|  |  |  |  |
| --- | --- | --- | --- |
| NPRR Number | [1280](https://www.ercot.com/mktrules/issues/NPRR1280) | NPRR Title | Establish Process for Permanent Bypass of Series Capacitor |
|  |  |  |  |
| Date of Decision | July 28, 2025 |
|  |  |
| **Submitter’s Information** |
| Name | Nihal Mohan / Aditi Upadhyay & Constance McDaniel Wyman / Erin Rasmussen / Mary Berkley |
| E-mail Address | Nihal.mohan@lonestar-transmission.com; aditi.upadhyay@lonestar-transmission.com; cmcdanielwyman@aep.com; ejrasmussen@aep.com; msberkley@aep.com |
| Company | Lone Star Transmission, LLC (LST) & American Electric Power (AEP) |
| Phone Number | LST:(561) 603-3970 / (512) 599-2603; AEP: (614) 716-2434 / (918) 606-7106 |
| Market Segment | Investor-Owned Utility (IOU) |

|  |
| --- |
| Comments |

Lone Star Transmission (LST) and American Electric Power (AEP), for AEP Texas and ETT, appreciate the opportunity to provide formal comments regarding Nodal Protocol Revision Request (NPRR) 1280. These comments are filed on top of the 7/8/25 TIEC comments. While both organizations support the establishment of a formal review process for proposals to permanently bypass series capacitors, LST and AEP respectfully submit that NPRR1280 requires additional specificity, and LST and AEP seek to address the comments made by TIEC regarding economic analysis of these projects.

LST and AEP offer additional language concerning the justification for this capacitor bank bypassing process to enhance the clarity and effectiveness of NPRR 1280:

ERCOT should clearly specify that these projects are reliability projects for the purpose of preventing Subsynchronous Oscillations (SSO); clarifying language is proposed for paragraph (d)(ii) of Section 3.11.4.3, Categorization of Proposed Transmission Projects.

The series capacitors were placed in service on the ERCOT Bulk Electric System as a result of the Competitive Renewable Energy Zone (CREZ) Reactive Compensation Study, which was completed in 2010. ERCOT’s filing of that report in Public Utility Commission of Texas (PUCT) Project No. 33672 stated, “This set of reactive devices will provide sufficient dynamic and static reactive capability to reliably operate the CREZ transmission circuits, while maintaining sufficient flexibility to expand reactive capability to meet growing system needs.” In the ensuing years, after the installation of these devices on the Bulk Electric System, the system topology has changed in such a way that there is now negative interaction between these devices and generation resources, particularly Inverter-Based Resources (IBRs), resulting in SSO, which is a reliability and stability issue for the Bulk Electric System.

LST and AEP would also like to address comments made by stakeholders at the June 17, 2025 Planning Working Group (PLWG) meeting and in the 7/8/25 TIEC comments that projects submitted under this proposed process should undergo an economic review. LST and AEP do not see it as an appropriate approach. As noted above, these devices were installed to meet a reliability need. First, and paramount, we should not create nor sustain reliability issues on the grid based on an economic test.

Additionally, the existing economic tests at ERCOT would be inappropriate for the assessment of projects proposed under this NPRR, even if stakeholders were inclined to such an assessment. The current economic tests for Regional Planning Group (RPG) projects are the production cost savings test and the congestion cost savings test. Both tests evaluate the calculated benefit against the first (or first three) year’s revenue requirement to determine whether ratepayers should invest in the proposed facilities. In the case of existing series capacitors, ratepayers have already purchased these facilities and the years against which the benefits would be compared occurred more than a decade ago. Further, the model upon which the current economic test benefits are calculated does not account for the amount of Real-Time Outages and curtailments associated with oscillation events. LST and AEP acknowledge that there would be some flow changes with the removal of the series caps, but simply taking the cap banks out and measuring resultant flow changes would be an inaccurate method of assessment.

Lastly, LST and AEP agree with ERCOT’s original assertion that this should be a Tier 3 project. The costs that would be associated with the bypass of these projects typically would fall into the existing Tier 3 classification and would not qualify as Tier 2 Projects because they do not require large capital investment or require a Certificate of Convenience and Necessity (CCN).

