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RELIABILITY PLAN FOR THE PERMIAN BASIN UNDER PURA § 39.167	**§ § §**	**PUBLIC UTILITY COMMISSION OF TEXAS**

AEP COMPANIES' RESPONSES
TO COMMISSION STAFF'S QUESTIONS FOR STAKEHOLDER COMMENT
RELATED TO ERCOT'S RELIABILITY PLAN FOR THE PERMIAN BASIN

AEP Texas Inc. and Electric Transmission Texas, LLC (collectively "the AEP Companies") timely submit these responses to the questions posed by Staff of the Public Utility Commission of Texas on several aspects of the Electric Reliability Council of Texas's ("ERCOT") final Reliability Plan for the Permian Basin Region.[1] AEP Texas is a wholly owned subsidiary of American Electric Power Company, Inc. ("AEP"), and Electric Transmission Texas is a joint venture between AEP and Berkshire Hathaway Energy. Both companies operate in the ERCOT region of Texas.

In the Reliability Plan for the Permian Basin Region, ERCOT identified three import path options for the Commission's consideration: a traditional 345-kV option and two extra high voltage ("EHV") options: 500-kV and 765-kV.[2] While the ERCOT system currently has no lines above 345-kV, AEP has extensive experience operating and maintaining extra high voltage transmission, and is supportive of the Commission adopting a single, complete plan using the 765-kV option. AEP owns the nation's largest electric transmission system at over 40,000 miles, with over 8,000 miles of its 40,000-mile system operating above 300-kV. AEP currently operates 115 miles of 500-kV transmission lines and 2,200 miles of 765-kV transmission lines. AEP's experience with 765-kV lines dates back to the 1970s.

The results of ERCOT's study demonstrate that the EHV 765-kV performed the best by providing the highest transfer capability, requiring least number of new lines and new right-of-way, and allowing for a significant reduction in transmission line losses as compared to the 345-

[1] Project No. 55718, ERCOT Permian Basin Reliability Plan Study Report (July 25, 2024).

[2] The AEP Companies note that the term "extra high voltage" typically includes all transmission voltages above 300-kV. However, for purposes of these responses "extra high voltage" is used to mean 500-kV and above.

kV import path option. Another major benefit of using EHV lines, particularly at 765-kV, is that series compensation equipment is not required to effectively move power over long distances, and other reactive compensation devices are also typically not needed. There is no need to provide a mix of options that also includes lower-voltage lines. With this in mind, the AEP Companies appreciate the opportunity to participate in this discussion and respectfully offer the following responses to Commission Staff's questions.

I. Responses to Commission Staff's Questions

PLAN

1. Should the Commission approve a *phased* plan for the Permian Basin? In other words, should there be a first phase to be implemented by 2030 and a second phase to be implemented by 2038? Or should the Commission approve a single, complete plan?

No. The Commission should approve a single, complete plan that includes the entire plan through 2038 outlined in the Permian Basin Reliability Plan. There is no need to have a first phase implemented by 2030 and a second phase implemented by 2038 because the forecasted load between 2030 and 2038 is minimally different, and the system upgrades identified for 2030 and 2038 are the same. A phased approach would also increase the costs and the time it will take to connect the loads and generation sources that are currently waiting to connect in the Permian Basin region.

The Permian Basin Reliability Plan divided the system upgrades required in serving the forecasted load into two categories: Common Local Transmission Upgrades and Import Path Options. The first category, Common Local Transmission Upgrades, lists the transmission projects needed in interconnecting and serving the projected load in the Permian Basin Region. These transmission projects could be approved through 2038 without phasing given that most parameters driving these projects are known, and the upgrades are not directly impacted by the import path selected.

The second category, Import Path Options, identifies the import paths needed to transfer power to Permian Basin to serve the projected load and generation. The Import Path Options were evaluated utilizing 345-kV and EHV 500-kV and 765-kV transmission lines to meet Permian Basin Region import needs. Based upon ERCOT results of the EHV paths, the 765-kV import path option

performed the best by providing the highest transfer capability, requiring the least number of new lines and new right-of-way, and allowing for a significant reduction in transmission line losses as compared to the 345-kV import path option, and less risk of a stranded asset from the generation location assumptions included in the ERCOT model, at an estimated cost that is comparable or below the other options. By approving a single, complete plan now that includes the 765-kV import path option, the Commission can provide clear direction on the path forward and allow parties to immediately begin the necessary preparations for implementation including standards development and vendor identification. This will also provide notification to the manufacturers so that they can prepare to meet the increased demand.

The AEP Companies recommend the 765-kV import path option because it should be faster to execute, less impactful to Texas landowners, have a smaller environmental impact, and allow a faster regulatory process because it only requires three new lines to implement as compared to five new lines for the 345-kV import path option. In addition, the AEP Companies expect the lead times in the procurement for 765-kV equipment to be similar to the lead times for 345-kV equipment.

