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PROJECT NO. 55718

**RELIABILITY PLAN FOR THE
PERMIAN BASIN UNDER PURA
§ 39.167**

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**BEFORE THE
PUBLIC UTILITY COMMISSION
OF TEXAS**

**ONCOR ELECTRIC DELIVERY COMPANY LLC'S RESPONSE TO
COMMISSION STAFF'S QUESTIONS ON EHV DETERMINATION**

Oncor Electric Delivery Company LLC ("Oncor") files this response to the Staff Questions on PUCT's Determination of using EHV in ERCOT Region filed by the Staff ("Staff") of the Public Utility Commission of Texas ("Commission") on January 31, 2025 ("Staff's Questions"). This response is timely filed on or before February 14, 2025.

I. INTRODUCTION

Oncor appreciates the opportunity to provide these responses to Staff's Questions on the 345 kilovolt ("kV") and 765 kV plans compared in the Electric Reliability Council of Texas, Inc.'s ("ERCOT's") *2024 Regional Transmission Plan (RTP) 345-kV Plan and Texas 765-kV Strategic Transmission Expansion Plan Comparison* ("Plan Comparison").¹

Both ERCOT's and Oncor's analyses of 345 kV and 765 kV solutions demonstrate clear operational and load serving advantages with the adoption of the 765 kV voltage solution.

II. RESPONSES TO STAFF'S QUESTIONS

1. In ERCOT's 345 kV-765 kV comparison document, the total capital cost estimates for each voltage's 2024 Regional Transmission Plan are comparatively close.

- a. What other ongoing cost impacts should be given significant weight in this decision?***
- b. What economic and reliability benefits in the report should be given significant weight?***

Response:

Subpart a: What other ongoing cost impacts should be given significant weight in this decision?

At the planning stage of analysis, it is difficult to arrive at detailed costs estimates. That being said, ERCOT's cost estimates provide a quality frame of comparison for the two voltage options on new line construction.

¹ *Reliability Plan for the Permian Basin under PURA § 39.167, Project No. 55718, ERCOT's 2024 Regional Transmission Plan 345-kV Plan and Texas 765-kV Strategic Transmission Expansion Plan Comparison* (Jan. 24, 2025) (hereinafter, "ERCOT Plan Comparison").

However, cost estimates for rebuild projects are less reliable than cost estimates for greenfield projects due to uncertainties present at the estimate phase. Because the 345 kV plan involves more rebuilds, these uncertainties will have a greater impact on its cost. Oncor's recent experience in rebuilding several West Texas 345 kV corridors provides the basis for concluding that the rebuilding costs in ERCOT's estimates are likely too low. Rebuilding costs naturally involve far more variables to estimate than new line construction. These variables include whether outages can be obtained,² the timeliness of the outages that are obtained, whether work will need to be done on energized equipment and systems,³ what station upgrades will be required to accommodate the line upgrades, whether existing towers will be able to support upgraded conductors, whether sufficient right-of-way is available to permit the upgrade,⁴ and many others. All of these variables are unknown to ERCOT at the time of estimate. These uncertainties result in more cost variability for rebuild lines than new build lines. Given that the 345 kV plan involves approximately 1,400 more miles of rebuild,⁵ it is likely this uncertainty will have a greater cost impact on the 345 kV plan than the 765 kV plan.

The substantial number of rebuilds in the 345 kV plan will also likely lead to greater congestion during the construction process.⁶ The West Texas transmission network is heavily loaded today. This is a problem that will only grow as more load interconnects.⁷ The 345 kV plan's reliance on the rebuilding of existing lines will likely increase this congestion due to the loading of these lines.

Subpart b: What economic and reliability benefits in the report should be given significant weight?

The decision before the Commission will shape the ERCOT grid for the next 50 years. It is this timeframe upon which the Commission must focus. The question is which voltage solution will better serve Texas and the Permian Basin throughout the coming decades, not merely the first six years. As Senator Robert Nichols stated during a recent Business and Commerce hearing, "[i]t

² See ERCOT Plan Comparison at 8 (stating that granting outages will be "extremely difficult").

³ See *id.* at 8-9 (stating that hot reconductoring will result in increased costs).

⁴ See *id.* at iv (indicating that 345 kV line upgrades could have additional new right-of-way impact).

⁵ *Id.* at vii, 24.

⁶ See *id.* at iv.

