/27/21, TAC unanimously voted via roll call to recommend approval of NPRR1044 as recommended by PRS in the 1/14/21 PRS Report. All Market Segments were present for the vote. |
| Summary of TAC Discussion | On 1/27/21, there was no discussion. |
| ERCOT Opinion | ERCOT supports approval of NPRR1044. |
| Board Decision | On 2/9/21, the ERCOT Board approved NPRR1044 as recommended by TAC in the 1/27/21 TAC Report. |

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| Market Segment | Not applicable |

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| **Comments Received** |
| Comment Author | **Comment Summary** |
| ROS 110620 | Requested PRS continue to table NPRR1044 to allow for review by the Planning Working Group (PLWG) and Dynamics Working Group (DWG) |
| ERCOT 112320 | Provided additional information requested by PLWG regarding justification for enhancement of SSR Mitigation requirements and the September 1, 2020 date; and included administrative corrections to Revision Description |
| ROS 120420 | Endorsed NPRR1044 as amended by the 11/23/20 ERCOT comments |

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| **Market Rules Notes** |

None

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| Proposed Protocol Language Revision |

**3.22.1.2 Generation Resource or Energy Storage Resource Interconnection Assessment**

(1) In the security screening study for a Generation Resource Interconnection or Change Request, ERCOT will perform a topology-check and determine if the Generation Resource or Energy Storage Resource (ESR) will become radial to a series capacitor(s) in the event of fewer than 14 concurrent transmission Outages.

(2) If ERCOT identifies that a Generation Resource or ESR will become radial to a series capacitor(s) in the event of fewer than 14 concurrent transmission Outages, the interconnecting TSP shall perform an SSR study including frequency scan assessment and/or detailed SSR assessment for the Interconnecting Entity (IE) in accordance with Section 3.22.2, Subsynchronous Resonance Vulnerability Assessment Criteria, to determine SSR vulnerability. The SSR study shall determine which system configurations create vulnerability to SSR. Alternatively, if the IE can demonstrate to ERCOT’s and the interconnecting TSP’s satisfaction that the Generation Resource or ESR is not vulnerable to SSR, then the interconnecting TSP is not required to perform the SSR study. If an SSR study is conducted, the interconnecting TSP shall submit it to ERCOT upon completion and shall include any SSR Mitigation plan developed by the IE that has been reviewed by the TSP.

(3) If the SSR study performed in accordance with paragraph (2) above indicates that the Generation Resource or ESR is vulnerable to SSR in the event of six or fewer concurrent transmission Outages, the IE shall develop an SSR Mitigation plan, provide it to the interconnecting TSP for review and inclusion in the TSP’s SSR study report to be approved by ERCOT, and implement the SSR Mitigation prior to Initial Synchronization.

(a) If the SSR study performed in accordance with paragraph (2) above indicates that the Generation Resource or ESR is vulnerable to SSR in the event of four concurrent transmission Outages, the IE may install SSR Protection in lieu of SSR Mitigation, as required by paragraph (3) above, if:

(i) The Generation Resource or ESR satisfied Planning Guide Section 6.9, Addition of Proposed Generation to the Planning Models, between August 12, 2013 and March 20, 2015;

(ii) The SSR Protection is approved by ERCOT; and

(iii) The Generation Resource or ESR installs the ERCOT-approved SSR Protection prior to Initial Synchronization.

(b) For any Generation Resource or ESR that satisfied Planning Guide Section 6.9 before September 1, 2020, if the SSR study performed in accordance with paragraph (2) above indicates that the Generation Resource or ESR is vulnerable to SSR in the event of five or six concurrent transmission Outages, the IE may elect not to develop or implement an SSR Mitigation plan, in which case ERCOT shall implement SSR monitoring in accordance with Section 3.22.3, Subsynchronous Resonance Monitoring. The IE shall provide ERCOT written Notice of any such election before the Generation Resource or ESR achieves Initial Synchronization, and the Generation Resource or ESR shall not be permitted to proceed to Initial Synchronization until ERCOT has implemented SSR monitoring.

(4) ERCOT shall respond with its comments or approval of an SSR study report, which should include any required SSR Mitigation plan, within 30 days of receipt. ERCOT comments should be addressed as soon as practicable by the TSP, and any action taken in response to ERCOT’s comments on an SSR study report shall be subject to further ERCOT review and approval. Upon approval of the SSR study report, ERCOT shall notify the interconnecting TSP, and the interconnecting TSP shall provide the approved SSR study report to the IE.