2. To expedite the buildout of import paths into the Permian Basin while research and discussion of the optimal use of an Extra High Voltage (EHV) network in ERCOT system is underway in Project No. 55249, should this reliability plan consider a mixture of 345 kV and EHV options?

No. There is no reason to expect a mixed approach will result in an expedited buildout. If anything, a mixed approach could delay the buildout as compared to the 765-kV option. As was stated in the AEP Companies' comments about EHV transmission lines to the ERCOT Region in Project No. 55249, the 765-kV import path option provides higher capacity and lower impedance, allowing the 765-kV transmission line to:

- Deliver more power, reducing the number of new lines and new right-of-way needed to serve the load;
- Increase transfer capability over longer distances without the need for series compensation;
- Transfer more power efficiently with lower transmission losses; and
- Improve grid stability by increasing short circuit strength of the transmission grid, improving the ability for generators and the grid as a whole to withstand disturbances from faults.

The 765-kV import path option improves the reliability and efficiency of the transmission network with higher, more efficient transfers from generation sources to load centers over longer distances, allowing the underlying transmission system to off load so it can be operated at a more efficient and safe load level to better serve the local load centers.

3. What would be the impact to implementation of the plan if the Commission approves the plan for all the common local transmission projects to permit the utilities to expeditiously file CCN applications but delayed the approval of the import paths until after ERCOT completed its EHV Study in 2024? Please address in detail both the benefits and risks of this potential process.

The impact of such a process would likely slow down the implementation of the plan as compared to if the Commission approved the entire plan at once. In addition, there is no need to delay approval of the import paths. As stated in response to Question No. 1, there are benefits in approving the full plan, including 765-kV import paths, at this time to enable parties to begin development activities and to provide notice to equipment providers such that they can begin preparations to meet future demand. While completion of the 2024 RTP will provide additional insights regarding the integration of the Permian Plan within the larger ERCOT region, it is unlikely that it would significantly alter the recommendation for the Permian Basin region. Furthermore, the 765 kV option is less dependent on location specific assumptions which lowers the risk of future stranded assets being constructed as compared to the 345 kV option.

There are additional sensitivities around generation expansion and additional seasons / dispatch scenarios as well as more detailed voltage stability analysis that should be evaluated and those analyses may result in the need for plan adjustments. That being said, the 765-kV import path option is the most robust of the options considered and will provide the greatest flexibility to accommodate these additional considerations.

AFFORDABILITY AND COST

4. With the understanding that the cost of these projects will be passed along to all the ratepayers in ERCOT, what considerations should the Commission address to minimize rate impacts? Are there any guardrails the Commission should implement?

Assuming no significant departure from the existing process to the cost recovery and rate design associated with transmission investments, a key guardrail the Commission should consider to minimize the rate impact to all ratepayers in ERCOT is to select the approach that is both efficient and holistic in its scope and implementation. The 765-kV Reliability Plan for the Permian Basin is both efficient and holistic, and could be easily integrated into the statewide RTP recommendation that will be published later this year. The 765-kV system is the most efficient delivery design being considered, which provides the most benefits to customers, including the lowest rate impact, all else equal.

In addition, the Commission should consider the option that will allow the loads to connect to the ERCOT grid the soonest, because the increase in connected load will lead to costs being spread across more billing determinants, which will be important to keeping transmission rates lower for all customers.

5. Are there specific costs not captured in ERCOT's study, such as reactive compensation devices, auto transformers for EHV if the Commission chooses EHV, and series compensation equipment? If so, what are those costs?

No, the AEP Companies are not aware of any specific costs not captured in the ERCOT study for 500-kV and above. However, the AEP Companies note that the 345-kV import path option is more likely to require additional support in order to implement in an effective manner. Due to the length of the 345-kV import paths (i.e., multiple 150+ mile segments), detailed voltage stability analysis may reveal that additional reactive support will be needed to increase the loadability. This reactive support will likely result in additional expense associated with capacitors, static var compensators ("SVCs"), or synchronous condensers. In other words, the costs presented for the 345-kV option are likely understated.

In contrast, a major advantage of EHV transmission, particularly at 765-kV, is that series compensation equipment and other reactive compensation devices are typically not needed. Shunt reactors can be used to manage (lower) system voltages when transmission lines are lightly loaded.

Additionally, it should be noted that the 765-kV substation cost estimates used for this study, based upon the Midcontinent Independent System Operator ("MISO") 2024 Transmission Cost Estimation Guide, include shunt reactors for every line position. This is a conservative assumption because not every line position will necessarily require shunt reactors.