⁷ See *id.* at ii (stating that unprecedented load growth is occurring and is projected to accelerate).

is our responsibility to not just build enough capacity for what we need now, but to look further into the future and not get trapped[...].”⁸

The voltage that will provide superior electrical performance long-term is clear.⁹ Each analysis in the ERCOT study demonstrates the superiority of the 765 kV solution.¹⁰ 765 kV provides significant flexibility over 345 kV given the uncertainty involved in the siting of load and generation. It reduces the number of rebuilds by over 1,400 miles and dramatically reduces line losses on the system.¹¹ Each of these benefits is only magnified when you evaluate these system characteristics across the 50 plus year life of transmission assets. Thus, the Commission should give significant weight to the relevant timeframe for this decision—which will stretch dramatically beyond the dates in the ERCOT study.

2. On September 18, 2024, ERCOT hosted a 765 kV Vendor Workshop which provided information on many aspects of design, construction, and equipment sourcing of 765 kV infrastructure.

- a. Regarding supply chain delays or disruptions, are there any impacts specific to either 765 kV or 345 kV, or are both impacted equally?***
- b. Are there any critical 765 kV considerations that were not addressed during that workshop?***

Response:

Subpart a: Regarding supply chain delays or disruptions, are there any impacts specific to either 765 kV or 345 kV, or are both impacted equally?

Oncor can build the 765 kV or 345 kV plan within the current timeline established. Oncor has already acted to reserve equipment and material necessary for the 345 kV or 765 kV plan. Oncor is ready to move forward with either option the Commission approves.

Supply chain delays and/or disruptions will equally impact Oncor’s ability to procure 765 kV and 345 kV equipment and materials. Both plans will require significant supply capacity with

⁸ Senator Robert Nichols, Before the S. Comm. on Bus. and Com., 89th Leg., R.S. (Feb. 4, 2025) (tape available from the Committee on Business and Commerce Video/Audio Archives), available at: <https://www.senate.texas.gov/videoplayer.php?vid=21057&lang=en> at 1:37:43.

⁹ Senator Nathan Johnson, Before the S. Comm. on Bus. and Com., 89th Leg., R.S. (Feb. 4, 2025) (tape available from the Committee on Business and Commerce Video/Audio Archives) (noting that Texas could have a newer, more flexible 765 kV technology or older 345 kV technology for about the same price), available at: <https://www.senate.texas.gov/videoplayer.php?vid=21057&lang=en> at 1:23:34.

¹⁰ See ERCOT Plan Comparison at 22-23 (concluding that 765 kV provides more steady-state transfer capability, dynamic stability, and system strength and is also more economically favorable).

¹¹ See *id.* at 19-20 (concluding that 765 kV lines “significantly reduce power losses,” with 540 GWh and 577 GWh saved in study years 2034 and 2039, respectively).

similar impacts and lead time requirements. While there are fewer manufacturing facilities that provide 765 kV engineered equipment, there is much greater demand for 345 kV equipment, making it essential to secure capacity early to support timelines, regardless of the voltage.

Subpart b: Are there any critical 765 kV considerations that were not addressed during that workshop?

Yes. The ability of the 765 kV solution to serve load beyond what was studied in the ERCOT analysis should be a point of focus. See Oncor's Response to Question No. 6. The difference in capacity provided by the 345 kV plan and 765 kV plan is stark. Given the lifespan of these assets, consideration should be given to the system's needs beyond the next six years and at load levels far above the ERCOT study parameters.¹²

- 3. Regarding the already-approved Permian Basin import paths, please compare the timing of construction buildout-to-energization for the 345 kV and 765 kV imports. Will one take significantly longer than the other? Please explain why.***

Response:

The Permian Basin plan generally expects similar timelines for constructing 765 kV and 345 kV import path options. However, Oncor believes it is likely that the 345 kV plan will take longer to construct and energize due to the delays and constraints involved in the rebuild-associated work. These sequencing and outage concerns associated with the 345 kV rebuilds should be taken into consideration.

The 765 kV option is simpler to implement, from a construction and regulatory basis. This is due to the reduced number of projects and facilities as compared to the 345 kV plan. The regulatory process for the 765 kV plan will take less total time due to the lower number of projects involved. For example, fewer projects means fewer certificate of convenience and necessity proceedings, which take up to 180 days per project.

- 4. Given that there are uncertainties in long-term load forecasts as well as load and generation types and siting, which plan would provide the most flexibility for the ERCOT region?***

Response:

From an operational and grid-planning perspective, the 765 kV plan is the superior solution. It will provide substantially more operational flexibility, require fewer facilities and

¹² See Sen. Nichols, *supra*, note 8.

right-of-way to serve the same amount of load,¹³ involve lower congestion costs,¹⁴ and better relieve constraints on the underlying high voltage system.¹⁵ As discussed in Oncor's response to Question No. 6 below, the 765 kV solution also provides the benefit of being able to serve more load with comparable dollars of infrastructure investment.

