Filing Receipt

Filing Date - 2025-02-06 10:47:43 AM

Control Number - 57519

Item Number - 8

PUC DOCKET NO. 57519

DIRECT TESTIMONY
OF JARED GURLEY, P.E., WITNESS FOR
ONCOR ELECTRIC DELIVERY COMPANY LLC

DIRECT TESTIMONY OF JARED GURLEY, P.E.

I. POSITION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is Jared Gurley. I am employed by Oncor Electric Delivery Company LLC ("Oncor"). I hold the position of Senior Manager in Oncor's Transmission Planning group. My business address is 777 Main Street, Suite 707, Fort Worth, Texas 76102.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL QUALIFICATIONS.

A. I am a licensed professional engineer in the State of Texas (License No. 115694) with over 15 years of experience in transmission planning, system protection, and transmission operations. I graduated with a Bachelor of Science degree in Electrical Engineering from Texas Tech University in 2009 and have worked for Oncor ever since.

My job duties include: (1) leading Oncor's evaluation of long-range transmission projects to resolve grid reliability issues; (2) performing power flow studies and analyses in accordance with North American Electric Reliability Corporation ("NERC") reliability criteria and the Electric Reliability Council of Texas ("ERCOT") Planning Guide; and (3) supporting the development of Oncor's transmission projects through the ERCOT and Public Utility Commission of Texas ("Commission") approval processes. One of the projects that I am responsible for evaluating, planning, and developing is Oncor's Ranger Camp Switch – Cattleman Switch 345 kilovolt ("kV") Transmission Line Project ("Proposed Transmission Line Project"). My educational and professional qualifications are more fully presented in my resume, which is attached hereto as Exhibit JG-1.

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS ("COMMISSION")?

A. Yes. I provided testimony in Docket Nos. 56799 and 57263.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my direct testimony is to address certain aspects of the Proposed Transmission Line Project, including:

- the electrical need for the project;
- Oncor's submission to ERCOT regarding the project;
- the adequacy of existing service and need for additional service;
- how the project supports the reliability and adequacy of the interconnected transmission system;
- how the project supports robust wholesale competition;
- the probable improvement of service or lowering of cost to consumers in the area if the certificate of convenience and necessity ("CCN") is granted;
- the effect of granting the requested CCN on Oncor and any other electric utility serving the proximate area; and
- the presentation and comparison of project alternatives.

These issues are addressed in Oncor's responses to Question Nos. 14-16 in the Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line Project submitted in this docket ("Application"). The facts and statements in Question Nos. 14-16 of the Application and Attachment Nos. 3-8 to the Application, which I sponsor, are true and correct to the best of my knowledge. Oncor will offer the Application, as it may be amended and/or supplemented, into evidence in this proceeding.

III. PROJECT BACKGROUND, DESCRIPTION, AND DEVELOPMENT

Q. PLEASE DESCRIBE THE EXISTING TRANSMISSION SYSTEM IN THE PROJECT AREA.

A. Mitchell County is located within the ERCOT West Texas weather zone and is part of the region known as the Permian Basin. Multiple transmission lines and stations are located in the project area, but they are aging and of lower capacity compared to newer facilities. Oncor's transmission facilities

in the project area need extensive upgrades and modifications to meet current planning and design standards. These transmission system improvements are also needed to meet surging customer demand resulting from continued expansion of the oil and gas industry. A map of the area and schematic of the transmission system in the area are included as Attachment Nos. 7 and 8 to the Application, respectively.

Q. PLEASE DESCRIBE THE PROPOSED TRANSMISSION LINE PROJECT.

A. The Proposed Transmission Line Project is a new, double-circuit 345 kV transmission line to be built on double-circuit capable steel monopoles between Oncor's Ranger Camp Switch and Cattleman Switch, both of which are currently under construction. The Proposed Transmission Line Project is wholly located in Mitchell County. The Proposed Transmission Line Project will be built on new structures within new right-of-way ("ROW"), all of which Oncor already acquired to build the 4.2 mile proposed route. The direct testimony of Oncor witness Ms. Samantha Angers further discusses Oncor's structure selection and ROW acquisition for the Proposed Transmission Line Project.

Q. PLEASE DESCRIBE ONCOR'S AND ERCOT'S REVIEW PROCESS FOR THE PROPOSED TRANSMISSION LINE PROJECT.

A. Oncor submitted the West Texas 345 kV Infrastructure Rebuild Project to the ERCOT Regional Planning Group ("RPG") on November 3, 2023 ("RPG Submittal"). The RPG Submittal is included as Exhibit JG-2 to my testimony and Attachment No. 4 to the Application. In the RPG Submittal, Oncor proposed many transmission system improvements, including the Proposed Transmission Line Project (collectively, the "West Texas Rebuild Project"). Oncor's RPG Submittal proposed the West Texas Rebuild Project as a Tier 1 project that is critical to the reliability of the ERCOT system.

ERCOT began its review process following receipt of the RPG Submittal and published its independent review report on May 16, 2024, which recommends the addition of each component of the RPG Submittal.

ERCOT's report is included as Exhibit JG-3 to my testimony and Attachment No. 5 to the Application. ERCOT's Board of Directors formally endorsed the West Texas Rebuild Project, including the Proposed Transmission Line Project, as a Tier 1 project. ERCOT's June 18, 2024, resolution and meeting minutes memorializing this approval are included as Exhibit JG-4 to my testimony and Attachment No. 6 to the Application.

Q. HAS THE COMMISSION APPROVED OTHER ASPECTS OF THE WEST TEXAS REBUILD PROJECT?

A. Yes. On August 9, 2024, the Commission approved the Ranger Camp Switch 345 kV Transmission Tap Line project in Commission Docket No. 56597. The Proposed Transmission Line Project is the next infrastructure project requiring a CCN amendment that needs to be built to allow Oncor to timely execute the overall West Texas Rebuild Project.

IV. NEED FOR THE PROPOSED TRANSMISSION LINE PROJECT

Q. WHY IS THE PROPOSED TRANSMISSION LINE PROJECT NEEDED?

A. The Proposed Transmission Line Project is needed to expand and upgrade Oncor's transmission system to address reliability issues in West Texas. Load growth, load integration requests, and the age of existing facilities contribute to the Proposed Transmission Line Project's need. The Proposed Transmission Line Project will result in a more stable, reliable, and interconnected transmission system.

Q. PLEASE ELABORATE ON THE IDENTIFIED RELIABILITY ISSUES.

A. The rapid growth of the historical and forecasted loads cause concern for transmission reliability in the area of the project. The following table shows project area historical load from 2020 to 2024 and projected load growth from 2025 to 2029:

YEAR	2020	2021	2022	2023	2024
LOAD (MW)	4,834	5,119	5,699	6,476	8,480
YEAR	2025	2026	2027	2028	2029
LOAD (MW)	10,139	11,119	11,595	11,993	12,226

Oncor's steady-state contingency analysis shows thermal overloads by summer 2028 under certain NERC post-contingency conditions. Oncor's analysis was based on ERCOT's October 10, 2022, Steady State Working Group (SSWG) case. Oncor identified thermal overloads on numerous 345 kV transmission lines and 345/138 kV autotransformers in the West Texas portion of Oncor's transmission grid when simulating the unavailability of either: (i) one 345 kV transmission line; or (ii) one generating unit or 345/138 kV autotransformer and one 345 kV transmission line. Table 1 on page 12 of the RPG Submittal and in Oncor's response to Question No. 14 of the Application further details these thermal overloads under Oncor's steady-state contingency analysis.

Q. HOW WILL THE PROPOSED TRANSMISSION LINE PROJECT IMPROVE RELIABILITY IN THE STUDY AREA?

A. The Proposed Transmission Line Project will address the identified reliability concerns by adding a new double-circuit 345 kV line between Oncor's Ranger Camp Switch and Cattleman Switch. This will create a new 345 kV pathway and improve bi-directional power flow to the area. The Proposed Transmission Line Project will be the second transmission line built as part of the West Texas Rebuild Project. The Proposed Transmission Line Project is urgently needed to address the reliability issues in the area.

Q. HOW DOES THE PROPOSED TRANSMISSION LINE PROJECT ADDRESS CONTINUED LOAD GROWTH IN THE PROJECT AREA?

A. The Proposed Transmission Line Project will enhance the ability to connect new loads to the transmission system and provide more reliable service to existing and new loads. The rapidly rising demand for power in the project

area has further exacerbated the need to promptly address the identified reliability issues. Construction of the Proposed Transmission Line Project will address continued load growth by providing more reliable, networked service in the project area and by reducing the strain on existing transmission lines.

Q. DOES THE PROPOSED TRANSMISSION LINE PROJECT FACILITATE ROBUST WHOLESALE COMPETITION?

A. Yes. The Proposed Transmission Line Project will facilitate robust wholesale competition by facilitating the delivery of economical electric power at 345 kV from existing and future generation resources located inside and outside of the project's study area to existing and future electric customers in the area.

Q. DOES THE PROPOSED TRANSMISSION LINE PROJECT FOSTER COMPETITION IN THE RETAIL MARKET?

A. Yes. The Proposed Transmission Line Project will improve transmission service through an area where retail competition is available.

Q. PLEASE SUMMARIZE THE BENEFITS THAT THE PROPOSED TRANSMISSION LINE PROJECT WILL PROVIDE TO THE GRID IN WEST TEXAS.

A. Benefits that the Proposed Transmission Line Project will provide as part of the West Texas Rebuild Project include: (1) resolving reliability issues, including thermal overloads; (2) increasing system load serving capacity; (3) improving system operational flexibility; (4) creating an additional 345 kV source in the project area; and (5) upgrading and retiring aging infrastructure that is not suitable to serve rapidly increasing demand for reliable electric service in the project area.

Q. WILL THE PROPOSED TRANSMISSION LINE PROJECT AFFECT ANY OTHER ELECTRIC UTILITIES IN THE AREA?

A. No. Oncor will construct, own, and operate the Proposed Transmission Line Project, including its two endpoints. These two endpoints are Oncor's

Ranger Camp Switch and Cattleman Switch. No other electric utility's existing transmission facilities will be utilized for the Proposed Transmission Line Project. No other electric utilities will be served by or connected to the Proposed Transmission Line Project.

V. ALTERNATIVES CONSIDERED

Q. PLEASE DESCRIBE ONCOR'S ASSESSMENT OF ALTERNATIVES TO THE PROPOSED TRANSMISSION LINE PROJECT.

A. Alternatives to the Proposed Transmission Line Project are limited due to the existing system configuration and remote location of the surrounding transmission lines in the area. There are no feasible alternatives to many of the transmission system improvements (e.g., station reconfigurations) comprising the West Texas Rebuild Project.

Q. DID ONCOR CONSIDER A TRANSMISSION ALTERNATIVE TO THE PROPOSED TRANSMISSION LINE PROJECT?

A. Yes. Oncor analyzed adding 345 kV circuits, on new structures within new ROW, adjacent to the existing 345 kV transmission lines leaving Oncor's Morgan Creek Switch.

Q. WHAT DID ONCOR'S ANALYSIS CONCLUDE?

A. Oncor's analysis determined that while this alternative provides certain advantages, it would not provide the same level of transmission system benefits as, and was inferior to, the West Texas Rebuild Project. Information regarding advantages to this alternative, including the avoidance of "hot work" and the creation of an alternative transmission path into the area, is included in the RPG Submittal.

However, Oncor determined that this alternative was not viable when considering cost and time. This alternative includes building more 345 kV transmission lines adjacent to existing 345 kV transmission lines, which would require the purchase of additional new ROW. Furthermore, a separate CCN would be required for each new 345 kV transmission line, which would affect project time and cost. Oncor determined that this

alternative was inferior considering its likelihood to cost more and take longer to complete while failing to benefit the grid to the same extent as the West Texas Rebuild Project.

Q. WOULD A DISTRIBUTION ALTERNATIVE TO THE PROPOSED TRANSMISSION LINE PROJECT BE FEASIBLE?

A. No. Distribution alternatives to the Proposed Transmission Line Project would not resolve the identified reliability issues on the transmission system or address the large loads and generation seeking interconnection at transmission-level voltage.

Q. WOULD VOLTAGE UPGRADES, CONDUCTOR BUNDLING, OR ADDITIONAL TRANSFORMERS PRESENT VIABLE ALTERNATIVES TO THE PROPOSED TRANSMISSION LINE PROJECT?

A. No. Upgrading voltage, bundling of conductors of existing facilities, and adding transformers would not address the identified reliability issues. These alternatives would also fail to provide the necessary level of service to meet electric demand in the area, including the increasing oil and gas loads.

VI. CONCLUSION

Q. ARE THE PROPOSED FACILITIES NECESSARY FOR THE SERVICE, ACCOMMODATION, CONVENIENCE, OR SAFETY OF THE PUBLIC WITHIN THE MEANING OF TEXAS UTILITIES CODE § 37.056(a), TAKING INTO ACCOUNT THE FACTORS SET OUT IN TEXAS UTILITIES CODE § 37.056(c)?

A. Yes. Existing transmission service in the project area is inadequate. The additional service that the Proposed Transmission Line Project will provide is needed to support the reliability and adequacy of the interconnected transmission system.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. The Proposed Transmission Line Project is needed to address reliability issues, including thermal overloads. The Proposed Transmission Line

Project will strengthen reliability, improve service, and support current and future load by creating a more networked transmission grid with additional capacity in an area where demand is growing at a rapid pace.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

AFFIDAVIT

STATE OF TEXAS §
§
COUNTY OF TARRANT §

BEFORE ME, the undersigned authority, on this day personally appeared Jared Gurley who, having been placed under oath by me, did depose as follows:

"My name is Jared Gurley. I am of legal age and a resident of the State of Texas. The foregoing testimony and exhibits offered by me are true and correct, and the opinions stated therein are, to the best of my knowledge and belief, accurate, true, and correct."

Jared Gurley

SUBSCRIBED AND SWORN TO BEFORE ME on this 13th day of January, 2025.

Rhonda Stremmel
Notary Public, State of Texas

RHONDA STREMMEL
NOTARY PUBLIC
STATE OF TEXAS
ID: 125021108
EXP: 08-13-2028

422 Gray Wolf Trail
Hudson Oaks, TX 76087
Phone (817) 694-7915
E-mail Jared.Gurley@Oncor.com

Jared Gurley

Education

Texas Tech University — **Lubbock, TX**
Graduated in May 2009
Bachelor of Science in Electrical Engineering

Work Experience

June 2009 – Present Oncor Electric Delivery — **Fort Worth, TX**

Sr. Manager Transmission Planning

June 2023 – Present

- Manage a team of transmission planning engineers that cover west Texas
- Guide planning team to solve transmission system reliability deficiencies and develop Regional Planning Group submittals
- Manage west Texas planning input for Integrated Scoping team
- Collaborate with the Compliance team to meet NERC and ERCOT requirements.
- Aided in developing Operational Solution process to serve customers sooner
- Engaged in ERCOT PLWG and RPG stakeholder groups
- Assisted in coordinating transmission providers and ERCOT in early stages of Permian Basin Reliability Study
- Facilitate a high-performance team culture including hiring high-potential job candidates, providing mentoring to professionally develop team members, and demonstrating continuous improvement practices.
- Perform performance reviews, salary administration, and other management administrative tasks

Manager Transmission II – Relay Settings

June 2019 – June 2023

- Assist in managing the Relay Setting group and manage relay setting contractors
- Manage project assignments for all relay setting engineers
- Assist in maintaining compliance with ERCOT and NERC standards
- Led a team to develop and implement a new relay setting process with new software to assist relay setting engineers by automating tasks and reducing human error
- Assisted in the development of Relay Setting Application Guide and other job aids
- Experience in providing technical support to other groups and organizations

P&C Manager, Fort Worth Transmission

November 2015 – June 2019

- Directed the Protection and Control organization
- Coordinated the analysis, review and communications of critical events
- Actively participated in task force assignments, planning sessions
- Ensured that District NERC/ERCOT required Maintenance is performed correct and on time

Senior Engineer, System Protection – Relay Settings

June 2009 – November 2015

Professional License

Professional Engineer – State of Texas

Leadership Programs

APEX 2017 Graduate

WEST TEXAS 345 KV INFRASTRUCTURE REBUILD PROJECT

ERCOT RPG Submittal
November 3, 2023

Table of Contents

Executive Summary

The need to expand and rebuild Oncor's transmission facilities in West Texas is being driven by load growth, load integration requests, and the need to rebuild aging facilities. The aging facilities in this area need extensive upgrades and modifications to meet surging customer load and current planning and design standards. This project addresses the need to expand and further reinforce the transmission system in West Texas.

The need for this project is derived from the recommendations in ERCOT's Permian Basin Load Interconnection Study – Final Update presentation, presented by ERCOT at the October 15, 2021 Regional Planning Group (RPG) meeting. The Permian Basin Load Interconnection (PBLI) Study was performed by ERCOT with input from affected Transmission Service Providers (TSPs) and other RPG stakeholders. The final PBLI study report was published by ERCOT on December 8, 2021. The study identified transmission reliability needs resulting from continued expansion of the oil and natural gas industry in the Permian Basin area. In the PBLI Study, ERCOT identified a set of 'Preferred' and a set of 'Placeholder' transmission upgrade projects, with the understanding that ERCOT could use the PBLI Study as part of ERCOT's Independent Review of a 'Preferred' RPG Project. This RPG Project presents and provides the justification for many of the ERCOT designated 'Preferred' transmission upgrades in the PBLI Study in this single submittal. This Proposed RPG Project includes components of ERCOT's 'Preferred' Project IDs 1, 2, 3, and 25, with each of the applicable Project ID components being modeled in the analysis. Some of the components of the ERCOT 'Preferred' Projects list have already been submitted and approved by ERCOT and the RPG, (see the Introduction section of this Proposed RPG Project).