6. In approving this plan, how can the Commission ensure cost effectiveness for the listed projects? Please explain in detail and specifically address risks and offer potential mitigation solutions relating to:

a) *Load forecast*, because this will be the first time the Commission will rely on load forecast methodology based on PURA §37.056(c-1).

b) *Cost estimates*, because projects will not be vetted through ERCOT's Regional Planning Group, the stakeholder committee that regularly review proposed transmission projects.

With respect to subpart (a), AEP Texas has experienced record setting load growth over the past three years that ERCOT's traditional load forecasting approach failed to capture. Furthermore, AEP Texas' load projections provided for the Permian Basin study and the statewide 2024 RTP analysis were based on new customer additions that have signed letters of agreement ("LOAs") (along with financial commitment) or customers that have requested LOAs (and are only awaiting completion of studies to be able to execute the LOA). The load forecast projections do not include speculative loads that are currently looking at the AEP Texas service territory with the Company's economic development professionals.

With respect to subpart (b), these projects will still be subject to the CCN process (where estimated costs are included) as well as a subsequent prudence review where the project costs will be vetted through the Commission and stakeholder process. In other words, there are already other cost estimate controls included as part of the process.

CCN PROCESS

7. How should the Commission address any project in the plan in which more than one Transmission Service Provider can claim the legal right to build it?

The AEP Companies anticipate taking the same approach for EHV lines as the Companies currently do with joint 345-kV CCN applications, where the TSPs negotiate ownership in advance

of a joint CCN filing. In the recent past, the AEP Companies have negotiated joint ownership with multiple TSPs where, for example, the joint applicants would each own half of the transmission line from their respective stations to an agreed upon midpoint. This approach is consistent with PURA § 37.056(e), regarding assignment of projects based on ownership of existing electric utility facilities.

The AEP Companies note that adoption of the 765-kV import path option will likely present fewer questions over which TSPs can claim the legal right to build various portions of the project as compared to a 345-kV option because there are eight endpoints for the 765-kV import path and 21 endpoints for the 345-kV import path. Moreover, with so many more endpoints and line pathways traveling adjacent to existing stations, the 345-kV import path option may present more and potentially novel legal and factual questions over ownership that the AEP Companies have not had sufficient time to evaluate for purposes of this response. In any case, the more legal questions that arise will result in higher costs and an increase the time it will likely take to complete the project build out.

The AEP Companies note that there are locations in the project sites that are proposed for the Permian Basin that require new stations to be built in between existing stations on new transmission lines if the proposed project suite is approved. The same approach used in PURA § 37.056(e) should be used to assign ownership of those new station facilities.

8. Should the Commission consider any procedural changes to its traditional CCN process to account for the complexity and magnitude of the CCN cases?

No, the existing CCN procedural requirements are sufficient and adequately cover voltages over 345-kV. Under the existing rules, an applicant must assemble a robust link network to consider route alternatives and gain input from the public through outreach efforts and the Commission process. Limited general and technical siting criteria may be adjusted to account for the design specifications for 500-kV or 765-kV infrastructure, such as a wider right-of-way or turning angle limitations. However, this would be considered on a project-specific basis and adequately addressed under the current CCN process and siting documentation.

FINAL ORDER

9. What, if any, specific items should the Commission's final order include to provide clear and consistent directions for the implementation of the plan to the TSPs, ERCOT, and Staff?

In order to move forward with implementation of the Permian Basin Reliability Plan following Commission approval of that Plan, it is critical that the Commission's approval order identify or facilitate identification of the transmission service providers ("TSPs") responsible for the specific components of the Plan. As noted above, PURA § 37.056(e) provides the legal framework for assigning TSP responsibility for implementing the Plan, but the mechanism for employing the §37.056(e) framework for the Plan is currently unclear. ERCOT noted this issue in the cover letter to its July 25, 2024 Plan filing, stating that "Commission guidance will be needed regarding TSP responsibility for upgrades . . ."[3] Normally TSP assignment is addressed by ERCOT in the Regional Planning Group ("RPG") process, but that process will not be employed for the Permian Plan. ERCOT's Plan Study Report does not identify the TSPs responsible for carrying it out and some other mechanism or resolution will be essential to allow TSPs to move forward promptly with the Plan approved by the Commission. The Commission's approval order should address this issue.

At a minimum, the Commission's approval order should implement the PURA § 37.056(e) framework by assigning the approved Permian Plan projects to the owners of the facilities that directly interconnect with those projects, consistent with the direction in § 37.056(e). To the extent there are any uncertainties about application of the § 37.056(e) directives to specific projects, the order should direct the affected TSPs to confer and to promptly resolve such uncertainties.

[3] Project No. 55718, *Reliability Plan for the Permian Basin Under PURA § 39.167*, ERCOT Permian Basis Reliability Plan Study Report at 3 (cover letter) (July 25, 2024).

OPEN QUESTIONS

10. What unintended impacts or risks might arise out of approving or implementing ERCOT's proposed plan? How could they be avoided or mitigated? Are there any lessons from the Competitive Renewable Energy Zones implementation that the Commission should consider?