5. What are the pros and cons of deciding to utilize 765 kV infrastructure in the ERCOT region now versus waiting to implement it in the future?

Response:

The passage of HB 5066 presents the Commission and the State with a unique opportunity to be strategic and intentional in how they build for the Permian's future. Instead of looking at a single project needed to solve a single problem, the Commission is charged with adopting a strategic plan that meets the Permian's long-term needs. Today, Texas has the opportunity to adopt a plan that not only meets the current needs of the grid and its customers, but also meets their needs decades into the future by providing long term capacity. While 765 kV infrastructure does provide electrical benefits as a standalone solution, its most efficient application is as part of a backbone network of similar assets. Under the proposed comprehensive 765 kV plan, new 765 kV infrastructure can serve as a backbone alongside the existing 345 kV system to best realize long-term planning benefits. The Commission can place the grid in a forward-looking position by choosing to build the 765 kV plan. Conversely, if the Commission chooses the 345 kV plan and load growth continues to expand exponentially, it risks returning to this discussion in a few years without the level of flexibility currently available for the 765 kV plan.¹⁶

It is important to note that ERCOT studied these projects as a cohesive solution. If a return trip to ERCOT's Regional Planning Group will be required to review these projects, the ERCOT

¹³ See Testimony of Woody Rickerson, on behalf of ERCOT, Before the S. Comm. on Bus. and Com., 89th Leg., R.S. (Feb 4, 2025) (tape available from the Committee on Business and Commerce Video/Audio Archives) (noting that the 765 plan is more flexible because it requires less lines to serve the same amount of load), available at: <https://www.senate.texas.gov/video/player.php?vid=21057&lang=en> at 1:25:27; see also Senator Robert Nichols, Before the S. Comm. on Bus. and Com., 89th Leg., R.S. (Feb. 4, 2025) (tape available from the Committee on Business and Commerce Video/Audio Archives) (noting that there are already only so many viable corridors available for transmission lines and that 345 kV lines require more corridors than 765 kV lines), available at: <https://www.senate.texas.gov/video/player.php?vid=21057&lang=en> at 1:39:20.

¹⁴ See ERCOT Plan Comparison at 18-19 (concluding that the 765 kV plan would reduce congestion rent by \$94 million and \$172 million in study years 2034 and 2039, respectively, when compared with the 345 kV plan).

¹⁵ See *id.* at 16.

¹⁶ See Testimony of Woody Rickerson, on behalf of ERCOT, Before the S. Comm. on Bus. and Com., 89th Leg., R.S. (Feb 4, 2025) (tape available from the Committee on Business and Commerce Video/Audio Archives) (stating that the 345 kV plan poses a greater risk that as load growth continues the Commission will have to build more transmission infrastructure), available at: <https://www.senate.texas.gov/video/player.php?vid=21057&lang=en> at 1:24:48.

review should focus on the benefits of the solution as a whole, not its discrete parts. The most valuable benefits that flow to ERCOT from 765 kV infrastructure stem from the networking of 765 kV lines to create a state-wide backbone that transmits bulk power across Texas.

Adoption of a 765 kV solution now will also provide directional data to future generators and loads for siting decisions. While generation and load will not interconnect directly to the 765 kV system, generation and load will be able to consider the terminus of these 765 kV lines as part of their siting decisions.¹⁷

6. Are there any other benefits or drawbacks that have not been brought up and addressed which are critically important for the Commission to consider? Please describe in detail.

Response:

Yes. The load serving capability of the two voltage solutions is a critical consideration for the Commission. Given that the first decision before the Commission will be the Permian Basin import path voltage determination, the Permian provides a framework to examine this consideration.¹⁸ In the ERCOT Permian Basin Reliability Study (“Permian Study”), ERCOT designed and studied the Permian Basin projects’ ability to serve load at the levels defined in the study case.¹⁹ For the Permian Study, this was approximately 26.4 GW. In other words, ERCOT took a load level, considered it as a constant, and defined a system to reliably serve that load level. This is the established process and a quality method of study. One point of analysis that is not present in the Permian Study, however, is a determination of the maximum load that either solution can serve. Reframed from a simple load serving perspective: which voltage solution, the 345 kV or the 765 kV, can serve more load and/or require fewer incremental projects in the future to serve more load? This question is instructive in determining which solution provides the most available capacity for future development in the Permian. It also aligns with one of the direct mandates of HB 5066.²⁰

In the months since the release of the ERCOT Permian Study, Oncor retained EE PLUS Inc. (“EE PLUS”) and charged them with the task of determining whether the 345 kV solution or the 765 kV solution designed by ERCOT would add more capacity to the grid. EE PLUS took the

¹⁷ See ERCOT Plan Comparison at v (stating that the 765 kV plan would increase siting options for both generators and large loads).