An integral part of this Proposed RPG Project is the reconfiguration of the Morgan Creek Switch and the rebuild of the 345 kV Lines from Morgan Creek – Tonkawa, Morgan Creek – Midland County Northwest, and Morgan Creek – Odessa EHV. The Morgan Creek Switch property is currently shared between Oncor and Vistra. Due to the size of the proposed Morgan Creek Switch rebuild, the land constraints necessary to rebuild the switch, and the routing constraints with the existing property, Morgan Creek Switch will need to be broken up into two separate switch stations (Ranger Camp and Cattleman 345/138 kV Switches) to accommodate the 345 kV, 138 kV, and 69 kV facilities and a third station (Morgan Creek 138 kV Switch) to be rebuilt to interconnect the existing Morgan Creek generation. The 345 kV lines from Morgan Creek to Tonkawa, Morgan Creek to Midland County Northwest, and Morgan Creek to Odessa EHV will each need to be rebuilt with newer structures and higher ampacity conductor.

Oncor is proposing a Tier 1 project that will consist of the following elements:

- Establish the new Ranger Camp 345/138/69 kV Switch, approximately 1.0 mile north of the existing Morgan Creek 345/138 kV Switch, including two 600 MVA, 345/138 kV autotransformers, and one 177 MVA, 138/69 kV autotransformer. The Ranger Camp 345/138/69 kV Switch will initially be installed with (1) a 14-breaker, 345 kV, breaker-and-a-half bus arrangement, (2) a 16-breaker, 138 kV, breaker-and-a-half bus arrangement, and 3) a 2-breaker, 69 kV, single bus arrangement. All terminal and associated equipment will meet or exceed 5000 A for 345 kV, 3200 A for 138 kV and 2000 A for 69 kV;
    - Connect the existing 69 kV lines into the new Ranger Camp Switch:
        - Morgan Creek – Colorado City 69 kV Line (normal and emergency rating of 81 MVA)
        - Morgan Creek – Big Spring 69 kV Line (normal and emergency rating of 62 MVA)

  - Connect the existing 138 kV lines into the new Ranger Camp Switch:
    - Morgan Creek – Eskota 138 kV Line (normal and emergency rating of 186 MVA)
    - Morgan Creek – Barber Lake West 138 kV Line (normal and emergency rating of 186 MVA)
    - Morgan Creek – Barber Lake East 138 kV Line (normal and emergency rating of 186 MVA)
    - Morgan Creek – Sun 138 kV Line (normal and emergency rating of 186 MVA)
    - Morgan Creek – Cosden 138 kV Line (normal and emergency rating of 287 MVA)
  - Reroute the existing Morgan Creek – Falcon Seaboard 345 kV Line (normal and emergency rating of 956 MVA) approximately 1.4 miles, on new right-of-way (ROW), to loop into the new Ranger Camp Switch;
  - Reroute the existing Morgan Creek – Tonkawa 345 kV Line (normal and emergency rating of 1072 MVA) approximately 1.7 miles, with approximately 0.76 miles of existing ROW and approximately 0.94 miles of new ROW, to loop into the new Ranger Camp Switch;
  - Relocate the existing 177 MVA, 138/69 kV autotransformer from Morgan Creek Switch to the new Ranger Camp Switch;
- Establish the new Cattleman 345/138 kV Switch, approximately 2.0 miles southwest of the existing Morgan Creek 345/138 kV Switch, including two 600 MVA, 345/138 kV autotransformers. The Cattleman 345/138 kV Switch will initially be installed with (1) a 15-breaker, 345 kV, breaker-and-a-half bus arrangement, and (2) a 9-breaker, 138 kV, breaker-and-a-half bus arrangement. All terminal and associated equipment will meet or exceed 5000 A for 345 kV, and 3200 A for 138 kV;
  - Connect the existing McDonald Road – Morgan Creek 138 kV Line (normal and emergency rating of 329 MVA) into the new Cattleman Switch, using new ROW;
  - Reroute the existing Morgan Creek – Champion Creek/LCRA Bitter Creek 345 kV Double-Circuit (DCKT) Line (normal and emergency rating of 1072 MVA) approximately 2.5 miles, with approximately 1.25 miles of existing ROW and approximately 1.25 miles of new ROW, to loop into the new Cattleman Switch;
  - Reroute the existing Morgan Creek – LCRA Gasconades 345 kV Line (normal and emergency rating of 1434 MVA) approximately 2.5 miles, with approximately 0.37 miles of existing ROW and approximately 2.13 miles of new ROW, to loop into the new Cattleman Switch;
  - Connect the existing Morgan Creek – Consavvy 345 kV Line (normal and emergency rating of 1072 MVA) and the existing Morgan Creek – Longshore 345 kV Line (normal and emergency rating of 1072 MVA) into the new Cattleman Switch, using existing ROW;
- Establish the new approximately 4.2 mile Cattleman – Ranger Camp 345 kV DCKT Line (normal and emergency rating of 2987 MVA) using double-circuit capable structures with two circuits in place, using new ROW;
- Rebuild the Morgan Creek 138 kV Switch, in the existing Morgan Creek 345/138 kV Switchyard. The Morgan Creek 138 kV Switch will be rebuilt from the existing 12-breaker, 138 kV double-bus arrangement to a 10-breaker, 138 kV, breaker-and-a-half bus arrangement. All terminal and associated equipment will meet or exceed 3200 A for 138 kV. This portion of the Proposed RPG Project includes the following elements:
  - Establish two approximately 0.1 mile Morgan Creek – Morgan Creek CT Yard 138 kV Lines (normal and emergency rating of 614 MVA) using separate single-circuit capable structures with one circuit in place, using existing ROW;

  - Establish a new approximately 1.2 miles Morgan Creek - Ranger Camp 138 kV DCKT Line (normal and emergency rating of 614 MVA) using double-circuit capable structures with two circuits in place, using existing ROW;
  - Establish a new approximately 3.3 miles Morgan Creek - Cattleman 138 kV DCKT Line (normal and emergency rating of 614 MVA) using double-circuit capable structures with two circuits in place, using approximately 0.82 miles of existing ROW and approximately 2.48 miles of new ROW;
- Establish the new Prong Moss 345 kV Switch, approximately 29.4 miles southwest of the existing Morgan Creek 345/138 kV Switch along the existing 345 kV Morgan Creek – Midland East 345 kV Line corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station. The Prong Moss 345 kV Switch will initially be installed with a 12-breaker, 345 kV, breaker-and-a-half bus arrangement. All terminal and associated equipment will meet or exceed 5000 A;
  - Construct an approximately 0.1 mile loop of the existing Morgan Creek – Falcon Seaboard 345 kV Line (normal and emergency rating of 956 MVA) into the new Prong Moss 345 kV Switch, approximately 7.0 miles south of Falcon Seaboard, using new ROW;
  - Construct an approximately 0.1 mile loop of the existing Falcon Seaboard – Midland East 345 kV Line (normal and emergency rating of 956 MVA) into the new Prong Moss 345 kV Switch, approximately 7.0 miles south of Falcon Seaboard, using new ROW;
  - The existing 345 kV double-circuit line from Falcon Seaboard Switch to the newly proposed location of Prong Moss 345 kV Switch will tie into the new Prong Moss 345 kV Switch but will not be rebuilt as part of this Proposed RPG Project;
- Modify the existing Tonkawa 345 kV Switch by adding one new 5000 A breaker-and-a-half rung with two new 5000 A, 345 kV circuit breakers on the new rung;
- Rebuild the existing 21.3 mile Morgan Creek – Tonkawa 345 kV Line (previously Morgan Creek – Tonkawa, now Ranger Camp – Tonkawa) by:
  - Rebuilding the existing 21.3 mile 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA), on double-circuit capable structures with one circuit in place, using existing ROW;
  - Installing one new 21.3 mile 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) on the vacant side of the structures;
- Rebuild the existing 70.6 mile Morgan Creek – Midland East 345 kV Line (previously Morgan Creek – Falcon Seaboard – Midland East, now Ranger Camp – Prong Moss – Midland East) by:
  - Rebuilding the existing approximately 29.4 mile Ranger Camp – Prong Moss 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) using double-circuit capable structures with one circuit in place, using existing ROW;
  - Installing one new 29.4 mile Ranger Camp – Prong Moss 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) on the vacant side of the new structures;
  - Rebuilding the existing approximately 41.2 mile Prong Moss – Midland East 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) using double-circuit capable structures with one circuit in place, using existing ROW;

  - Installing one new 41.2 mile Prong Moss – Midland East 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) on the vacant side of the new structures;
- Rebuild the existing 17.3 mile Midland East – Midland County Northwest 345 kV Line by:
  - Rebuilding the existing approximately 17.3 mile Midland East – Midland County Northwest 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) using double-circuit capable structures with one circuit in place, with approximately 16.3 miles of existing ROW and 1.0 mile of new ROW;
  - Installing one new 17.3 mile Midland East – Midland County Northwest 345 kV circuit with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) on the vacant side of the new structures;
- Rebuild the existing Midland County Northwest 345 kV Switch buswork and terminal equipment to meet or exceed 5000 A;
  - Modify the existing Midland County Northwest 345 kV Switch by adding one new 5000 A breaker-and-a-half rung with two new 5000 A, 345 kV circuit breakers on the new rung;
- Rebuild the existing 88.7 miles Morgan Creek – Odessa EHV 345 kV DCKT Line (previously Morgan Creek – Odessa EHV, now Cattleman – Odessa EHV) by:
  - Rebuilding the existing 88.7 mile Morgan Creek – Odessa EHV 345 kV DCKT Line with a conductor rated 5000 A or greater (normal and emergency rating of 2987 MVA) using double-circuit capable structures with two circuits in place, using existing ROW;
  - Convert the existing Longshore 345 kV Switch from a 6-breaker ring-bus configuration into an 11-breaker, 345 kV, breaker-and-a-half bus arrangement. All terminal and associated equipment will meet or exceed 5000 A for 345 kV;
    - Construct an approximately 0.1 mile loop of the existing Morgan Creek – Longshore Flyby – Consavvy 345 kV Line into the rebuilt Longshore 345 kV Switch;
  - Upgrade all terminal equipment at the existing 2-breaker Midessa South 345 kV Switch to meet or exceed 5000 A;
  - Upgrade all terminal equipment at the existing Quail East 345 kV Switch, 3-breaker ring bus to meet or exceed 5000 A;
  - Upgrade terminal equipment on two 345 kV breaker-and-a-half rungs of the existing Odessa EHV Switch to meet or exceed 5000 A;
  - Upgrade two 345 kV single breaker terminals and main bus at the existing Odessa EHV Switch to meet or exceed 5000 A;
- Establish the new Reiter 345/138 kV Switch, including two 600 MVA, 345/138 kV autotransformers, approximately 3.0 miles south of the existing Odessa EHV 345/138 kV Switch, along the Odessa EHV – Moss/Wolf 345 kV DCKT Line corridor. The Reiter 345/138 kV Switch will initially be installed with (1) a 12-breaker, 345 kV, breaker-and-a-half bus arrangement and (2) a 10-breaker, 138 kV, breaker-and-a-half bus arrangement. All terminal and associated equipment will meet or exceed 5000 A for 345 kV, and 3200 A for 138 kV;
  - Construct an approximately 0.2 mile loop of the existing Odessa EHV - Moss 138 kV Line (normal and emergency rating of 614 MVA) into the new Reiter 138 kV Switch, using new ROW;

  - Construct an approximately 0.1 mile loop of the existing Odessa EHV - Wolf 138 kV Line (normal and emergency rating of 614 MVA) into the new Reiter 138 kV Switch, using new ROW;
  - Construct an approximately 0.1 mile loop of the existing Odessa EHV – Moss & Odessa EHV – Wolf 345 kV DCKT Line (normal and emergency rating of 2987 MVA) into the new Reiter 345 kV Switch, using new ROW;
- Modify the existing Tesoro 345 kV Switch by adding two new 5000 A breaker-and-a-half rungs with two new 5000 A, 345 kV circuit breakers on each rung;
- Construct a new approximately 4.0 mile Reiter – Tesoro 345 kV DCKT Line (normal and emergency rating of 2987 MVA) using double-circuit capable structures with two circuits in place, using new ROW;

Table 3 below lists the components of this Proposed RPG Project that will likely require a CCN filing.

This Proposed RPG Project will (1) address ERCOT's identified reliability projects, (2) resolve identified thermal overloads in the ERCOT Permian Basin Load Integration study, (3) improve system operational flexibility, (4) increase system load serving capacity, (5) create an additional 345 kV source for West Texas and (6) upgrade and retire aging infrastructure.

This Tier 1 RPG project in Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector counties is estimated to cost $1.12 billion. The estimated cost of this RPG reflects the fact that the vast majority of the work necessary to complete the various project components associated with this submittal will need to be performed on energized transmission elements ("hot" work) and/or will require construction of temporary by-pass transmission facilities. This type of work on this project is essential for a variety of reasons.

First, obtaining clearances on the existing 345 kV lines would be impractical and risk system reliability. The analysis contained herein demonstrates that thermal violations on various 345 kV lines would occur under certain existing single-circuit 345 kV contingencies, and therefore taking clearances on the existing 345 kV lines would create unfavorable system conditions. Second, load growth in West Texas has been driven primarily by the oil and gas industry. As a result, it is becoming less scalable, because load remains relatively persistent even during off-peak periods when construction is usually performed. Third, obtaining clearances in West Texas is becoming more challenging. Clearance moratoriums are getting longer and more restricted. At times, depending on system conditions and additional work in the area, ERCOT has been required to cancel construction clearances required to perform work on a given project. Clearance cancellations present the worst of both worlds from a project timing and cost perspective, because it necessitates costly hot work but also results in cascading project schedule disruptions based on the shift or disappearance of the clearance previously relied upon in the project work sequencing. Because Oncor does not have control over clearance schedules and clearance timing, it cannot rely on obtaining the necessary clearances while still maintaining a realistic expectation to meet the summer 2028 in-service date for these projects. Thus, performing the work necessary to complete this RPG in a timely and efficient manner requires the flow of 345 kV transmission into West Texas to be uninterrupted and necessitates 'hot' work and/or temporary by-pass transmission facilities for large portions of these projects.

This project is recommended for construction to meet a summer 2028 in-service date. The projected in-service date may change based on requirements for environmental assessment, licensing requests, regulatory approval, rights-of-way acquisition and construction progress. Oncor will work with ERCOT as necessary to develop and implement Constraint Management Plans based on summer 2028 operational conditions. In addition to RPG approval, multiple Certificates of Convenience and Necessity (CCNs) will be required for portions of this Proposed RPG Project, as listed in Table 3 below.

Introduction

Oncor continues to see load growth in west Texas due to the high level of activity in the oil and gas industry. Demand is expected to continue to grow at a rapid pace, mainly driven by new loads and electrification activities, including conversion of gas-powered equipment to electrical operation or moving load from on-site generation to the grid to improve reliability. This growth forecast is supported in the ERCOT Permian Basin Load Interconnection (PBLI) Study report which states that electric load in west Texas is expected to nearly double by 2030.

In order to meet the forecasted Permian Basin load, several projects will be required. Other RPG submittals Oncor has recently submitted or plans to submit for review in the near future are:

- Midland East Area Project (accepted by RPG 3/12/21);
- Consavyy 345/138 kV Switch Project (accepted by RPG 4/4/2022);
- Lenorah/Volta 345/138 kV Switch Project (accepted by RPG 4/4/2022);
- Tesoro (fka known as Quail East) 345/138 kV Switch Project (accepted by RPG 11/7/22);
- Rockhound 345/138 kV Switch Project;
- Prong Moss 345/138 kV Switch Project
- Prairieland 345/138 kV Switch and Prairieland – Quartz Sand 138 kV Line Project; and
- Multiple projects identified in the ERCOT Delaware Basin Load Interconnection Study.

The extent of the necessary transmission system changes and upgrades requires Oncor to submit major projects well in advance of the need, as it is anticipated that the completion of the Proposed RPG Project may take 4-5 years. Oncor's Proposed RPG Project provides a roadmap to improve and reinforce the 345 kV transmission grid in West and Far West Texas. Morgan Creek Switch is an aging facility, and in order to accommodate the aforementioned projects and the increasing area demand more generally, a rebuild of Morgan Creek Switch will be essential for maintaining operational flexibility and reliability in the area. Because of land and routing constraints, the Morgan Creek Switch portion of the Proposed RPG Project will result in two new 345/138 kV switches, Ranger Camp Switch and Cattleman Switch, and one rebuilt 138 kV switch, Morgan Creek Switch. Additionally, the ERCOT Permian Basin Load Interconnection Study recommended the existing single-circuit 345 kV Line from Tonkawa – Morgan Creek – Midland County Northwest, be rebuilt as a double-circuit 345 kV Line.