The AEP Companies recommend that the Commission use the process outlined in PURA § 37.056(e), as this will likely minimize disputes and decisions over ownership.

11. Are there any other aspects of ERCOT's proposed plan the Commission should consider?

ERCOT is experiencing tremendous load growth that is forecasted to expand with new loads from oil and gas, hydrogen, LNG, data centers, and cryptocurrency mining operations. The 2024 RTP is estimating to add approximately 60 GW of load on top of the Permian Basin load of approximately 24 GW for 2030. This 84 GW of projected load growth is basically the same size as the 85.5 GW peak that ERCOT experienced in the summer of 2023. With ERCOT projected to double its current load over the next six years, it is going to require ERCOT to make the next step in EHV to reliably serve this load and the additional generation that will be required in the future.

MISO is another region on the country that is experiencing high load growth, a high amount of power plant retirements, and a large integration of new generation additions creating constraints on the amount of power that can be transferred between its Eastern and Western Regions. In the spring of 2024, MISO revealed that its long-term transmission plan will center on building a 765-kV transmission highway maximizing land use, transfer levels, and be being cost effective as compared to other EHV options. SPP is also evaluating the implementation of 765-kV transmission to their long-term transmission plan.

II. Conclusion

The AEP Companies appreciate the opportunity to provide comments on Staff's questions and the Commission's consideration of these comments. An executive summary of the comments is provided at the end of this filing.

Respectfully submitted,

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ON BEHALF OF AEP TEXAS INC. AND ELECTRIC TRANSMISSION TEXAS, LLC

PROJECT NO. 55718

RELIABILITY PLAN FOR THE PERMIAN BASIN UNDER PURA §39.167	**§ § §**	**PUBLIC UTILITY COMMISSION OF TEXAS**

AEP Companies' Executive Summary

The AEP Companies appreciate the Commission's and ERCOT's work on the Permian Basin Reliability Plan. A summary of the AEP Companies' responses to Commission Staff's questions follows. The AEP Companies appreciate the Commission's consideration of these comments.

Question No. 1 - The Commission should approve the entire Permian Basin Reliability Plan without phasing in-service deadlines in 2030 and 2038 because the forecasted load between those periods is minimally different and the system upgrades identified are the same. A phased approach would also increase the costs and the time it will take to connect the loads and generation sources that are currently waiting to connect in the Permian Basin region.

Question No. 2 - There is no need to consider a mixed 345-kV and EHV option. Such an option could unnecessarily delay the buildout. In addition, the 765-kV import path option provides higher transfer capability for future load growth, requires fewer new lines to be constructed with less impact from new ROW, lower line losses (more efficient delivery), and less locational risk from future generation siting compared to the 345-kV import paths.

Question No. 3 – The impact of a delaying a decision on the import path option would likely delay the project. There is no need to delay approval of the import paths. A transmission expansion plan of this magnitude comes with an expectation and understanding that adjustments may be needed, but this should not prevent the Commission from providing the necessary direction to begin construction of the EHV system that can serve the needs of the ERCOT system for decades to come.

Question No. 4 - Assuming no significant departure from the existing process to the cost recovery and rate design associated with transmission investments, a key guardrail the Commission should consider to minimize the rate impact to all ratepayers in ERCOT is to select the approach that is both efficient and holistic in its scope and implementation.

Question No. 5 - One major advantage of EHV transmission, particularly at 765-kV, is that series compensation equipment and other reactive devices are typically not required to effectively move power over long distances, as is typically required at 345-kV.

Question No. 6 – The Commission's current CCN process and subsequent prudence reviews should be sufficient to help ensure the cost effectiveness of projects.

Question No. 7 – Where more than one TSP can claim the legal right to build a project, the AEP Companies anticipate negotiating ownership in advance of a joint CCN filing, which is its current process, in a manner consistent with PURA § 37.056(e).

Question No. 8 - The existing CCN procedural requirements are sufficient and adequately cover voltages over 345-kV.

Question No. 9 – The Commission's approval order should identify or facilitate identification of the TSPs responsible for the specific components of the plan. The Commission's approval order should implement the PURA § 37.056(e) framework by assigning the approved Permian Plan projects to the owners of the facilities that directly interconnect with those projects, consistent with the direction in § 37.056(e). To the extent there are any uncertainties about application of the § 37.056(e) directives to specific projects, the order should direct the affected TSPs to confer and to promptly resolve such uncertainties.

Question No. 10 – The AEP Companies recommend that the Commission use the process outlined in PURA § 37.056(e), as this will likely minimize disputes and decisions over ownership.

Question No. 11 – With the projected load growth in the ERCOT region over the next six years and the additional generation that is needed to connect to serve these loads, it is important that the Commission and ERCOT consider moving to 765-kV import paths.