¹⁸ See generally Reliability Plan for the Permian Basin under PURA §39.167, Project No. 55718.

¹⁹ Project No. 55718, ERCOT Permian Basin Reliability Plan Study Report (Jul. 25, 2024).

²⁰ Tex. H.B. 5066, 88th Leg., R.S. (2023), § 3, codified at PURA § 39.167(b) (requiring the Commission to direct ERCOT to develop a reliability plan that increases available capacity to meet forecasted load).

345 and 765 kV systems designed by ERCOT and stressed them by adding additional load beyond the levels considered in the Permian Study. Load was scaled up in tranches to determine the breaking point when thermal and voltage violations would occur under the ERCOT-defined contingency criteria. Basically, the goal was to determine how much load each system could reliably serve.

EE PLUS' analysis demonstrates that the Permian Basin projects can serve substantially more load with 765 kV import paths than with 345 kV import paths. Specifically, EE Plus' modeling efforts show that the Permian Basin solution with 765 kV import paths can serve approximately 4.4 GWs of additional load above the ERCOT studied levels. This is nearly double the additional load serving capability of the 345 kV solution, which was 2.3 GW. Functionally, this means that if the Commission selects to build the Permian Basin Import paths at 765 kV there will be over 2 GW of additional capacity available to the Permian Basin region. This is capacity that will be available to serve new future loads for essentially the same investment costs. If load continues to grow beyond this added capacity, significantly fewer projects are required under the 765 kV solution.

Oncor and EE Plus are conducting a study of the load serving benefits of the 2024 RTP Plan at 345 and 765 kV that is expected to show similar results and will provide those results when available.

III. CONCLUSION

Oncor appreciates this opportunity to respond to Staff's Questions and thanks those involved for their continued collaboration, time, and effort in this proceeding.

Respectfully submitted,

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**ATTORNEYS FOR ONCOR ELECTRIC
DELIVERY COMPANY LLC**

PROJECT NO. 55718

**RELIABILITY PLAN FOR THE
PERMIAN BASIN UNDER PURA
§ 39.167**

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**BEFORE THE
PUBLIC UTILITY COMMISSION
OF TEXAS**

**EXECUTIVE SUMMARY OF ONCOR ELECTRIC DELIVERY COMPANY LLC'S
RESPONSE TO COMMISSION STAFF'S QUESTIONS ON EHV DETERMINATION**

From an electrical grid operations and load service perspective 765 kV is the clear superior voltage for long distance power transfer in both the Permian Basin plan and the 2024 RTP Projects.

1. a) Cost estimates for rebuild projects are less certain. Rebuilds involve far more construction variability, which ERCOT can't anticipate, than new construction. Because the 345 kV plan involves more upgrades than the 765 kV plan, it is likely that rebuild-related uncertainties will have a more significant impact on the costs of the 345 kV option.

1. b) The appropriate timeframe for the commission's analysis should be a point of focus. The voltage selected will provide service to ERCOT for the next 50+ years. It is important to consider how the state will grow and its needs will change during this timeframe. In comparison to the 345 kV plan, the 765 kV plan provides significantly more flexibility, reduces congestion, and reduces the line losses on the system the benefit of each is only heightened year after year.

2. a) Oncor has proactively reserved equipment and material and is prepared to build the 765 kV or 345 kV plan within the currently-established timeframe. Supply chain delays and/or disruptions will equally impact Oncor's procurement for both voltage options.

2. b) Yes. The 765 kV solution's ability to serve additional load and thus accommodate future growth beyond ERCOT's studied load levels is instructive and helpful in this analysis.

3) While the Permian Basin plan generally expects similar construction timelines for both options, the 345 kV plan will take longer to construct due to uncertainties associated with rebuilds and outages. Because the 765 kV solution has less rebuild-associated work and fewer projects (e.g., fewer CCNs), it will be simpler to implement from a regulatory perspective.

4) The 765 kV plan will provide substantially more flexibility than the 345 kV option.

5) Implementing the 765 kV solution now maximizes the benefits offered by utilizing long-term planning to develop a cohesive 765 kV network designed to meet current needs and proactively addressing anticipated growth.

6) Oncor retained EE Plus to study how much additional load could be served by the Permian Projects with 765 kV import paths as opposed to 345 kV import paths. Results demonstrate that with 765 kV import paths the Permian projects have 4.4 GWs of load serving capacity above the ERCOT studied levels. This is nearly double the additional load that can be served by the Permian projects when 345 kV import paths are utilized.