Figure 1 identifies the approximate location of the Proposed RPG Project, while Figure 2 provides a simplified one-line diagram illustrating the existing configuration of Morgan Creek Switch and adjacent facilities prior to the Proposed RPG Project.

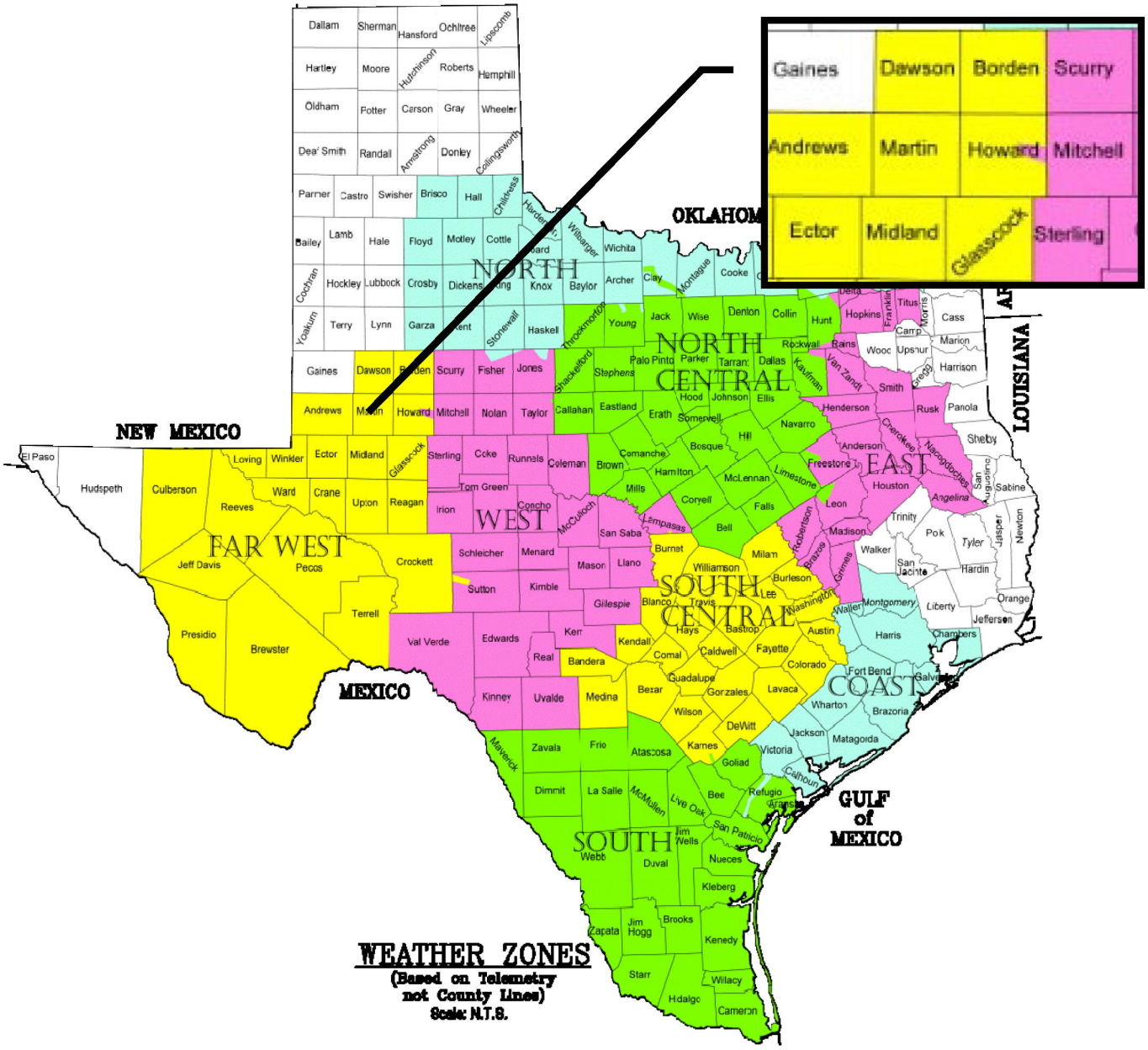

Figure 1. Proposed Project Approximate Location

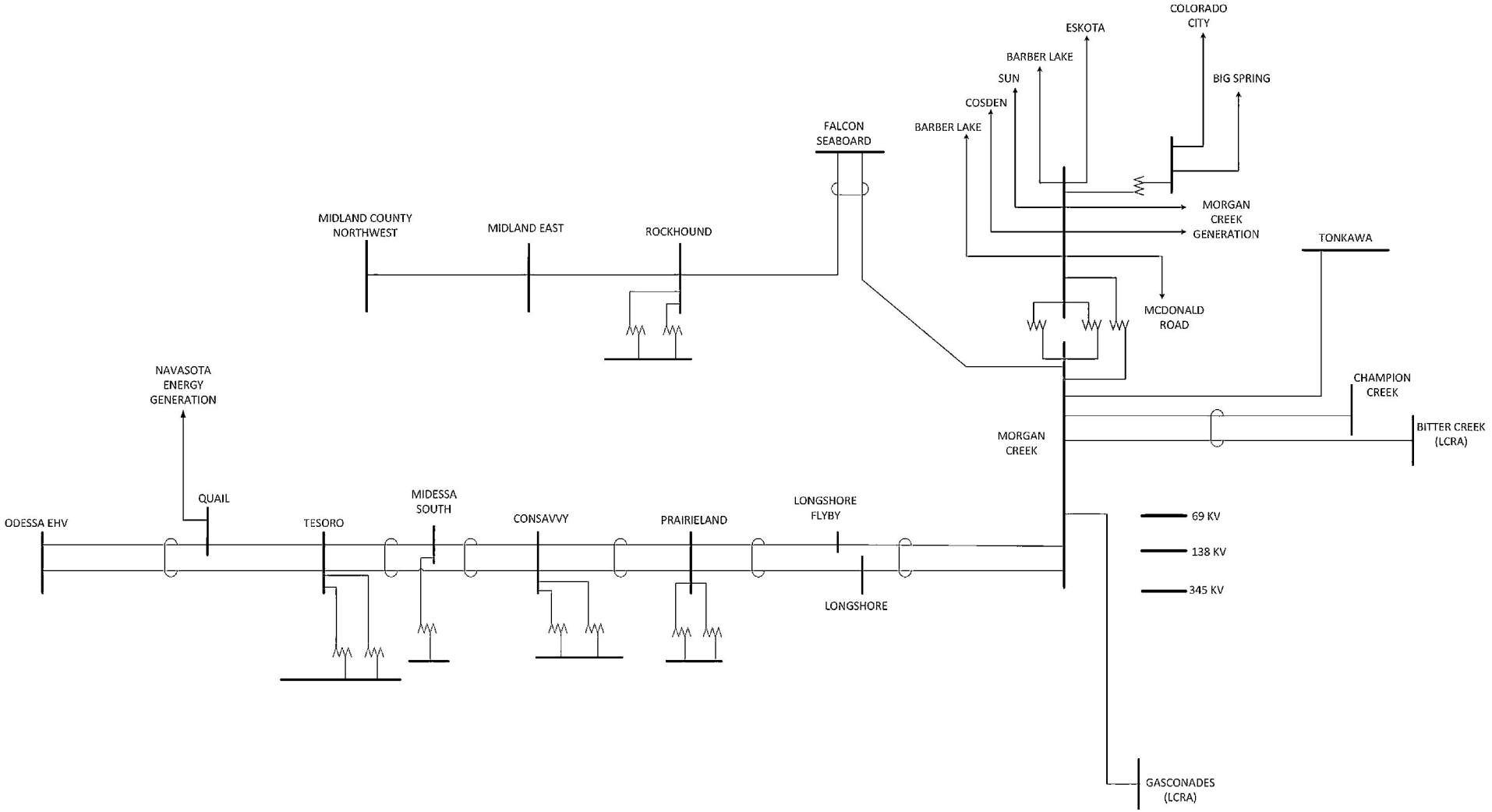

Figure 2. West Texas 345 kV Infrastructure Rebuild Pre-Project Configuration

Purpose and Necessity

The ERCOT Permian Basin Load Interconnection Study and Oncor's analysis identified several transmission upgrades that will be necessary to connect oil and gas loads in the Permian Basin area. The Proposed RPG Project will be necessary to accommodate the upgrades identified in Oncor's analysis and in the ERCOT Permian Basin Load Integration Study. This project, along with the others listed in the Introduction, will be vital to maintaining reliability and operational flexibility within the region for the foreseeable future.

Steady-State Analysis

Oncor performed a comparative steady-state analysis under Summer 2028 conditions which revealed thermal overloads on various 345 kV lines in the West Texas portion of Oncor's transmission grid. These overloads were identified under various contingency conditions, including some N-1 contingency scenarios. The case used for this study was the ERCOT Steady State Working Group (SSWG) case published October 10, 2022 (22SSWG_2028_SUM1_U1_Final_10102022). Relevant off-cycle IDVs published on the ERCOT Market Information System (MIS) as of May 18, 2023 were applied to the base case. Additionally, the base case was modified to include approximately 800 MW of newly signed Oncor loads in West Texas and Far West Texas through May 18, 2023. To determine the Proposed RPG Project's potential adverse impacts to system voltages and thermal loading limits, contingency analysis for this project was performed in accordance with NERC Reliability Standard TPL-001-5.1 and ERCOT Planning Guide Reliability Performance Criteria 4.1.1.1 (1) (d). The results justifying the need for the proposed project, in addition to the results listed in the ERCOT Permian Basin Load Interconnection Study, are summarized in Table 1. The subsequent results after the completion of the Proposed RPG Project are summarized in Table 2.

Pre-Project Thermal Loading				
NERC Category	Contingency		Monitored Element	2028 Summer % Loading Without Proposed Projects
	Initial Event (PSSE Buses)	Second Event (PSSE Buses)		
P1	Prairieland - Morgan Creek 345 kV Line (18548 - 19000 id 1, 19000 - 1030 id 1)	N/A	Longshore - Prairieland 345 kV Line	107.5
	Consavvy - Prairieland 345 kV Line 1 (11387 - 18548 id 1)	N/A	Consavvy - Prairieland 345 kV Line 2	99.4
	Consavvy - Prairieland 345 kV Line 2 (11387 - 18548 id 2)	N/A	Consavvy - Prairieland 345 kV Line 1	99.4
P7	Morgan Creek - Champion Creek/LCRA Bitter Creek 345 kV Double-circuit Line (1030 - 1414 id 1, 1030 - 71050 id 1)	N/A	Morgan Creek - Tonkawa 345 kV Line	129.1
	Prairieland - Longshore/Morgan Creek 345 kV Double-circuit Line (18548 -1058 id 1, 18548 - 19000 id 1, 19000 - 1030 id 1)	N/A	Falcon Seaboard - Rockhound 345 kV Line	105.8
P3	Either Odessa Ector CC Train (130321 id C1, 130322 id C2, 130323 id C0)	Prairieland - Morgan Creek 345 kV Line (18548 - 19000 id 1, 19000 - 1030 id 1)	Morgan Creek - Longshore 345 kV Line	95.1
		Consavvy - Prairieland 345 kV Line 1 (11387 - 18548 id 1)	Consavvy - Prairieland 345 kV Line 2	114.7
		Consavvy - Prairieland 345 kV Line 2 (11387 - 18548 id 2)	Consavvy - Prairieland 345 kV Line 1	114.7
		Prairieland - Longshore 345 kV Line (18548 -1058 id 1)	Prairieland - Morgan Creek 345 kV Line	102.9
EP3	Either Odessa Ector CC Train (130321 id C1, 130322 id C2, 130323 id C0)	Morgan Creek - Champion Creek/LCRA Bitter Creek 345 kV Double-circuit Line (1030 - 1414 id 1, 1030 - 71050 id 1)	Morgan Creek - Tonkawa 345 kV Line	143.3
		Prairieland - Longshore/Morgan Creek 345 kV Double-circuit Line (18548 -1058 id 1, 18548 - 19000 id 1, 19000 - 1030 id 1)	Falcon Seaboard - Rockhound 345 kV Line	116.4
	Falcon Seaboard CC Train (130001 id C1, 130002 id C2, 130003 id C0)	Prairieland - Longshore/Morgan Creek 345 kV Double-circuit Line (18548 -1058 id 1, 18548 - 19000 id 1, 19000 - 1030 id 1)	Falcon Seaboard - Morgan Creek 345 kV Line	108.8
EP6	Consavvy 345/138 kV Autotransformer 1 (11386, 11387, 11388 id 1)	Consavvy - Midessa South/Tesoro 345 kV Double-circuit Line (11387 - 18540 id 1, 11387 - 1125 id 1)	Consavvy 345/138 kV Autotransformer 2	100.5
	Consavvy 345/138 kV Autotransformer 2 (11386, 11387, 11389 id 2)	Consavvy - Midessa South/Tesoro 345 kV Double-circuit Line (11387 - 18540 id 1, 11387 - 1125 id 1)	Consavvy 345/138 kV Autotransformer 1	100.5
	Einstein 345/138 kV Autotransformer (23852, 23874, 23875 id 1)	Bearkat - North McCamey 345 kV Double-circuit Line (59903 - 76000 id 1, 59903 - 76000 id 2)	Longshore - Prairieland 345 kV Line	120.8

Table 1 – Worst Post-Contingency Line Loading (Pre-Project)

Post-Project Thermal Loading	
Monitored Element	**2028 Summer Worst % Loading After Proposed Projects (All Contingencies)**
Ranger Camp - Cattleman 345 kV Line 1	18.8
Ranger Camp - Cattleman 345 kV Line 2	18.8
Falcon Seaboard - Prong Moss 345 kV Line 1	24.6
Falcon Seaboard - Prong Moss 345 kV Line 2	24.6
Midland East - Rockhound 345 kV Line 1	25.1
Midland East - Rockhound 345 kV Line 2	25.1
Ranger Camp - Prong Moss 345 kV Line 1	29.9
Ranger Camp - Prong Moss 345 kV Line 2	29.9
Cattleman - Longshore 345 kV Line 1	32.5
Cattleman - Longshore 345 kV Line 2	32.5
Consavvy - Prairieland 345 kV Line 1	36.1
Consavvy - Prairieland 345 kV Line 2	36.1
Ranger Camp - Tonkawa 345 kV Line 1	37.0
Ranger Camp - Tonkawa 345 kV Line 2	37.0
Prong Moss - Rockhound 345 kV Line 1	38.2
Prong Moss - Rockhound 345 kV Line 2	38.2
Longshore - Prairieland 345 kV Line 1	42.9
Longshore - Prairieland 345 kV Line 2	42.9
Consavvy 345/138 kV Autotransformer 1	84.4
Consavvy 345/138 kV Autotransformer 2	84.4

Table 2 – Worst Post-Contingency Line Loading (Post-Project)

Dynamic Analysis

Oncor performed a dynamic stability analysis to evaluate the impact of the addition of this project on the transmission system. The analysis was conducted using two of the Dynamic Working Group (DWG) cases published in May 2022 (DWG SUM2029 and DWG HWLL2026). The HWLL 2026 case was adjusted to match the long-term topology to create an off- peak 2028 case, designated as HWLL2028. System topology updates necessary to implement the Proposed RPG Project were used in both study cases. Contingencies included in NERC Categories P1, P3, P4, P6, and P7 were studied. NERC Categories P2 and P5 were omitted as NERC category P4 contingencies are more impactful than P2, and P5 contingencies generally would not be applicable given Oncor's redundant system protection philosophy within the study area. The results of the dynamic stability assessment indicate that the proposed project will not have an adverse effect on transmission system dynamic stability in the project vicinity. Oncor will continue to perform annual dynamic analysis for this area.

Subsynchronous Resonance (SSR) Screening

The Proposed Project was screened in 2029 Summer Peak conditions (DWG 2029 Summer Peak case published May 2022). The study was performed with and without the Proposed Project in-service, and the project did not result in a reduction in the number of outages required to create a radial path between a generator and a series compensated line. Since the project will not increase the likelihood of a radial condition occurring with respect to pre-project system conditions, no further SSR analysis is warranted.

Short-Circuit Study

Oncor evaluated the short-circuit impacts of the Proposed Project using the System Protection Working Group (SPWG) case "22_SPWG_2027_FY_06302022_FINAL". The SPWG case was modified to include changes associated with the proposed project, as well as other Oncor system changes that occurred since the development of the SPWG case. The analysis revealed that the Proposed RPG Project did cause various 138 kV breakers, in the vicinity of the project, to become overdutied. The cost of the overdutied breakers is not included in the cost of this Proposed RPG Project. All identified overdutied breakers will be replaced with upgraded breakers over the next 4 – 5 years, prior to or in connection with energization of the Proposed RPG Project, with other breakers identified during Oncor's annual Overdutied Breaker Analysis. Oncor will continue to perform annual short-circuit studies.

Project Description

In order to address the identified reliability concerns, Oncor recommends the project components listed in the Executive Summary section.

Figure 3 provides a simplified one-line diagram illustrating the configuration of Morgan Creek Switch and adjacent facilities after the Proposed RPG Project.

