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| NPRR Number | [1280](https://www.ercot.com/mktrules/issues/NPRR1280) | NPRR Title | Establish Process for Permanent Bypass of Series Capacitor |
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| Date | | August 19, 2025 | |
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| **Submitter’s Information** | | | |
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| Phone Number | | 512-248-4159 | |
| Market Segment | | Not Applicable | |

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| Comments |

ERCOT submits these comments in response to the 7/8/25 TIEC comments, as well as the 7/28/25 LST and AEP comments. ERCOT also proposes a revision to Nodal Protocol Revision Request (NPRR)1280.

1. TIEC recommended classifying projects to bypass or un-bypass series capacitors as Tier 2 rather than Tier 3. TIEC’s concern is that these projects may have significant impacts on grid reliability, congestion, and consumer costs that stakeholders may not consider holistically. Classifying such projects as Tier 2 would require ERCOT by default to conduct an independent analysis of both the reliability and economic impacts of such projects to provide such holistic review.

* **ERCOT Response**: ERCOT appreciates TIEC’s comments, however ERCOT believes that the initial classification of such projects as Tier 3 for submission to the Regional Planning Group (RPG) remains appropriate because: a) these projects are not anticipated to be in the typical cost range of a Tier 2 RPG project nor are they anticipated to require new right of way; and b) Tier 3 classification still ensures transparency by allowing stakeholders to review and provide any comments as provided in Section 3.11.4.5, Processing of Tier 3 Projects.

Regardless of the Tier classification, to address TIEC’s feedback ERCOT has revised NPRR1280 in these comments to include a requirement that ERCOT conduct an economic analysis for this project type. This change ensures that stakeholders do not have to affirmatively request such an analysis and will help stakeholders consider holistic potential impacts on congestion costs and production costs.

ERCOT believes that the reliability impact analysis provided by the Transmission Service Provider (TSP) as part of the project proposal to RPG offers sufficient technical information for stakeholder review as these studies are conducted in accordance with North American Electric Reliability Corporation (NERC) Reliability Standards and the ERCOT Planning Guide.

Additionally, ERCOT and the submitting TSP will coordinate prior to submission of the project for RPG Project Review, which will allow ERCOT’s economic analysis to be included with the TSP’s project submission to RPG. This coordinated approach ensures that the projects are supported by both reliability and economic analyses during the RPG Project Review process.

1. TIEC raised concerns about reported instances where ERCOT Operations has requested that utilities bypass existing series capacitors during real-time operations. TIEC requested more transparency around how often these bypasses occur, which capacitors are typically involved, and what analysis ERCOT conducts beforehand—particularly regarding reliability and consumer impacts.

* **ERCOT Response**: ERCOT may take actions such as switching or system reconfiguration in real time when necessary to maintain system reliability. For example, during a maintenance outage of certain transmission lines, some generators may become electrically closer to nearby existing series capacitors, potentially creating a risk of Subsynchronous Oscillation (SSO). To allow the maintenance outage while ensuring reliability, ERCOT Operations may temporarily bypass the affected series capacitor in accordance with paragraph (2)(d) of Section 3.22.3, Subsynchronous Resonance Monitoring. Additionally, ERCOT maintains the [Transmission and Security Operating Procedure](https://www.ercot.com/mktrules/guides/procedures), available on ERCOT’s website, which outlines operational actions that may be taken such as energizing or bypassing existing series capacitors along with the supporting studies conducted prior to such actions.

Additionally, between 2017 and 2023, there were seven unexpected SSO events on the ERCOT System. In response, ERCOT directed the associated series capacitors to be bypassed until the root causes were investigated and appropriate mitigation measures implemented.

1. LST and AEP recommended in the 7/28/25 LST and AEP comments that the Protocols explicitly state that these projects are reliability-driven and intended to address SSO issues. They opposed requiring an economic analysis, noting that the series capacitors were installed over a decade ago to address past reliability needs and that existing economic tests are not appropriate for evaluating these projects. Applying such tests would be misleading, as the costs and benefits no longer align with current system conditions. LST and AEP also supported initial classification as Tier 3, given that these projects typically involve low costs, do not require major construction or regulatory approvals, and are intended to address real-time reliability issues rather than increase system capacity.

* **ERCOT Response**: For any reliability-driven project, ERCOT recommends that the reliability need be clearly stated in the TSP’s RPG submittal to ensure transparency for stakeholder review.

As noted in ERCOT’s response to TIEC’s comments, ERCOT continues to support the initial classification of these projects as Tier 3, since they are generally lower in cost, do not require new right of way, and still allow for stakeholder review and comment through the process outlined in Section 3.11.4.5. Additionally, ERCOT does not plan to endorse these projects.

ERCOT has revised NPRR1280, as noted in the response to TIEC, to include a requirement that ERCOT perform an economic analysis for this project type. The results of this analysis are intended for informational purposes only. The economic analysis is intended solely to improve transparency and provide information on any potential economic or congestion impacts. The economic analysis will not be used to assess economic justification for approving the project.

ERCOT also changed the language in paragraph (1)(d) of Section 3.11.4.3, Categorization of Proposed Transmission Projects from “*upon ERCOT’s determination that any concerns, questions or objections raised during the comment process have been resolved satisfactorily*” to “*once the comments process is complete*,” to clarify that ERCOT is not in a position to make a formal determination or resolution regarding the outcome of the comment process.

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| Revised Cover Page Language |

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| **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 initially 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 ensure there are robust studies to support a proposal, while still enhancing 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. |

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| 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 (g) 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 once the comment process is complete:(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 for storm hardening; or

(ii) The estimated capital cost is less than $25,000,000, and it involves the permanent bypass of an existing series capacitor or un-bypassing of a series capacitor that was previously designated as permanently bypassed. The relevant TSP shall coordinate with ERCOT prior to submission of the project for RPG Project Review, and ERCOT shall perform an economic analysis of the project for inclusion in the RPG project submission.

(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.