These projects would be to address specific reliability concerns related to SSO and address Real-Time incidents to support more reliable system operations. LST and AEP request ERCOT's consideration of these recommendations.

|  |
| --- |
| Revised Cover Page Language |

|  |  |
| --- | --- |
| **Justification of Reason for Revision and Market Impacts** | The ERCOT System currently has 18 series capacitors installed in the 345 kV transmission network, to primarily enhance power transfer capability and provide voltage support by reducing impedance of the transmission lines between generation and major load centers. While series capacitors improve power transfer efficiency, they also introduce the risk of Subsynchronous Oscillation (SSO)—an abnormal energy interaction at frequencies below the normal operating frequency of 60 Hz. SSO can cause severe damage to generator shafts, series capacitors, and other system components, potentially leading to equipment failures and cascading outages. The risk of SSO increases as more generation or Large Load are located near existing series capacitors. In many cases, major transmission upgrades—such as new 345 kV transmission lines already approved or under construction—can effectively replace the original purpose of series capacitors. As a result, certain series capacitors may become redundant, less critical, or unnecessary following such major transmission upgrades. The current RPG process does not include a formal review process for proposals to permanently bypass or un-bypass existing series capacitor(s). This NPRR requires that these projects be classified and reviewed as Tier 3 projects, with reclassification as Tier 4 neutral projects once any concerns are resolved, ensuring they become subject to RPG Project Review. This clear and structured approach will enhance transparency and coordination by providing RPG stakeholders the opportunity to review and provide comments. Also, efficiencies will be gained in the SSO study process as permanently bypassed series capacitors would no longer be considered capable of becoming radial to Generation Resources or Large Loads. |

|  |
| --- |
| Revised Proposed Protocol Language |

3.11.4.3 Categorization of Proposed Transmission Projects

(1) ERCOT classifies all proposed transmission projects into one of four categories (or Tiers). Each Tier is defined so that projects with a similar cost and impact on reliability and the ERCOT market are grouped into the same Tier. For Tier classification, the total estimated cost of the project shall be used which includes costs borne by another party.

(a) A project shall be classified as Tier 1 if the estimated capital cost is greater than or equal to $100,000,000, unless the project is considered to be a neutral project pursuant to paragraph (f) below.

(b) A project shall be classified as Tier 2 if the estimated capital cost is less than $100,000,000 and a Certificate of Convenience and Necessity (CCN) is required, unless the project is considered to be a neutral project pursuant to paragraph (f) below.

(c) A project shall be classified as Tier 3 if any of the following are true:

(i) The estimated capital cost is less than $100,000,000 and greater than or equal to $25,000,000 and a CCN is not required, unless the project is considered to be a neutral project pursuant to paragraph (f) below; or

(ii) The estimated capital cost is less than $25,000,000, a CCN is not required, and the project includes 345 kV circuit reconductor of more than one mile, additional 345/138 kV autotransformer capacity, or a new 345 kV substation, unless the project is considered to be a neutral project pursuant to paragraph (f) below.

(d) A project shall be initially classified as Tier 3 if it meets any of the following conditions and shall subsequently be reclassified as a Tier 4 neutral project upon ERCOT’s determination that any concerns, questions, or objections raised during the comment process have been resolved satisfactorily:

(i) The estimated capital cost is greater than or equal to $25,000,000, and it is proposed for the purpose of replacing aged infrastructure or storm hardening; or

(ii) The estimated capital cost is less than $25,000,000, and it involves mitigating reliability issues due to Subsynchronous Oscillation (SSO) by the permanent bypass of an existing series capacitor or un-bypassing of a series capacitor that was previously designated as permanently bypassed.

(e) A project shall be classified as Tier 4 if it does not meet the requirements to be classified as Tier 1, 2, or 3 or if it is considered a neutral project pursuant to paragraph (f) below.

(f) A project shall be considered a neutral project if it consists entirely of:

(i) The addition of or upgrades to radial transmission circuits;

(ii) The addition of equipment that does not affect the transfer capability of a circuit;

(iii) Repair and replacement-in-kind projects;

(iv) Transmission Facilities needed to connect a new Generation Resource, Energy Storage Resource (ESR), or Settlement Only Generator (SOG) to a new or existing substation on the existing ERCOT Transmission Grid, including the substation;

(v) The addition of static reactive devices;

(vi) A project to serve a new Load, unless such project would create a new transmission circuit connection between two stations (other than looping an existing circuit into the new Load-serving station);

(vii) Replacement of failed equipment, even if it results in a ratings and/or impedance change; or

(viii) Equipment upgrades resulting in only ratings changes.

(2) ERCOT may use its reasonable judgment to increase the level of review of a proposed project (e.g., from Tier 3 to Tier 2) from that which would be strictly indicated by these criteria, based on stakeholder comments, ERCOT analysis or the system impacts of the project.

(a) A project with an estimated capital cost greater than or equal to $50,000,000 that requires a CCN shall be reclassified and processed as a Tier 1 project upon request by a Market Participant during the comment period per Planning Guide Section 3.1.5, Regional Planning Group Comment Process.

(3) Any project that would be built by an Entity that is exempt (e.g., a Municipally Owned Utility (MOU)) from getting a CCN for transmission projects but would require a CCN if it were to be built by a regulated Entity will be treated as if the project would require a CCN for the purpose of defining the Tier of the project.

(4) If during the course of ERCOT’s independent review of a project, the project scope changes, ERCOT may reclassify the project into the appropriate Tier.