One-Line Diagram

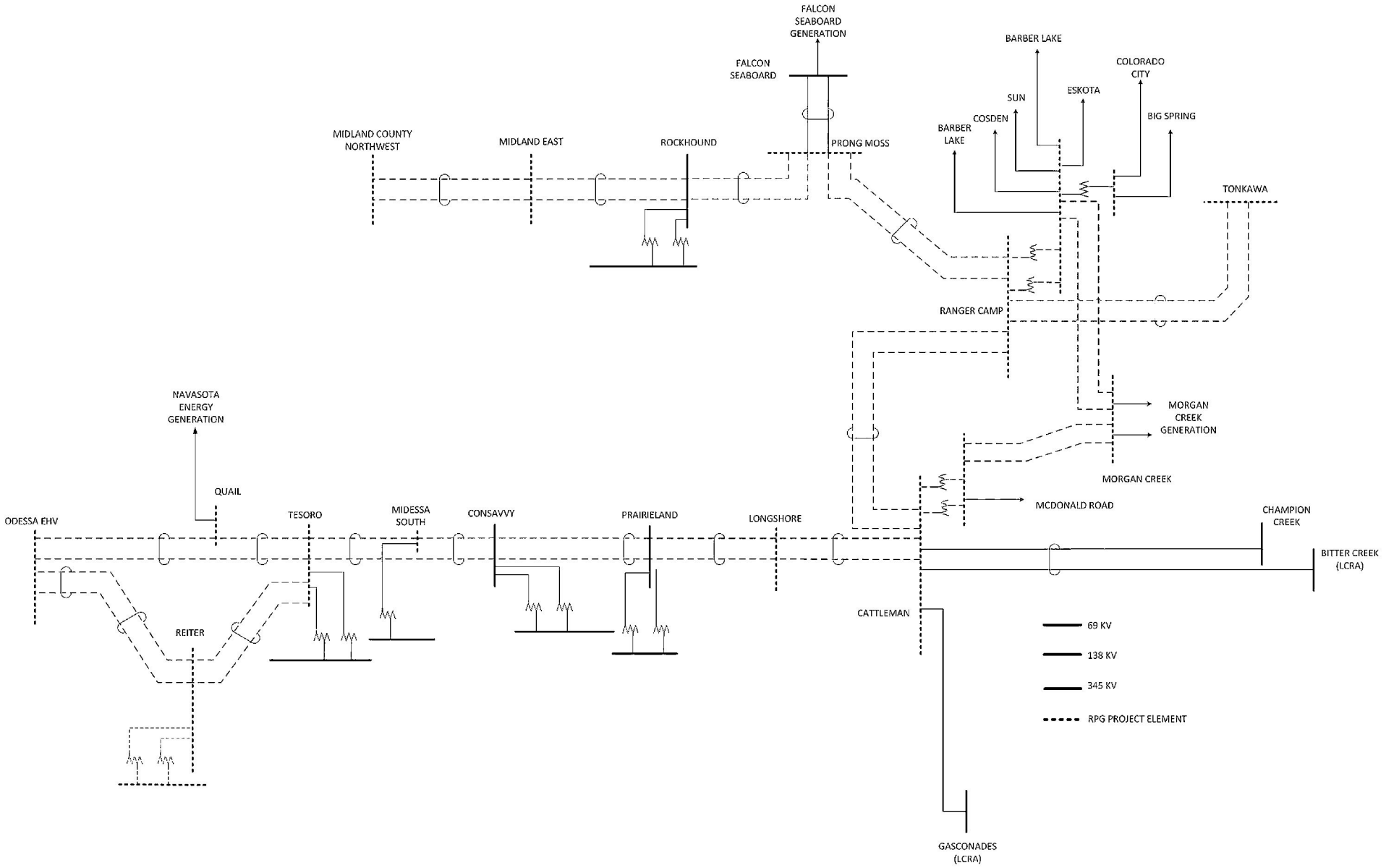

Figure 3. West Texas 345 kV Infrastructure Rebuild Post-Project Configuration

Alternative Solutions Considered

Given the age and state of the existing Morgan Creek Switch and 345 kV lines in West Texas, this project was deemed necessary to accommodate the substantial increases in area demand in general, and the specific upgrades identified in the ERCOT Permian Basin Load Interconnection Study in particular. As mentioned in the Executive Summary and in the Introduction of this submittal, the ERCOT Permian Basin Load Integration Study recommended all of the proposed upgrades included in this Proposed RPG Project.

As a result of the interconnectedness of the existing system, there are no alternatives to many of the upgrade and station reconfigurations discussed above. However, due to the inability of taking multiple, extended clearance outages to rebuild the existing 345 kV lines and stations Oncor did analyze the possibility of constructing additional 345 kV circuits, on new structures within new ROW, next to the existing 345 kV transmission lines leaving Morgan Creek Switch. This alternative does provide certain advantages, avoidance of "hot work", creation of an alternative transmission path into the area, and other operational, resiliency, and flexibility benefits to the system. However, building additional 345 kV transmission lines, adjacent and parallel to, the existing 345 kV transmission lines would require the purchase of additional new ROWs and would also require a CCN for each new 345 kV transmission line, resulting in additional time to complete and the likelihood of higher costs. Nevertheless, this alternative did not produce results similar to the Proposed RPG Project and Oncor did not deem this a viable alternative from a cost or timeliness perspective. No other additional alternatives were considered to the necessary upgrades listed in the ERCOT Permian Basin Load Interconnection Study, and confirmed in Oncor's analysis detailed in this Proposed RPG Project.

Project Cost

Component	Project Cost (Millions)	New ROW Required	CCN
Ranger Camp 345/138 kV Switch *	$94.76	Yes	No
Cattleman 345/138 kV Switch *	$106.48	Yes	No
Morgan Creek 138 kV Switch **	$27.10	Yes	Yes
Tonkawa – Morgan Creek 345 kV DCKT Line	$37.16	No	Yes
Morgan Creek – Odessa EHV 345 kV DCKT Line	$362.70	Yes	No
Morgan Creek – Midland East 345 kV DCKT Line	$307.34	No	Yes
Midland East – Midland County NW 345 kV DCKT Line	$90.02	Yes	Yes
Reiter 345/138 kV Switch	$70.04	No	No
Reiter – Tesoro 345 kV DCKT Line	$20.74	Yes	Yes
TOTALS	**$1,116.34**		

* - Switch cost includes line reroutes and reconnections
** - This cost includes a new 138 kV line from Morgan Creek Switch – Cattleman Switch

Table 3. Proposed RPG Solution Project Cost Summary

Recommendation

In order to accommodate the system upgrades outlined in the Permian Basin Load Interconnection Study, modernize aging infrastructure, and maintain operational flexibility and reliability, Oncor recommends that the West Texas 345 kV Infrastructure Rebuild Project be carried out to include the project components listed in the Executive Summary section.

In addition to the aging infrastructure, this project is necessary to accommodate the upgrades identified in the ERCOT Permian Basin Load Interconnection Study. The projected in-service date may change based on requirements for environmental assessment, licensing requests, regulatory approval, rights-of-way acquisition and construction progress. Completing the West Texas 345 kV Infrastructure Rebuild Project will meet reliability requirements, relieve thermal overloading, maintain acceptable system voltages, and provide adequate transmission capacity for the system under pre- and post-contingency conditions. The estimated cost for this Tier 1 Proposed RPG Project is $1.12 billion, based on the expectation that some elements of this project will be constructed using energized (hot) work processes. This project is recommended to meet a summer 2028 in-service date.

ERCOT Independent Review of the Oncor West Texas 345-kV Infrastructure Rebuild Project

Document Revisions

Date	Version	Description	Author(s)
May 16, 2024	1.0	Final	Ben Richardson
		Reviewed by	Robert Golen, Prabhu Gnanam

Executive Summary

Oncor submitted the West Texas 345-kV Infrastructure Rebuild Project to the Regional Planning Group (RPG) on November 3, 2023. Oncor proposed this project to address load growth, load integration requests, the need to rebuild aging facilities and NERC TPL-001-5 reliability criteria violations. The expected in-service date (ISD) of this project is Summer 2028. This project is located in the West and Far West Weather Zones in Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties.

ERCOT completed the Permian Basin Load Interconnection Study (PBLI)[1] in December 2021 to identify transmission upgrades, especially long lead time transmission upgrades, necessary to reliably serve the existing and projected oil and gas loads in the Permian Basin area. The Permian Basin area includes the Delaware Basin, Midland Basin, and Central Basin Platforms which covers most of the counties in the Far West Weather Zone plus five adjacent counties in the West Weather Zone. The geographic and reliability assessment scope of the West Texas 345-kV Infrastructure Rebuild Project are a subset of the Permian Basin Load Interconnection Study. The Permian Basin Load Interconnection Study stated that if the preferred upgrades identified in that study are submitted to Regional Planning Group (RPG) for review, ERCOT may use that study report as part of ERCOT Independent Review. The West Texas 345-kV Infrastructure Rebuild Project includes components of 'Preferred' Project IDs 1, 2, 3 and 25 identified by the Permian Basin Load Interconnection Study. More details of the Permian Basin Load Interconnection Study can be found in Appendix A.

Additionally, ERCOT completed an updated study which confirmed the need for this project and that the Oncor West Texas 345-kV Infrastructure Rebuild Project addresses the need.

Accordingly, based on this independent review, ERCOT recommends the following project as submitted by Oncor:

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA.
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV:
    - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
    - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
  - Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
    - Morgan Creek to Eskota
    - Morgan Creek to Barber Lake West
    - Morgan Creek to Barber Lake East
    - Morgan Creek to Sun
    - Morgan Creek to Cosden

[1] https://www.ercot.com/gridinfo/planning

  - Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
    - Morgan Creek to Colorado City
    - Morgan Creek to Big Spring
  - Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch
- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers
- Construct a new Cattleman 345/138-kV Switch, approximately 2.0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA
- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:
  - Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
  - Morgan Creek to LCRA Gasconades adding approximately 2.13 miles of new ROW
  - Morgan Creek to Consavvy
  - Morgan Creek to Longshore
- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA
- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers

- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA
- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers
- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW
- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment at 3-breaker, ring bus, Quail East 345-kV Switch to at least 2988 MVA
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW

- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers

The recommended project is a Tier 1 project estimated to cost $1.12 Billion. The estimated cost reflects the fact that the vast majority of the work necessary to complete the various project components will need to be performed on energized transmission elements and/or will require construction of temporary by-pass transmission facilities. The project is recommended for construction to meet a summer 2028 ISD. However, Oncor has advised that the projected in-service date may change based on requirements for various approvals, ROW acquisition and construction progress.

Multiple Certificate of Convenience and Necessity (CCN) filings will be required for this transmission project. Oncor will work with ERCOT as early as practical to develop outage plans needed for construction and implement Constraint Management Plans (CMP) based on summer 2028 operational conditions.

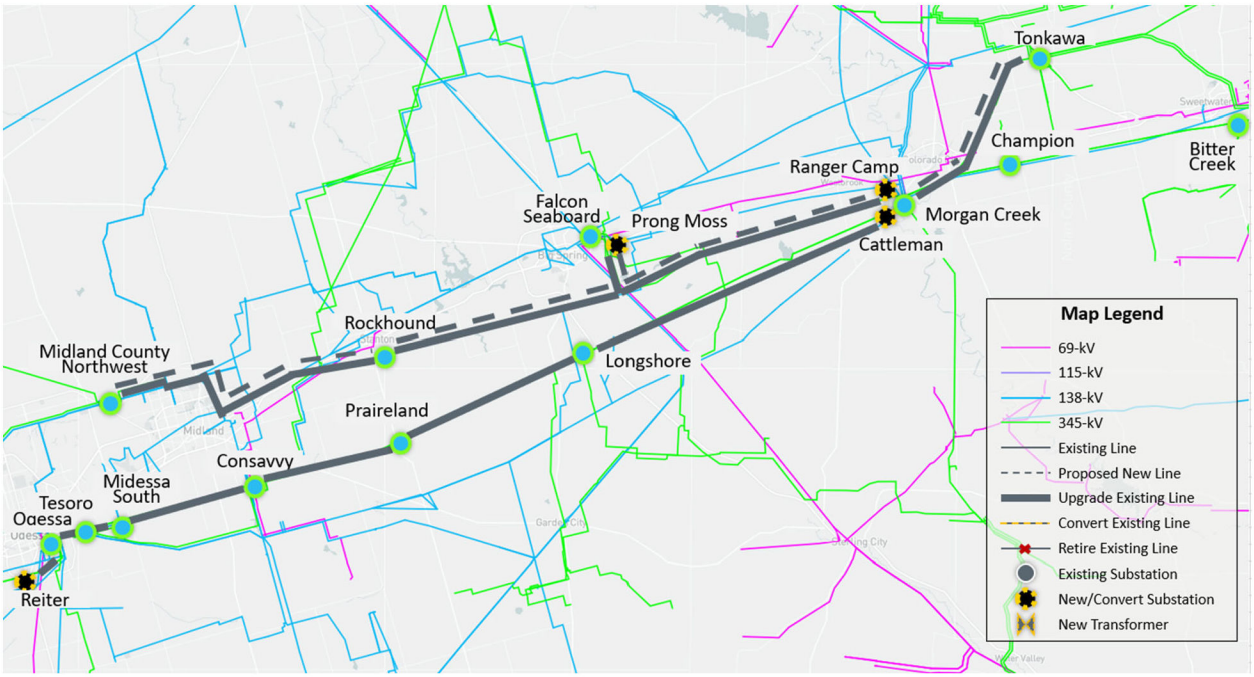

Figure E.1: Map of Recommended Upgrades

Table of Contents

1 Introduction

As part of the continuing efforts to address challenges in the Permian Basin, ERCOT completed the Permian Basin Load Interconnection Study (PBLI)[2] in December 2021 through extensive review and input by TSPs and stakeholders.

The PBLI identified the reliability challenges and a set of transmission upgrades, especially long lead time transmission upgrades, to connect and reliably serve the existing and projected oil and gas loads in the Permian Basin area utilizing the demand forecast from the IHS Markit study[3]. The IHS Markit study is a customer demand study performed by IHS Markit, which provides an in-depth analysis of the oil and gas industry and provides an electricity demand forecast in the Permian area through 2030. According to the IHS Markit study report, the demand forecast was based on geology and resource assessment, industry intelligence, oil and gas expertise, commercial considerations, translations of historical and forecasted oil and gas activities into electric load demands in every single square mile in the Permian Basin area.

As shown in Appendix A, the Permian Basin Load Interconnection Study identified both preferred and placeholder transmission upgrades and stated that "If the preferred upgrades identified in [PBLI] are submitted to Regional Planning Group (RPG) for review, ERCOT may use [PBLI] as part of the ERCOT Independent Review". Some components of PBLI "Preferred upgrades" have already been submitted and approved by ERCOT and the RPG. The Oncor West Texas 345-kV Infrastructure Rebuild Project presents and re-confirms justification for PBLI 'Preferred' Projects IDs 1, 2, 3 and 25.

Oncor submitted the West Texas 345-kV Infrastructure Rebuild Project for RPG review to address load growth, load integration requests and the need to rebuild aging facilities. This submittal is provided in Appendix B.

This RPG project has an estimated cost of $1.12 Billion and is classified as a Tier 1 project pursuant to Protocol Section 3.11.4.3. The estimated cost reflects the fact that the vast majority of the work necessary to complete the various project components associated with this project will need to be performed on energized transmission elements and/or will require construction of temporary by-pass transmission facilities. The project is recommended for construction to meet a summer 2028 in-service date (ISD). However, Oncor has advised that the projected ISD may change based on requirements for various approvals, right-of-way (ROW) acquisition and construction progress.

Multiple Certificate of Convenience and Necessity (CCN) filings will be required for this transmission project. Oncor has committed to work with ERCOT as necessary to develop and implement Constraint Management Plans based on summer 2028 operational conditions.

Since the primary components of the West Texas 345-kV Infrastructure project have already been analyzed and identified as preferred upgrades in the Permian Basin Load Interconnection Study, ERCOT conducted the independent review of this RPG project by updating study results and assumptions to check if any recent system changes would potentially alter or modify the projects recommended in these studies. The following sections describe the details of the updated study assumptions, methodology, and the results of the ERCOT Independent Review.

[2] https://www.ercot.com/gridinfo/planning

[3] ERCOT Letter to Commissioners - Follow-up Status Update on Permian

2 Study Assumptions and Methodology

ERCOT reviewed the RPG project submitted by Oncor and confirmed the submitted project aligns with the Permian Basin Load Interconnection 'Preferred' Projects IDs 1, 2, 3 and 25. As such, for this independent review, ERCOT utilized the study results from the 2021 Permian Basin Load Interconnection Study. Furthermore, ERCOT reviewed the 2023 RTP final reliability case to confirm the project need.

2.1 Study Assumptions for Reliability Analysis

ERCOT conducted the Permian Basin Load Interconnection Study in 2021 based on criteria contained in NERC reliability standard TPL-001-4, ERCOT Nodal Protocol and Planning Guide. The Permian Basin Load Interconnection also examined a number of transmission upgrade options to address the aggregate reliability needs within the Permian Basin. For this reason, no additional options were identified and examined for this independent review.

The following sections describe the study assumptions of this review using a 2023 RTP final case.

2.1.1 Steady-State Study Base Case

A Final 2023 RTP case, published on the Market Information System (MIS) on December 22, 2023, was used as reference case. The 2028 Summer season was selected for the study. The steady-state study base case for the West and Far West Weather Zones was constructed by updating transmission, generation, and loads and using the following 2028 Summer Peak Load Flow case as reference:

- 2023RTP_2028_SUM_WFW_12222023[4]

2.1.2 Transmission Topology

Transmission projects listed in Table 2.1, identified in the 2023 RTP as placeholders for West Texas 345-kV Infrastructure Rebuild Project, were removed to develop the study base case.

[4] 2023RTP_Final_Reliability

Table 2.1 Transmission Projects Removed from Study Base Case

RTP Project ID	Project Name	TSP	County
2021-FW19	Morgan Creek SES - Longshore Switch 345-kV Line Upgrade	ONCOR	Mitchell, Howard
2022-WFW2	Midessa South SW - Consavvy - Longshore Switch - Morgan Creek SES 345-kV Line Upgrades	ONCOR	Midland, Howard, Mitchell
2023-WFW2	Morgan Creek SES - Falcon Seaboard - Midland East 345-kV Line Upgrade	ONCOR	Scurry
2023-W12	Morgan Creek SES - Tonkawa 345-kV Line Rebuild	ONCOR	Mitchell

Transmission projects within the study area with ISD by June 2028 were added to the study base case. The ERCOT Transmission Project Information and Tracking (TPIT)[5] report from October 2023 was used as reference. The added TPIT projects are listed in Table 2.2 below.

Table 2.2 Transmission Projects Added to Study Base Case

TPIT Number	Project Name	County	Projected In-service Date	Planning Charter Tier
77146	Reconductor WNK-AAT-MDT-FSH	Winkler	Nov-23	Tier 4
70964	WETT 345 kV Volta witch	Howard	Jan-24	Tier 3
71968	Midkiff - Pemkiff 138 kV Line	Upton	May-24	Tier 4
73434	Shaw 138 kV POD	Reagan	May-24	Tier 4
76212	Model Coachwhip Sub	Ward	May-24	Tier 4
73408	Odysseus: Build new 345 kV Station	Coke	Oct-24	Tier 4
71960	Upgrade Grady - Expanse 138 kV Line	Martin	Dec-24	Tier 4
71989	Big Spring West - Stanton East 138 kV Line	Martin	Dec-24	Tier 4
73043	Peck – Driver 138-kV Line	Glasscock	Dec-24	Tier 2
76686	Add Hog Mountain 138 kV POD	Glasscock	Dec-24	Tier 4
76232	Reconductor Mivida-Coachwhip-Fishhook 2045 ACCC	Ward	May-26	Tier 4
76291	Upgraded Cedarville–BoneSpringsTap–Fishhook	Ward	May-26	Tier 4
76293	Upgraded Cedvale-MiDiva138KV	Ward	May-26	Tier 4
77320	Add CapBANK in COYANOSA	Ward	Jun-26	Tier 4
77803 77807	TNMP Silverleaf and Cowpen 345/138-kV Stations	Reeves, Ward	Jun-27	Tier 1
73368	Grey Well Draw - Buffalo 138 kV Second Circuit	Martin, Midland	Dec-24	Tier 3
78374	Rockhound 345/138-kV Switching Station	Martin, Midland	Dec-24	Tier 3

2.1.3 Generation

Based on the December 2023 Generator Interconnection Status (GIS) report posted on the ERCOT website in January 2024[6], generator additions planned to connect to the study area, before June 2028,

[5] https://www.ercot.com/gridinfo/planning
[6] https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER

and meeting Planning Guide Section 6.9(1) for inclusion in the planning models, that were not in the base case, were added to the study base case. These generator additions are listed in Table 2.3. All the new generation units added to the case were dispatched consistent with the 2023 RTP methodology.

Table 2.3 Generation Units Added to Study Case

GINR Number	Project Name	County	Capacity (MW)	Fuel	Projected Commercial Operation Date
23INR0387	Pioneer DJ Wind	Midland	140.3	WIN	05/03/2024
23INR0470	BoCo BESS	Borden	155.5	OTH	06/22/2024
24INR0273	Al Pastor BESS	Dawson	100.8	OTH	09/02/2024

The status of each unit that was projected to be either indefinitely mothballed or retired at the time of the study were reviewed. The units listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status.

Table 2.4: List of Generation Opened to Reflect Mothballed/Retired/Forced Outage Status

Bus No	Unit Name	Capacity (MW)	Weather Zone
110941	SL_SL_G1	65.0	Coast
110942	SL_SL_G2	65.0	Coast
110943	SL_SL_G3	30.0	Coast
110944	SL_SL_G4	30.0	Coast
130121	SGMTN_SIGNALM2	6.6	Far West

2.1.4 Loads

The load level of the Far West Weather Zone remains the same as in the 2023 RTP case. The loads outside of the study Weather Zone, excluding the West and Far West Weather Zones, were adjusted as necessary for power balance consistent with the 2023 RTP assumptions.

2.2 Study Assumptions for Congestion Analysis

2.2.1 Base Case

The 2028 economic final case from the 2023 RTP was used to develop a study base case for congestion analysis.

2.2.2 Transmission Topology

All RPG-approved Tier 1, 2, and 3 transmission projects in the study area as well as the Tier 4 projects in the study area expected to be in-service by 2028 were added to the study base case. The ERCOT TPIT report posted on October 2023, was used as reference. The added TPIT projects are listed in Appendix C.

2.2.3 Generation

Planned generators in the ERCOT system that met Planning Guide Section 6.9(1) conditions for inclusion in the base cases (based on the January 2024 GIS report) were added to the study base case. The added generators are listed in Appendix C.

2.2.4 Loads

Loads were maintained consistent with the 2023 RTP economic model for the year 2028.

2.3 Methodology

This section lists the Contingencies and Criteria used for project review along with the tools used to perform each of the various analyses.

2.3.1 Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocols, and ERCOT Planning Criteria.

Contingencies were updated based on the changes made to the topology as described in Section 2.1 of this document. The following steady-state contingencies were simulated for the study region:

- P0 (System Intact)
- P1, P2-1, P7 (N-1 conditions);
- P2-2, P2-3, P4, and P5 (Extra High Voltage (EHV) only);
- P3-1: G-1 + N-1 (G-1: Odessa Ector CC Train, Falcon Seaboard CC Train); and
- P6-2: X-1 + N-1 (X-1: 345/138-kV Consavvy 345/138-kV transformer, Einstein 345/138-kV transformers).

All 69-kV and above buses, transmission lines, and transformers in the study region were monitored (excluding generator step-up transformers) and the following thermal and voltage limits were enforced:

- Thermal
  - Rate A (normal rating) for pre-contingency conditions; and
  - Rate B (emergency rating) for post-contingency conditions.
- Voltages
  - Voltages exceeding pre-contingency and post-contingency limits; and
  - Voltage deviations exceeding 8% on non-radial load buses.

2.3.2 Study Tool

ERCOT utilized the following software tools to perform this independent review:

- PowerWorld Simulator version 23 was used for security constrained optimal power flow (SCOPF) and steady state contingency analysis
- UPLAN version 12.3.0.29978 was used to perform the congestion analysis

3 Project Need

ERCOT conducted the review of the Permian Basin Load Interconnection Study, and the 2023 RTP summer peak final reliability case based on the study assumptions and methodologies described in Section 2.

3.1 Review of the 2023 Regional Transmission Plan (RTP) Case

ERCOT evaluated the 2023 RTP 2028 Summer Peak case based on the study assumptions and methodologies described in Section 2. The study results showed thermal overloads under NERC Category P1, P2-1, P3, P6-2 and P7 contingency conditions that confirmed the reliability need and matched results from the PBLI as well as the Oncor submittal.

West Texas 345-kV Infrastructure Rebuild Project upgrade will address these thermal overloads under the N-1, G-1+N-1, X-1+N-1 contingency conditions that resulted in thermal overloads as shown in Table 3.1.

Table 3.1 Thermal Overloads in the 2023 RTP Case

Contingency Category	Thermal Overloads Base Case	Thermal Overloads West Texas 345-kV Infrastructure Rebuild Project Added
N-0 (P0)	None	None
N-1 (P1, P2-1, P7)	58 miles of 345-kV lines	None
G-1+N-1 (P3)	197 miles of 345-kV lines	None
X-1+N-1 (P6-2)	57 miles of 345-kV lines	None

3.2 Review of Permian Basin Load Interconnection Study Results

The Permian Basin Load Interconnection Study identified a set of transmission upgrades, especially long lead time local transmission upgrades, to connect and reliably serve the existing and projected oil and gas loads in the Permian Basin area utilizing the demand forecast from the IHS Markit study, which provides an in-depth analysis of the oil and gas industry and provides an electricity demand forecast in the Permian Basin area through 2030.

The results of the Permian Basin Load Interconnection Study reconfirmed the need for the West Texas 345-kV Infrastructure Rebuild Project upgrade to maintain grid reliability under N-1, G-1+N-1, X-1+N-1 contingency conditions that match those identified by the ERCOT independent review referenced in Section 3.1 of this report as well as those identified in the Oncor submittal.

More details of the Permian Basin Load Interconnection Study can be found in Appendix A while the Oncor submittal can be found in Appendix B.

4 Recommended Project

Based on this independent review and the Permian Basin Load Interconnection Study, ERCOT recommends the following project (West Texas 345-kV Infrastructure Rebuild Project):

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA.
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV:
    - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
    - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
  - Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
    - Morgan Creek to Eskota
    - Morgan Creek to Barber Lake West
    - Morgan Creek to Barber Lake East
    - Morgan Creek to Sun
    - Morgan Creek to Cosden
  - Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
    - Morgan Creek to Colorado City
    - Morgan Creek to Big Spring
  - Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch
- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers
- Construct a new Cattleman 345/138-kV Switch, approximately 2.0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA
- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:

- Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
- Morgan Creek to LCRA Gasconades adding approximately 2.13 miles of new ROW
- Morgan Creek to Consavvy
- Morgan Creek to Longshore

- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA
- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers
- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA
- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at

least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers

- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW
- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment at 3-breaker, ring bus, Quail East 345-kV Switch to at least 2988 MVA
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers

5 Additional Analysis and Assessment

The recommended West Texas 345-kV Infrastructure Rebuild Project is categorized as a Tier 1 project, pursuant to ERCOT Protocol Section 3.11.4.3(1)(a). As required by Planning Guide Section 3.1.3(4), ERCOT performed generation and load sensitivity studies to identify the preferred option performance. Additionally, a Sub-Synchronous Resonance (SSR) Assessment was performed.

5.1 Generation Addition Sensitivity Analysis

ERCOT performed a generation addition sensitivity analysis based on Planning Guide Section 3.1.3(4)(a).

Based on a review of the October 2023 GIS report, the following generators in the study area shown in Table 5.1 have a signed interconnection agreement (IA) but have not met all the conditions for inclusion in the case pursuant to Section 6.9(1) of the Planning Guide.

Table 5.1 Generation Units with Signed IA

GINR	Project Name	County	Fuel	Capacity (MW)
21INR0031	Indigo Solar	Fisher	Solar	125
23INR0300	Greater Bryant G Solar	Midland	Solar	42
21INR0268	Greyhound Solar	Ector	Solar	609
22INR0262	Deville Solar	Callahan	Solar	425
16INR0104	Big Sampson Wind	Crockett	Wind	400
23INR0086	Hanson Solar	Coleman	Solar	401
24INR0057	Hanson Storage	Coleman	Other	101
21INR0263	Monarch Creek Wind	Throckmorton	Wind	344
22INR0274	Crowded Star Solar II	Jones	Solar	189
21INR0207	Quantum Solar	Haskell	Solar	374
21INR0021	Green Holly Solar	Dawson	Solar	414
21INR0022	Red Holly Solar	Dawson	Solar	260
21INR0029	Green Holly Storage	Dawson	Other	50
21INR0033	Red Holly Storage	Dawson	Other	50
25INR0400	Maldives Solar (Alternate POI)	Scurry	Solar	184

These future resources did not have a material impact on the need for the West Texas 345-kV Infrastructure Rebuild Project.

5.2 Load Scaling Sensitivity Analysis

Per Planning Guide Section 3.1.3(4)(b), ERCOT evaluated the load scaling sensitivity and concluded that the load scaling assumed in the study case would not have any material impact on the project need because of the following reasons:

- The majority of the need is located in the northern section of the Far West Weather Zone, this region is remote enough from the rest of the ERCOT load as to not be affected by load scaling outside of the West and Far-West Weather Zones.
- The load scaling outside the stud area is not expected to have a material impact on the need for the West Texas 345-kV Infrastructure Rebuild Project.

5.3 Sub-synchronous resonance (SSR) Assessment

Pursuant to Protocol Section 3.22.1.3(2), ERCOT conducted an SSR screening assessment for the recommended West Texas 345-kV Infrastructure Rebuild Project and found no adverse SSR impacts to the existing and planned Generation Resources in the study area.

6 Congestion Analysis

ERCOT conducted a congestion analysis to identify any potential impact on system congestion related to the addition of the West Texas 345-kV Infrastructure Rebuild Project.

The results of the congestion analysis indicated no additional congestion in the area with the addition of the West Texas 345-kV Infrastructure Rebuild Project.

7 Conclusion

This report describes the ERCOT evaluation of the West Texas 345-kV Infrastructure Rebuild Project submitted Oncor. Based on the results of this independent review and the Permian Basin Load Interconnection Study, ERCOT recommends this RPG project to address the reliability need to accommodate the significant and rapid load growth in the area. The West Texas 345-kV Infrastructure Rebuild Project is estimated to cost $1.12 Billion and consists of the following upgrades:

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA.
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV:
    - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
    - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
  - Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
    - Morgan Creek to Eskota
    - Morgan Creek to Barber Lake West
    - Morgan Creek to Barber Lake East
    - Morgan Creek to Sun
    - Morgan Creek to Cosden
  - Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
    - Morgan Creek to Colorado City
    - Morgan Creek to Big Spring
  - Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch
- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers
- Construct a new Cattleman 345/138-kV Switch, approximately 2.0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA

- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:
  - Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
  - Morgan Creek to LCRA Gasconades adding approximately 2.13 miles of new ROW
  - Morgan Creek to Consavvy
  - Morgan Creek to Longshore
- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA
- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers
- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA

- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers
- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW
- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment at 3-breaker, ring bus, Quail East 345-kV Switch to at least 2988 MVA
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers

This project will require multiple CCN filings and the expected ISD for this project is summer 2028.

Appendix

Appendix A: Permian Basin Load Interconnection Study Report	ERCOT_Permian_Basin_Load_Interconn
Appendix B: Oncor West Texas 345-kV Infrastructure Rebuild Project RPG Submittal	Oncor West Texas 345 kV Infrastructur
Appendix C: Projects Added to Economics Case	Appenidx_C.pdf

ercot

Date: June 11, 2024
To: Board of Directors
From: Bob Flexon, Reliability and Markets (R&M) Committee Chair
Subject: Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group (RPG) Project

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: June 18, 2024
Item No.: 12.2

Issue:
Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should accept the recommendation of ERCOT staff to endorse the need for the Tier 1 Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group (RPG) Project in order to meet the reliability requirements for the ERCOT System and address thermal overloads and load growth in the in Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties in the West and Far West Weather Zones, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse.

Background/History:
Oncor proposed the West Texas 345-kV Infrastructure Rebuild Project in November 2023, a $1.12 billion, Tier 1 project with the expected in-service date of summer 2028, to meet reliability planning criteria. Protocol Section 3.11.4.7, Processing of Tier 1 Projects, requires ERCOT to independently review submitted projects. ERCOT verified the West Texas 345-kV Infrastructure Rebuild Project are components of the Preferred Project IDs 1, 2, 3 and 25 identified in the December 2021 Permian Basin Load Interconnection Study and addresses the need for a project under North American Electric Reliability Corporation (NERC) and ERCOT Planning Criteria to address thermal overloads on 218-miles of 345-kV transmission lines in Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties in the West and Far West Weather Zones with the following ERCOT System improvements:

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA;
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV:

ercot

  - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
  - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
  - Morgan Creek to Eskota
  - Morgan Creek to Barber Lake West
  - Morgan Creek to Barber Lake East
  - Morgan Creek to Sun
  - Morgan Creek to Cosden
- Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
  - Morgan Creek to Colorado City
  - Morgan Creek to Big Spring
- Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch;

- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA;
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers;
- Construct a new Cattleman 345/138-kV Switch, approximately 2.0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA;
- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:
  - Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
  - Morgan Creek to LCRA Gasconades adding approximately 2.13 miles of new ROW
  - Morgan Creek to Consavvy
  - Morgan Creek to Longshore
- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers;
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-

ercot

breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA;

- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW;
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers;
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers;
- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA;
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA;
- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers;
- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA;

ercot

- Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW

- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA;
- Upgrade all terminal equipment at 3-breaker, ring bus, Quail East 345-kV Switch to at least 2988 MVA;
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA;
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA;
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA;
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW;
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW;
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW;
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers; and
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers.

For construction to meet the summer 2028 in-service date, the West Texas 345-kV Infrastructure Rebuild Project requires Public Utility Commission of Texas (PUCT, Commission) approval of a Certificate of Convenience and Necessity. Oncor will work with ERCOT as early as practical to develop outage plans needed for construction and implement Constraint Management Plans (CMP) based on summer 2028 operational conditions.

ERCOT verified the West Texas 345-kV Infrastructure Rebuild Project are components of the Preferred Project IDs 1, 2, 3 and 25 identified in the December 2021 Permian Basin Load Interconnection Study and addresses the need in Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties in the West and Far West Weather Zones. ERCOT's independent review verified the reliability need for the West Texas 345-kV Infrastructure Rebuild Project to satisfy ERCOT Planning Guide Section 4.1.1.2(1)(a), 4.1.1.2(1)(c) and 4.1.1.2(1)(d), Reliability Performance Criteria. Contingencies are the loss of a common tower, loss of a single generating unit followed by a single transmission element or common tower outage and loss of a single 345/138-kV transformer followed by a single transmission element or common tower outage, respectively.

RPG considered project overviews during meetings in January 2024 and May 2024. Between January 2024 and May 2024, ERCOT staff presented scope and status updates at RPG meetings in January, February, March, April, and May. Pursuant to paragraph (2) of Protocol Section 3.11.4.9, Regional Planning Group Acceptance and ERCOT Endorsement, ERCOT presented the Tier 1 project to TAC for review and comment, and on May 22, 2024, TAC unanimously endorsed the project as recommended by ERCOT. Pursuant to paragraph (1)(a) of Protocol Section 3.11.4.3, Categorization of Proposed Transmission Projects, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Protocol Section 3.11.4.7(2) requires endorsement by the Board. Pursuant to Section 3.11.4.9, ERCOT's endorsement of a Tier 1 project is obtained upon affirmative vote of the Board. Section IV(B)(2)(a) of the R&M Committee Charter requires the R&M Committee to review and make a recommendation to the Board regarding any Tier 1 project.

ERCOT's assessment of the Sub-Synchronous Resonance (SSR) of existing facilities in the Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties in the West and Far West Weather Zones, conducted pursuant to Protocol Section 3.22.1.3, Transmission Project Assessment, yielded no adverse SSR impacts to the existing and planned generation resources at the time of the study. Results of the congestion analysis ERCOT conducted pursuant to Planning Guide Section 3.1.3, Project Evaluation, indicate no additional congestion in the area with the addition of the West Texas 345-kV Infrastructure Rebuild Project.

The project completion date may change depending on material acquisition, outage coordination, and construction. The estimated cost reflects the fact that the vast majority of the work necessary to complete the various project components will need to be performed on energized transmission elements and/or will require construction of temporary by-pass transmission facilities. Transmission Service Provider (TSP) cooperation with ERCOT could be necessary to develop and implement CMPs based on summer 2028 operational conditions.

ercot

The report describing the ERCOT Independent Review of the Oncor West Texas 345-kV Infrastructure Rebuild Project, including ERCOT staff's recommendation, is attached as ***Attachment A***.
Key Factors Influencing Issue: 1. ERCOT System improvements are needed to meet reliability planning criteria for the Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties in the West and Far West Weather Zones. 2. ERCOT verified the Oncor West Texas 345-kV Infrastructure Rebuild Project are components of the Preferred Project IDs 1, 2, 3 and 25 identified in the December 2021 Permian Basin Load Interconnection Study and addresses the thermal overloads. 3. Protocol Section 3.11.4.7 requires Board endorsement of a Tier 1 project, which is a project with an estimated capital cost of $100 million or greater pursuant to Protocol Section 3.11.4.3(1)(a). 4. TAC voted unanimously to endorse the Tier 1 Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group (RPG) Project, as recommended by ERCOT, on May 22, 2024.
Conclusion/Recommendation: ERCOT staff recommends, and the R&M Committee is expected to recommend, that the Board endorse the need for the Tier 1 Oncor West Texas 345-kV Infrastructure Rebuild RPG Project, which ERCOT staff has independently reviewed and which TAC has voted unanimously to endorse based on NERC and ERCOT reliability planning criteria.

ercot

ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.
BOARD OF DIRECTORS RESOLUTION

WHEREAS, pursuant to Section 3.11.4.3(1)(a) of the Electric Reliability Council of Texas, Inc. (ERCOT) Protocols, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Section 3.11.4.7 requires endorsement by the ERCOT Board of Directors (Board); and

WHEREAS, after due consideration of the alternatives, the Board deems it desirable and in the best interest of ERCOT to accept ERCOT staff's and the and Reliability and Markets (R&M) Committee's recommendations to endorse the need for the Tier 1 Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group Project, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted to endorse, based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria;

THEREFORE, BE IT RESOLVED, that the Board hereby endorses the need for the Tier 1 Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group Project, which ERCOT staff has independently reviewed and which TAC has voted to endorse, based on NERC and ERCOT reliability planning criteria, as recommended by ERCOT staff and the R&M Committee.

CORPORATE SECRETARY'S CERTIFICATE

I, Jonathan M. Levine, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its June 18, 2024 meeting, the Board passed a motion approving the above Resolution by unanimous voice vote with no abstentions.

IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of July, 2024.

Jonathan M. Levine
Assistant Corporate Secretary

ERCOT Independent Review of the Oncor West Texas 345-kV Infrastructure Rebuild Project

Document Revisions

Date	Version	Description	Author(s)
May 16, 2024	1.0	Final	Ben Richardson
		Reviewed by	Robert Golen, Prabhu Gnanam

Executive Summary

Oncor submitted the West Texas 345-kV Infrastructure Rebuild Project to the Regional Planning Group (RPG) on November 3, 2023. Oncor proposed this project to address load growth, load integration requests, the need to rebuild aging facilities and NERC TPL-001-5 reliability criteria violations. The expected in-service date (ISD) of this project is Summer 2028. This project is located in the West and Far West Weather Zones in Scurry, Mitchell, Howard, Glasscock, Martin, Midland, and Ector Counties.

ERCOT completed the Permian Basin Load Interconnection Study (PBLI)[1] in December 2021 to identify transmission upgrades, especially long lead time transmission upgrades, necessary to reliably serve the existing and projected oil and gas loads in the Permian Basin area. The Permian Basin area includes the Delaware Basin, Midland Basin, and Central Basin Platforms which covers most of the counties in the Far West Weather Zone plus five adjacent counties in the West Weather Zone. The geographic and reliability assessment scope of the West Texas 345-kV Infrastructure Rebuild Project are a subset of the Permian Basin Load Interconnection Study. The Permian Basin Load Interconnection Study stated that if the preferred upgrades identified in that study are submitted to Regional Planning Group (RPG) for review, ERCOT may use that study report as part of ERCOT Independent Review. The West Texas 345-kV Infrastructure Rebuild Project includes components of 'Preferred' Project IDs 1, 2, 3 and 25 identified by the Permian Basin Load Interconnection Study. More details of the Permian Basin Load Interconnection Study can be found in Appendix A.

Additionally, ERCOT completed an updated study which confirmed the need for this project and that the Oncor West Texas 345-kV Infrastructure Rebuild Project addresses the need.

Accordingly, based on this independent review, ERCOT recommends the following project as submitted by Oncor:

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA.
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV.
    - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
    - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
  - Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
    - Morgan Creek to Eskota
    - Morgan Creek to Barber Lake West
    - Morgan Creek to Barber Lake East
    - Morgan Creek to Sun
    - Morgan Creek to Cosden

[1] https://www.ercot.com/gridinfo/planning

- Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
  - Morgan Creek to Colorado City
  - Morgan Creek to Big Spring
- Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch

- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers
- Construct a new Cattleman 345/138-kV Switch, approximately 2 0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA
- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:
  - Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
  - Morgan Creek to LCRA Gasconades adding approximately 2.13 miles of new ROW
  - Morgan Creek to Consavvy
  - Morgan Creek to Longshore
- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA
- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers

- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA
- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers
- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW
- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment at 3-breaker. ring bus, Quail East 345-kV Switch to at least 2988 MVA
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW

- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers

The recommended project is a Tier 1 project estimated to cost $1.12 Billion. The estimated cost reflects the fact that the vast majority of the work necessary to complete the various project components will need to be performed on energized transmission elements and/or will require construction of temporary by-pass transmission facilities. The project is recommended for construction to meet a summer 2028 ISD. However, Oncor has advised that the projected in-service date may change based on requirements for various approvals, ROW acquisition and construction progress.

Multiple Certificate of Convenience and Necessity (CCN) filings will be required for this transmission project. Oncor will work with ERCOT as early as practical to develop outage plans needed for construction and implement Constraint Management Plans (CMP) based on summer 2028 operational conditions.

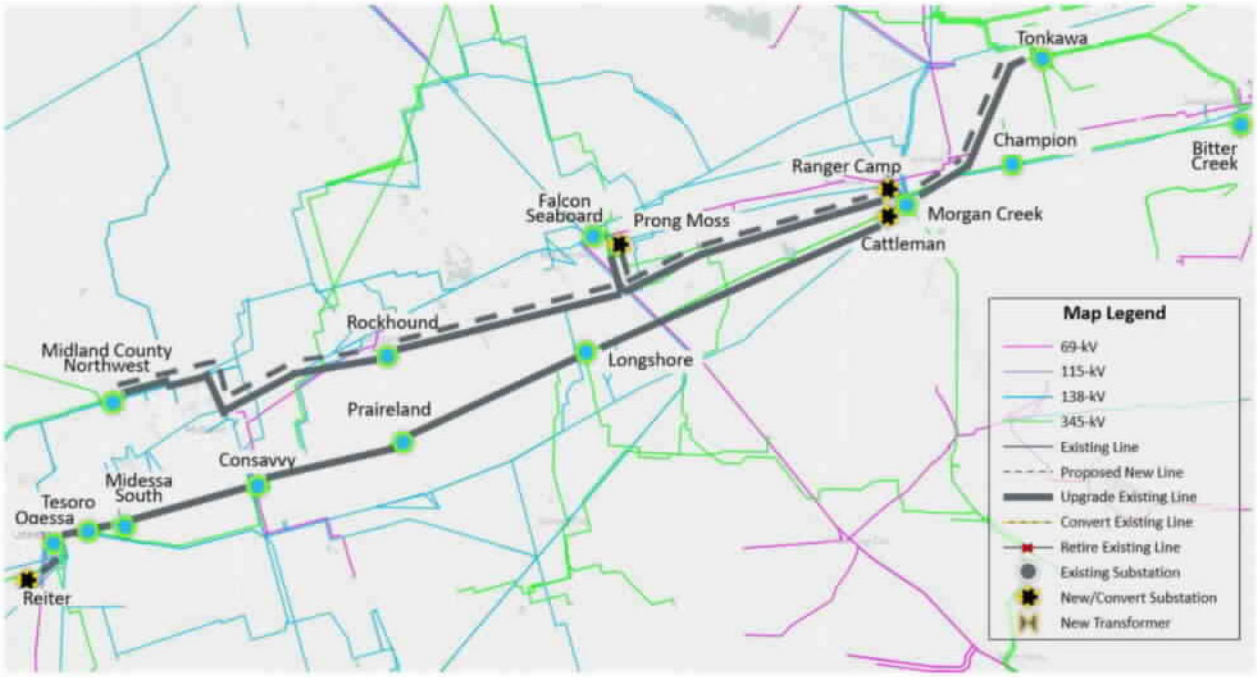

Figure E.1: Map of Recommended Upgrades

Table of Contents

1 Introduction

As part of the continuing efforts to address challenges in the Permian Basin, ERCOT completed the Permian Basin Load Interconnection Study (PBLI)[2] in December 2021 through extensive review and input by TSPs and stakeholders.

The PBLI identified the reliability challenges and a set of transmission upgrades, especially long lead time transmission upgrades, to connect and reliably serve the existing and projected oil and gas loads in the Permian Basin area utilizing the demand forecast from the IHS Markit study[3]. The IHS Markit study is a customer demand study performed by IHS Markit, which provides an in-depth analysis of the oil and gas industry and provides an electricity demand forecast in the Permian area through 2030. According to the IHS Markit study report, the demand forecast was based on geology and resource assessment, industry intelligence, oil and gas expertise, commercial considerations, translations of historical and forecasted oil and gas activities into electric load demands in every single square mile in the Permian Basin area.

As shown in Appendix A, the Permian Basin Load Interconnection Study identified both preferred and placeholder transmission upgrades and stated that "If the preferred upgrades identified in [PBLI] are submitted to Regional Planning Group (RPG) for review, ERCOT may use [PBLI] as part of the ERCOT Independent Review" Some components of PBLI "Preferred upgrades" have already been submitted and approved by ERCOT and the RPG. The Oncor West Texas 345-kV Infrastructure Rebuild Project presents and re-confirms justification for PBLI 'Preferred' Projects IDs 1, 2, 3 and 25.

Oncor submitted the West Texas 345-kV Infrastructure Rebuild Project for RPG review to address load growth, load integration requests and the need to rebuild aging facilities. This submittal is provided in Appendix B.

This RPG project has an estimated cost of $1.12 Billion and is classified as a Tier 1 project pursuant to Protocol Section 3.11.4.3. The estimated cost reflects the fact that the vast majority of the work necessary to complete the various project components associated with this project will need to be performed on energized transmission elements and/or will require construction of temporary by-pass transmission facilities. The project is recommended for construction to meet a summer 2028 in-service date (ISD). However, Oncor has advised that the projected ISD may change based on requirements for various approvals, right-of-way (ROW) acquisition and construction progress.

Multiple Certificate of Convenience and Necessity (CCN) filings will be required for this transmission project. Oncor has committed to work with ERCOT as necessary to develop and implement Constraint Management Plans based on summer 2028 operational conditions.

Since the primary components of the West Texas 345-kV Infrastructure project have already been analyzed and identified as preferred upgrades in the Permian Basin Load Interconnection Study, ERCOT conducted the independent review of this RPG project by updating study results and assumptions to check if any recent system changes would potentially alter or modify the projects recommended in these studies. The following sections describe the details of the updated study assumptions, methodology, and the results of the ERCOT Independent Review.

[2] https://www.ercot.com/gridinfo/planning

[3] ERCOT Letter to Commissioners - Follow-up Status Update on Permian

2 Study Assumptions and Methodology

ERCOT reviewed the RPG project submitted by Oncor and confirmed the submitted project aligns with the Permian Basin Load Interconnection 'Preferred' Projects IDs 1, 2, 3 and 25. As such, for this independent review, ERCOT utilized the study results from the 2021 Permian Basin Load Interconnection Study. Furthermore, ERCOT reviewed the 2023 RTP final reliability case to confirm the project need.

2.1 Study Assumptions for Reliability Analysis

ERCOT conducted the Permian Basin Load Interconnection Study in 2021 based on criteria contained in NERC reliability standard TPL-001-4, ERCOT Nodal Protocol and Planning Guide. The Permian Basin Load Interconnection also examined a number of transmission upgrade options to address the aggregate reliability needs within the Permian Basin. For this reason, no additional options were identified and examined for this independent review.

The following sections describe the study assumptions of this review using a 2023 RTP final case.

2.1.1 Steady-State Study Base Case

A Final 2023 RTP case, published on the Market Information System (MIS) on December 22, 2023, was used as reference case. The 2028 Summer season was selected for the study. The steady-state study base case for the West and Far West Weather Zones was constructed by updating transmission, generation, and loads and using the following 2028 Summer Peak Load Flow case as reference:

- 2023RTP_2028_SUM_WFW_12222023[1]

2.1.2 Transmission Topology

Transmission projects listed in Table 2.1, identified in the 2023 RTP as placeholders for West Texas 345-kV Infrastructure Rebuild Project, were removed to develop the study base case.

[1] 2023RTP_Final_Reliability

Table 2.1 Transmission Projects Removed from Study Base Case

RTP Project ID	Project Name	TSP	County
2021-FW19	Morgan Creek SES - Longshore Switch 345-kV Line Upgrade	ONCOR	Mitchell, Howard
2022-WFW2	Midessa South SW - Consavvy - Longshore Switch - Morgan Creek SES 345-kV Line Upgrades	ONCOR	Midland, Howard, Mitchell
2023-WFW2	Morgan Creek SES - Falcon Seaboard - Midland East 345-kV Line Upgrade	ONCOR	Scurry
2023-W12	Morgan Creek SES - Tonkawa 345-kV Line Rebuild	ONCOR	Mitchell

Transmission projects within the study area with ISD by June 2028 were added to the study base case. The ERCOT Transmission Project Information and Tracking (TPIT)[5] report from October 2023 was used as reference. The added TPIT projects are listed in Table 2.2 below.

Table 2.2 Transmission Projects Added to Study Base Case

TPIT Number	Project Name	County	Projected In-service Date	Planning Charter Tier
77146	Reconductor WNK-AAT-MDT-FSH	Winkler	Nov-23	Tier 4
70964	WETT 345 kV Volta witch	Howard	Jan-24	Tier 3
71968	Midkiff - Pemkiff 138 kV Line	Upton	May-24	Tier 4
73434	Shaw 138 kV POD	Reagan	May-24	Tier 4
76212	Model Coachwhip Sub	Ward	May-24	Tier 4
73408	Odysseus: Build new 345 kV Station	Coke	Oct-24	Tier 4
71960	Upgrade Grady - Expanse 138 kV Line	Martin	Dec-24	Tier 4
71989	Big Spring West - Stanton East 138 kV Line	Martin	Dec-24	Tier 4
73043	Peck – Driver 138-kV Line	Glasscock	Dec-24	Tier 2
76686	Add Hog Mountain 138 kV POD	Glasscock	Dec-24	Tier 4
76232	Reconductor Mivida-Coachwhip-Fishhook 2045 ACCC	Ward	May-26	Tier 4
76291	Upgraded Cedarville–BoneSpringsTap–Fishhook	Ward	May-26	Tier 4
76293	Upgraded Cedvale-MiDiva138KV	Ward	May-26	Tier 4
77320	Add CapBANK in COYANOSA	Ward	Jun-26	Tier 4
77803 77807	TNMP Silverleaf and Cowpen 345/138-kV Stations	Reeves, Ward	Jun-27	Tier 1
73368	Grey Well Draw - Buffalo 138 kV Second Circuit	Martin, Midland	Dec-24	Tier 3
78374	Rockhound 345/138-kV Switching Station	Martin, Midland	Dec-24	Tier 3

2.1.3 Generation

Based on the December 2023 Generator Interconnection Status (GIS) report posted on the ERCOT website in January 2024[6], generator additions planned to connect to the study area, before June 2028,

[5] https://www.ercot.com/gridinfo/planning
[6] https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER

and meeting Planning Guide Section 6.9(1) for inclusion in the planning models, that were not in the base case, were added to the study base case. These generator additions are listed in Table 2.3. All the new generation units added to the case were dispatched consistent with the 2023 RTP methodology.

Table 2.3 Generation Units Added to Study Case

GINR Number	Project Name	County	Capacity (MW)	Fuel	Projected Commercial Operation Date
23INR0387	Pioneer DJ Wind	Midland	140.3	WIN	05/03/2024
23INR0470	BoCo BESS	Borden	155.5	OTH	06/22/2024
24INR0273	Al Pastor BESS	Dawson	100.8	OTH	09/02/2024

The status of each unit that was projected to be either indefinitely mothballed or retired at the time of the study were reviewed. The units listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status.

Table 2.4: List of Generation Opened to Reflect Mothballed/Retired/Forced Outage Status

Bus No	Unit Name	Capacity (MW)	Weather Zone
110941	SL_SL_G1	65.0	Coast
110942	SL_SL_G2	65.0	Coast
110943	SL_SL_G3	30.0	Coast
110944	SL_SL_G4	30.0	Coast
130121	SGMTN_SIGNALM2	6.6	Far West

2.1.4 Loads

The load level of the Far West Weather Zone remains the same as in the 2023 RTP case. The loads outside of the study Weather Zone, excluding the West and Far West Weather Zones, were adjusted as necessary for power balance consistent with the 2023 RTP assumptions.

2.2 Study Assumptions for Congestion Analysis

2.2.1 Base Case

The 2028 economic final case from the 2023 RTP was used to develop a study base case for congestion analysis.

2.2.2 Transmission Topology

All RPG-approved Tier 1, 2, and 3 transmission projects in the study area as well as the Tier 4 projects in the study area expected to be in-service by 2028 were added to the study base case. The ERCOT TPIT report posted on October 2023, was used as reference. The added TPIT projects are listed in Appendix C.

2.2.3 Generation

Planned generators in the ERCOT system that met Planning Guide Section 6.9(1) conditions for inclusion in the base cases (based on the January 2024 GIS report) were added to the study base case. The added generators are listed in Appendix C.

2.2.4 Loads

Loads were maintained consistent with the 2023 RTP economic model for the year 2028.

2.3 Methodology

This section lists the Contingencies and Criteria used for project review along with the tools used to perform each of the various analyses.

2.3.1 Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocols, and ERCOT Planning Criteria.

Contingencies were updated based on the changes made to the topology as described in Section 2.1 of this document. The following steady-state contingencies were simulated for the study region:

- P0 (System Intact)
- P1, P2-1, P7 (N-1 conditions);
- P2-2, P2-3, P4, and P5 (Extra High Voltage (EHV) only);
- P3-1: G-1 + N-1 (G-1: Odessa Ector CC Train, Falcon Seaboard CC Train); and
- P6-2: X-1 + N-1 (X-1: 345/138-kV Consavvy 345/138-kV transformer, Einstein 345/138-kV transformers).

All 69-kV and above buses, transmission lines, and transformers in the study region were monitored (excluding generator step-up transformers) and the following thermal and voltage limits were enforced:

- Thermal
  - Rate A (normal rating) for pre-contingency conditions; and
  - Rate B (emergency rating) for post-contingency conditions.
- Voltages
  - Voltages exceeding pre-contingency and post-contingency limits; and
  - Voltage deviations exceeding 8% on non-radial load buses.

2.3.2 Study Tool

ERCOT utilized the following software tools to perform this independent review:

- PowerWorld Simulator version 23 was used for security constrained optimal power flow (SCOPF) and steady state contingency analysis
- UPLAN version 12.3.0.29978 was used to perform the congestion analysis

3 Project Need

ERCOT conducted the review of the Permian Basin Load Interconnection Study, and the 2023 RTP summer peak final reliability case based on the study assumptions and methodologies described in Section 2.

3.1 Review of the 2023 Regional Transmission Plan (RTP) Case

ERCOT evaluated the 2023 RTP 2028 Summer Peak case based on the study assumptions and methodologies described in Section 2. The study results showed thermal overloads under NERC Category P1, P2-1, P3, P6-2 and P7 contingency conditions that confirmed the reliability need and matched results from the PBLI as well as the Oncor submittal.

West Texas 345-kV Infrastructure Rebuild Project upgrade will address these thermal overloads under the N-1, G-1+N-1, X-1+N-1 contingency conditions that resulted in thermal overloads as shown in Table 3.1.

Table 3.1 Thermal Overloads in the 2023 RTP Case

Contingency Category	Thermal Overloads Base Case	Thermal Overloads West Texas 345-kV Infrastructure Rebuild Project Added
N-0 (P0)	None	None
N-1 (P1, P2-1, P7)	58 miles of 345-kV lines	None
G-1+N-1 (P3)	197 miles of 345-kV lines	None
X-1+N-1 (P6-2)	57 miles of 345-kV lines	None

3.2 Review of Permian Basin Load Interconnection Study Results

The Permian Basin Load Interconnection Study identified a set of transmission upgrades, especially long lead time local transmission upgrades, to connect and reliably serve the existing and projected oil and gas loads in the Permian Basin area utilizing the demand forecast from the IHS Markit study, which provides an in-depth analysis of the oil and gas industry and provides an electricity demand forecast in the Permian Basin area through 2030.

The results of the Permian Basin Load Interconnection Study reconfirmed the need for the West Texas 345-kV Infrastructure Rebuild Project upgrade to maintain grid reliability under N-1, G-1+N-1, X-1+N-1 contingency conditions that match those identified by the ERCOT independent review referenced in Section 3.1 of this report as well as those identified in the Oncor submittal.

More details of the Permian Basin Load Interconnection Study can be found in Appendix A while the Oncor submittal can be found in Appendix B.

4 Recommended Project

Based on this independent review and the Permian Basin Load Interconnection Study, ERCOT recommends the following project (West Texas 345-kV Infrastructure Rebuild Project):

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA.
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV:
    - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
    - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
  - Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
    - Morgan Creek to Eskota
    - Morgan Creek to Barber Lake West
    - Morgan Creek to Barber Lake East
    - Morgan Creek to Sun
    - Morgan Creek to Cosden
  - Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
    - Morgan Creek to Colorado City
    - Morgan Creek to Big Spring
  - Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch
- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers
- Construct a new Cattleman 345/138-kV Switch, approximately 2.0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA
- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:

- Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
- Morgan Creek to LCRA Gasconades adding approximately 2.13 miles of new ROW
- Morgan Creek to Consavvy
- Morgan Creek to Longshore

- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA
- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers
- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA
- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at

least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers

- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW
- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment at 3-breaker, ring bus, Quail East 345-kV Switch to at least 2988 MVA
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers

5 Additional Analysis and Assessment

The recommended West Texas 345-kV Infrastructure Rebuild Project is categorized as a Tier 1 project, pursuant to ERCOT Protocol Section 3.11.4.3(1)(a). As required by Planning Guide Section 3.1.3(4), ERCOT performed generation and load sensitivity studies to identify the preferred option performance. Additionally, a Sub-Synchronous Resonance (SSR) Assessment was performed.

5.1 Generation Addition Sensitivity Analysis

ERCOT performed a generation addition sensitivity analysis based on Planning Guide Section 3.1.3(4)(a).

Based on a review of the October 2023 GIS report, the following generators in the study area shown in Table 5.1 have a signed interconnection agreement (IA) but have not met all the conditions for inclusion in the case pursuant to Section 6.9(1) of the Planning Guide.

Table 5.1 Generation Units with Signed IA

GINR	Project Name	County	Fuel	Capacity (MW)
21INR0031	Indigo Solar	Fisher	Solar	125
23INR0300	Greater Bryant G Solar	Midland	Solar	42
21INR0268	Greyhound Solar	Ector	Solar	609
22INR0262	Deville Solar	Callahan	Solar	425
16INR0104	Big Sampson Wind	Crockett	Wind	400
23INR0086	Hanson Solar	Coleman	Solar	401
24INR0057	Hanson Storage	Coleman	Other	101
21INR0263	Monarch Creek Wind	Throckmorton	Wind	344
22INR0274	Crowded Star Solar II	Jones	Solar	189
21INR0207	Quantum Solar	Haskell	Solar	374
21INR0021	Green Holly Solar	Dawson	Solar	414
21INR0022	Red Holly Solar	Dawson	Solar	260
21INR0029	Green Holly Storage	Dawson	Other	50
21INR0033	Red Holly Storage	Dawson	Other	50
25INR0400	Maldives Solar (Alternate POI)	Scurry	Solar	184

These future resources did not have a material impact on the need for the West Texas 345-kV Infrastructure Rebuild Project.

5.2 Load Scaling Sensitivity Analysis

Per Planning Guide Section 3.1.3(4)(b), ERCOT evaluated the load scaling sensitivity and concluded that the load scaling assumed in the study case would not have any material impact on the project need because of the following reasons:

- The majority of the need is located in the northern section of the Far West Weather Zone, this region is remote enough from the rest of the ERCOT load as to not be affected by load scaling outside of the West and Far-West Weather Zones.
- The load scaling outside the stud area is not expected to have a material impact on the need for the West Texas 345-kV Infrastructure Rebuild Project.

5.3 Sub-synchronous resonance (SSR) Assessment

Pursuant to Protocol Section 3.22.1.3(2), ERCOT conducted an SSR screening assessment for the recommended West Texas 345-kV Infrastructure Rebuild Project and found no adverse SSR impacts to the existing and planned Generation Resources in the study area.

6 Congestion Analysis

ERCOT conducted a congestion analysis to identify any potential impact on system congestion related to the addition of the West Texas 345-kV Infrastructure Rebuild Project.

The results of the congestion analysis indicated no additional congestion in the area with the addition of the West Texas 345-kV Infrastructure Rebuild Project.

7 Conclusion

This report describes the ERCOT evaluation of the West Texas 345-kV Infrastructure Rebuild Project submitted Oncor. Based on the results of this independent review and the Permian Basin Load Interconnection Study, ERCOT recommends this RPG project to address the reliability need to accommodate the significant and rapid load growth in the area. The West Texas 345-kV Infrastructure Rebuild Project is estimated to cost $1.12 Billion and consists of the following upgrades:

- Construct a new Ranger Camp 345/138/69-kV substation, approximately 1.0 miles north of the existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 14-breaker 345-kV breaker-and-a-half bus arrangement, and a 16-breaker, 138-kV breaker-and-a-half arrangement with one new 177 MVA (nameplate) 138/69-kV transformer, and a 2-breaker 69-kV single bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, 138-kV at least 765 MVA and 69-kV at least 239 MVA.
  - Disconnect the following 345-kV lines at Morgan Creek and terminate at new Ranger Camp 345-kV:
    - Morgan Creek to Falcon Seaboard adding approximately 1.4 miles of new Right of Way (ROW)
    - Morgan Creek to Tonkawa adding approximately 0.94 miles of new ROW
  - Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 138-kV:
    - Morgan Creek to Eskota
    - Morgan Creek to Barber Lake West
    - Morgan Creek to Barber Lake East
    - Morgan Creek to Sun
    - Morgan Creek to Cosden
  - Disconnect the following 69-kV transmission lines at Morgan Creek and terminate at new Ranger Camp 69-kV:
    - Morgan Creek to Colorado City
    - Morgan Creek to Big Spring
  - Relocate the existing 177 MVA (nameplate) 138/69-kV transformer from Morgan Creek Switch to new Ranger Camp Switch
- Construct a new breaker-and-a-half rung with two new 345-kV breakers at Tonkawa 345-kV Switch. New breakers will be rated at least 2988 MVA
- Rebuild Morgan Creek (Ranger Camp) to Tonkawa 345-kV transmission line, replace with two new Morgan Creek (Ranger Camp) to Tonkawa 345-kV lines, with conductors rated to at least 2988 MVA, in existing (estimated 21.3 miles) ROW, installed on new, common double-circuit towers
- Construct a new Cattleman 345/138-kV Switch, approximately 2.0 miles southwest of existing Morgan Creek 345/138-kV Switch, with two new 600 MVA (nameplate) 345/138-kV transformers, a 15-breaker 345-kV breaker-and-a-half bus arrangement and a 9-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA and 138-kV at least 765 MVA

- Disconnect the following 345-kV transmission lines at Morgan Creek and terminate at new Cattleman 345-kV:
  - Morgan Creek to Champion Creek/LCRA Bitter Creek double circuit transmission lines adding approximately 1.25 miles of new ROW
  - Morgan Creek to LCRA Gasconades adding approximately 2 13 miles of new ROW
  - Morgan Creek to Consavvy
  - Morgan Creek to Longshore
- Disconnect the following 138-kV transmission lines at Morgan Creek and terminate at new Cattleman 138-kV:
  - Morgan Creek to McDonald Road using new ROW
- Construct two new Cattleman to Ranger Camp 345-kV transmission lines, with conductors rated to at least 2988 MVA, in a new (estimated 4.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek 138-kV Switch, in existing Morgan Creek 345/138-kV Switchyard from existing 12-breaker double-bus arrangement to a new 10-breaker 138-kV breaker-and-a-half bus arrangement. All 138-kV equipment will be rated at least 765 MVA
- Construct two new Morgan Creek to Morgan Creek CT Yard 138-kV transmission lines, with conductors rated to at least 614 MVA in existing (estimated 0.1 miles) ROW
- Construct two new Morgan Creek to Ranger Camp 138-kV transmission lines, with conductors rated to at least 614 MVA, in existing (estimated 1.2 miles) ROW, installed on new, common double-circuit towers
- Construct two new Morgan Creek to Cattleman 138-kV transmission lines, with conductors rated to at least 614 MVA, adding new (estimated 2.48 miles) ROW, installed on new, common double-circuit towers
- Construct a new Prong Moss 345-kV Switch, approximately 29.4 miles southwest of existing Morgan Creek 345/138-kV Switch, and along the existing Morgan Creek to Midland East 345-kV corridor, and approximately 7.0 miles south of the existing Falcon Seaboard generating station in a 12-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap Prong Moss 345-kV Switch into existing Morgan Creek (Ranger Camp) to Falcon Seaboard 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Tap Prong Moss 345-kV Switch into Falcon Seaboard to Midland East 345-kV transmission line with, approximately 0.1 miles, new transmission line segment in new ROW
  - Rebuild Morgan Creek (Ranger Camp) to Prong Moss, replace with two new Morgan Creek (Ranger Camp) to Prong Moss 345-kV transmission lines with conductors rated at least 2988 MVA, in existing (estimated 29.4 miles) ROW installed on new, common double-circuit towers
  - Rebuild Prong Moss to Midland East 345-kV line, replace with two new Prong Moss to Midland East 345-kV transmission lines with conductors rated at least 2988 MVA, in existing estimated 41.2 miles) ROW, installed on new, common double-circuit towers
- Rebuild Midland County Northwest 345-kV Switch bus work and terminal equipment to be rated at least 2988 MVA, add one new 2-breaker 345-kV breaker-and-a-half rung rated to at least 2988 MVA

- Rebuild Midland East to Midland County Northwest 345-kV transmission line, replace with two new Midland East to Midland County Northwest 345-kV transmission lines, with conductors rated at least 2988 MVA, in 16.3 miles of existing ROW and 1.0 miles of new ROW, installed on new (estimated 17.3 miles) common double-circuit towers
- Rebuild Longshore 345-kV Switch, and upgrade from existing 6-breaker ring-bus configuration to a 11-breaker 345-kV breaker-and-a-half bus arrangement. All equipment will be rated at least 2988 MVA
  - Tap the rebuilt Longshore 345-kV Switch into Morgan Creek (Cattleman) to Consavvy 345-kV transmission line with approximately 0.1 miles of line in existing ROW
- Upgrade all terminal equipment at 2-breaker Midessa South 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment at 3-breaker, ring bus, Quail East 345-kV Switch to at least 2988 MVA
- Upgrade terminal equipment on two breaker-and-a-half rungs of Odessa EHV 345-kV Switch to at least 2988 MVA
- Upgrade all terminal equipment on both single breaker terminals and main bus at existing Odessa EHV 345-kV Switch to at least 2988 MVA
- Construct a new Reiter 345/138-kV Switch, approximately 3.0 miles south of the existing Odessa EHV 345/138-kV Switch along the existing Odessa EHV to Moss/Wolf 345-kV double-circuit transmission line, with two new 600 MVA (nameplate) 345/138-kV transformers, in a 12-breaker 345-kV breaker-and-a-half bus arrangement and a 10-breaker 138-kV breaker-and-a-half bus arrangement. All 345-kV equipment will be rated at least 2988 MVA, and 138-kV at least 765 MVA
- Tap new Reiter 345-kV Switch into existing Odessa EHV to Moss & Odessa EHV to Wolf 345-kV double-circuit transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 2987 MVA in new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Moss 138-kV transmission line with, approximately 0.2 miles, new transmission line segment rated to at least 614 MVA in a new ROW
- Tap new Reiter 138-kV Switch into existing Odessa EHV to Wolf 138-kV transmission line with, approximately 0.1 miles, new transmission line segment rated to at least 614 MVA in new ROW
- Upgrade Tesoro 345-kV Switch by adding two new breaker-and-a-half rungs with two new breakers rated to at least 2988 MVA on each of the two new rungs
- Construct two new Reiter to Tesoro 345-kV transmission lines, with conductors rated to at least 2988 MVA, in new (estimated 4.0 miles) ROW, installed on new, common double-circuit towers
- Rebuild Morgan Creek (Cattleman) to Odessa EHV 345-kV double-circuit transmission lines, with conductors rated to at least 2988 MVA, in existing (estimated 88.7 miles) ROW installed on common double-circuit towers

This project will require multiple CCN filings and the expected ISD for this project is summer 2028.

Appendix

Appendix A: Permian Basin Load Interconnection Study Report	ERCOT_Permian_Basin_Load_Interconn
Appendix B: Oncor West Texas 345-kV Infrastructure Rebuild Project RPG Submittal	Oncor West Texas 345 kV Infrastructur
Appendix C: Projects Added to Economics Case	Appenidx_C.pdf

ercot

GENERAL SESSION MINUTES OF THE BOARD OF DIRECTORS MEETING OF ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.

8000 Metropolis Drive (Building E), Suite 100, Boardroom B
Austin, Texas 78744
June 18, 2024

Pursuant to notice duly given, the meeting of the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) convened on the above-referenced date.

Meeting Attendance:

Board Members:

Director	Affiliation/Role (if any)	Voting Category
Aguilar, Carlos	N/A	Voting
Capuano, Linda	N/A	Voting
Cobos, Lori	Public Utility Commission of Texas (PUCT, Commission), Commissioner	Non-Voting
England, Julie	N/A	Voting
Flexon, Bob	N/A	Voting
Flores, Bill (Vice Chair)	N/A	Voting
Foster, Paul (Chair)	N/A	Voting
Gleeson, Thomas	PUCT Chair	Non-Voting
Heeg, Peggy	N/A	Voting
Hjaltman, Courtney	Office of Public Utility Counsel (OPUC), Public Counsel	Voting
Swainson, John	N/A	Voting
Vegas, Pablo	ERCOT President and Chief Executive Officer (CEO)	Non-Voting

Officers and Guests:

Officer/Guest	Role
Berlin, Anna	ERCOT Associate Corporate Counsel
Billo, Jeff	ERCOT Director of Operations Planning
Black, Robert	ERCOT Vice President of Public Affairs
Collins, Keith	ERCOT Vice President of Commercial Operations

ercot

Day, Betty	ERCOT Vice President of Security and Compliance and Chief Compliance Officer
Hobbs, Kristi	ERCOT Vice President of System Planning and Weatherization
Jackson, Kathleen	PUCT Commissioner
Levine, Jonathan	ERCOT Assistant General Counsel and Assistant Corporate Secretary
Martinez, Adam	ERCOT Vice President of Enterprise Risk and Strategy
McDonald, Jeff	Potomac Economics, ERCOT Independent Market Monitor (IMM) Director
Parakkuth, Jayapal	ERCOT Senior Vice President and Chief Information Officer
Rainwater, Kim	ERCOT Corporate Counsel
Rickerson, Woody	ERCOT Senior Vice President and Chief Operating Officer
Schue, Jamie	ERCOT Senior Corporate Counsel
Seely, Chad V.	ERCOT Senior Vice President, General Counsel and Corporate Secretary
Smith, Caitlin	Jupiter Power LLC, Technical Advisory Committee (TAC) Chair
Spak, Mara	ERCOT Vice President of Human Resources
Taylor, Sean	ERCOT Senior Vice President, Chief Financial Officer and Chief Risk Officer
Woodfin, Dan	ERCOT Vice President of System Operations
Zerwas, Rebecca	ERCOT Director of State Policy and PUC Relations, Board Liaison

Call General Session to Order (Agenda Item 1)
Paul Foster, Board Chair, determined that a quorum was present and called the Board meeting to order at approximately 10:01 a.m.

Chair Foster recognized Thomas Gleeson, Chairman of the PUCT. Chair Gleeson called an Open Meeting of the Commission to order to consider matters that had been duly posted with the Texas Secretary of State for June 18, 2024.

Chair Foster highlighted the Antitrust Admonition and addressed the following Agenda Items in the order below.

Notice of Public Comment, if Any (Agenda Item 2)
Chair Foster announced that on the agenda for the meeting, which was posted publicly on June 11, 2024, ERCOT had provided instructions for members of the public who were interested in commenting in person and that to date no individuals had expressed interest in commenting, which Chad Seely confirmed, noting commenters were available for Board questions, if any, regarding Agenda Item 9.1.1, NPRR1224, ECRS Manual Deployment Triggers – URGENT.

Consent Agenda; Unopposed Revision Requests Recommended by TAC for Approval (Agenda Items 3 – 3.1.12)
Chair Foster presented the Consent Agenda, including unopposed Revision Requests recommended by TAC for approval. Mr. Seely reviewed the cost impacts of the Revision Requests. Chair Foster entertained a motion to recommend approval of the Consent Agenda as follows:

ercot

- NPRR1198, Congestion Mitigation Using Topology Reconfigurations;
- NPRR1212, Clarification of Distribution Service Provider's Obligation to Provide an ESI ID;
- NPRR1218, REC Program Changes Per P.U.C. Subst. R. 25.173, Renewable Energy Credit Program;
- NPRR1220, Market Restart Approval Process Modifications;
- NPRR1222, Public Utility Commission of Texas Approval of the Methodology for Determining Ancillary Service Requirements;
- NPRR1223, Addition of TA Contact Information Into TDSP Application Form;
- NPRR1228, Continued One-Winter Procurements for Firm Fuel Supply Service (FFSS) – URGENT;
- NOGRR255, High Resolution Data Requirements;
- NOGRR258, Related to NPRR1198, Congestion Mitigation Using Topology Reconfigurations;
- PGRR112, Dynamic Data Model and Full Interconnection Study (FIS) Deadline for Quarterly Stability Assessment;
- PGRR113, Related to NPRR1198, Congestion Mitigation Using Topology Reconfigurations; and
- PGRR114, Related to NPRR1212, Clarification of Distribution Service Provider's Obligation to Provide an ESI ID

Bill Flores moved to recommend approval of the Consent Agenda as presented. Julie England seconded the motion. The motion passed by unanimous voice vote with no abstentions.

April 23, 2024 General Session Meeting Minutes (Agenda Item 4)
Chair Foster entertained a motion to approve the April 23, 2024 General Session Meeting Minutes (Minutes).

Peggy Heeg moved to approve the Minutes as presented. Mr. Flores seconded the motion. The motion passed by unanimous voice vote with no abstentions.

CEO Update (Agenda Item 5)
Pablo Vegas presented the CEO Update. Mr. Vegas highlighted ERCOT's work with Market Participants in advance of summer with hurricane preparedness and summer weatherization inspections and discussed the Reliability Roadmap for the remainder of 2024 and beyond. Board members and Mr. Vegas discussed the impact on ERCOT's dispatchable generation fleet of four rules the Environmental Protection Agency (EPA) finalized in April, raising a reliability risk, and ERCOT's continued support (which includes reliability analysis) of the State of Texas's litigation efforts as requested. Board members and Mr. Vegas discussed ERCOT's 2024 Innovation Summit. Board members and Commissioner Jackson discussed the timeline for the Commission's work on Demand Response following the Texas A&M University study that is nearing completion and a goal for recommendations to the Texas Legislature during the next Legislative session.

ercot

2024 Summer Outlook; 2024 Summer Weather and Operations (Agenda Items 6 and 6.1)
Dan Woodfin presented the 2024 Summer Weather and Operations. Board members and Mr. Woodfin discussed ERCOT's role in hurricane preparedness. Board members and Mr. Woodfin also discussed probabilistic assessments for summer 2024 demand and supply, as well as visibility needs into demand response from Large Flexible Loads and cryptominers.

2024 Summer Markets and Credit (Agenda Items 6.2)
Woody Rickerson presented the 2024 Summer Markets and Credit, including potential for impact during summer of 2024 on the relative frequency of self-commitment over Reliability Unit Commitment (RUC) action of November 2023 modifications to the Operating Reserve Demand Curve (ORDC) to include multi-step price floors; comparison of natural gas prices during the first quarter of 2024 to 2022 and 2023; and comparison of forward electricity prices in 2024 to 2022 and 2023.

Board Education – Load Forecasting (Agenda Item 7)
Jeff Billo presented Board Education – Load Forecasting. Board members and Mr. Billo discussed the extent to which Market Participants are compensated for price responsive demand, including economic decisions within the market such as lowering charges via ERCOT's Four Coincident Peak (4CP) Program; when exposed to wholesale market prices; or through thermostat programs offered by Retail Electric Providers. Discussion also included addressing challenges with machine-learning algorithms for behavioral modeling and significant changes to the Long-Term Load Forecast since Mr. Billo most recently presented Load Forecasting education to the Board two years ago, particularly regarding impacts of artificial intelligence and data centers.

Independent Market Monitor (IMM) 2023 State of the Market Report for the ERCOT Electricity Markets (Agenda Item 8)
Jeff McDonald, Director of Potomac Economics, presented the Independent Market Monitor (IMM) 2023 State of the Market Report for the ERCOT Electricity Markets. Board members and Mr. McDonald discussed effects on 2023 combustion turbine net revenues of ERCOT Contingency Reserve Service (ECRS). Discussion also included market incentives compared to Legislative provisions for new thermal dispatchable generation, and impact on investment decisions of fluctuating data for net revenues over the past six years. Mr. Rickerson and Mr. McDonald discussed IMM's work on bidding prices for batteries, and Board members and Mr. McDonald discussed the future role of grid reliability in IMM reporting and product transactions following Commission approval of a Reliability Standard for the ERCOT Region.

TAC Report; Non-Unanimous and Other Selected Revision Requests Recommended by TAC for Approval; NPRR1224, ECRS Manual Deployment Triggers – URGENT; NOGRR245, Inverter-Based Resource (IBR) Ride-Through Requirements – URGENT; Reliability and Markets (R&M) Committee Recommendations on Non-Unanimous and Other Selected Revision Requests (Agenda Items 9 – 9.2)
Caitlin Smith, TAC Chair, presented the TAC Report, which included TAC's non-unanimous recommendation for approval of NPRR1224, as well as TAC's non-unanimous recommendation for approval of NOGRR245 in June, following the Board, at its April 23, 2024 meeting, remanding the NOGRR to TAC to address the key reliability concerns identified by ERCOT.

ercot

Reliability and Markets (R&M) Committee Chair Bob Flexon reported the Committee considered NPRR1224 at its meeting the prior day and recommended, with one opposing vote by R&M Committee Member Courtney Hjaltman, approval of NPRR1224 as recommended by TAC, following the TAC Report and in-person comments by ERCOT staff, the IMM, Texas Industrial Energy Consumers, and Vistra. Mr. Flexon reported the Committee encourages stakeholder processing as expeditiously as possible of NPRR1232, Standing Deployment of ECRS in the Operating Hour for a Portion of ECRS that is Provided from SCED-Dispatchable Resources, since it provides for the automated release of ECRS to Security-Constrained Economic Dispatch (SCED) without the need for a manual ERCOT deployment instruction.

Mr. Flexon moved to recommend approval of NPRR1224 as recommended by TAC. Carlos Aguilar seconded the motion. The motion passed my unanimous voice vote with one abstention (Ms. Hjaltman).

Mr. Flexon reported on the R&M Committee's deliberations yesterday on NOGRR245, including TAC's Report and in-person comments by ERCOT staff and NextEra, and the R&M Committee's recommendation to table NOGRR245 to allow ERCOT staff, Joint Commenters, and any other stakeholders to develop language to bifurcate parts of the exemption process framework into a future Board Priority Revision Request. Mr. Flexon reported the Committee recognized possible need for special meetings of the R&M Committee and Board in July to consider NOGRR245.

Mr. Flexon moved to table NOGRR245. Ms. Heeg seconded the motion. The motion passed by voice vote with no abstentions.

Finance and Audit (F&A) Committee Report (Agenda Item 10)
Vice Chair Flores, F&A Committee Chair, reported that the F&A Committee met the prior day and highlighted items discussed at the F&A Committee meeting.

Human Resources and Governance (HR&G) Committee Report; Proposed Amendments to the Board Policies and Procedures; Ratification of Officer (Agenda Items 11 – 11.2)
Ms. Heeg, HR&G Committee Chair, reported the HR&G Committee met the prior day and recommended approval of proposed amendments to the Board Policies and Procedures to make clarifications and, following TAC feedback, regarding the Board process for Revision Requests. Ms. Heeg reported the HR&G Committee also recommended ratification of Keith Collins as ERCOT Vice President of Commercial Operations. Following a vote, Ms. Heeg highlighted other discussions from yesterday's meeting of the HR&G Committee.

Ms. Heeg moved to (1) approve the amendments to the Board Policies and Procedures, and (2) approve the ratification of Keith Collins, ERCOT Vice President of Commercial Operations, as an ERCOT Officer effective June 17, 2024, each as recommended by the HR&G Committee. John Swainson seconded the motion. The motion passed by unanimous voice vote with no abstentions.

Reliability and Markets (R&M) Committee Report; R&M Committee Charter; Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group (RPG) Project (Agenda Items 12 – 12.2)

Mr. Flexon highlighted additional items discussed at the R&M Committee meeting yesterday, including the Committee's recommendation to approve revisions to the R&M Committee Charter corresponding to amendments to the Board Policies and Procedures document and clarifying other R&M Committee practices.

Mr. Flexon moved to approve the R&M Committee Charter. Ms. Hjaltman seconded the motion. The motion passed by unanimous voice vote with no abstentions. Mr. Aguilar was not seated for this vote.

Mr. Flexon reported the R&M Committee's recommendation yesterday to endorse the Oncor West Texas 345-kV Infrastructure Rebuild Regional Planning Group (RPG) Project. Following a vote, Mr. Flexon highlighted other topics discussed during yesterday's meeting of the R&M Committee.

Mr. Flexon moved to endorse the need for the Tier 1 Oncor West Texas 345-kV Infrastructure Rebuild RPG Project, which ERCOT staff has independently reviewed and which TAC has voted unanimously to endorse, based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria. Ms. Heeg seconded the motion. The motion passed by unanimous voice vote with no abstentions.

Technology and Security (T&S) Committee Report (Agenda Item 13)
Mr. Swainson, T&S Committee Chair, reported the T&S Committee met the prior day and highlighted items discussed at the T&S Committee meeting.

Other Business (Agenda Item 14)
Chair Foster announced today would be his last meeting as Chair of the ERCOT Board and as a Board member, following a decision to step down effective the end of the day tomorrow, June 19, 2024. Chair Foster indicated Vice Chair Bill Flores will serve until a new Board Chair is selected by the ERCOT Board Selection Committee. Chair Foster shared what he has come to learn in his tenure as ERCOT Board Chair, complimented staff, and thanked the following for the opportunity to serve: Gov. Greg Abbott and Legislative leadership; PUC Chair Gleeson and the Commission; fellow Board members; Mr. Vegas and staff; and Market Participants.

Executive Session; Vote on Matters from Executive Session; Adjournment (Agenda Items 15 and 16)
Chair Foster reported that no voting items form Executive Session were expected; accordingly, he would adjourn the meeting immediately upon conclusion of Executive Session. Chair Foster recessed General Session at approximately 11:51 a.m. and convened Executive Session at approximately 12:17 p.m.

There were no voting items from Executive Session.

Chair Foster adjourned the meeting upon conclusion of Executive Session at approximately 2:55 p.m.

Board materials and presentations from the meeting are available on ERCOT's website at https://www.ercot.com/committees/board.

Chad V. Seely
Corporate Secretary