



Item 5.1: 25RPG013 & 25RPG017 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Regional Planning Group (RPG) Project

Kristi Hobbs
*Vice President, System Planning and
Weatherization*

Board of Directors Meeting

June 1-2, 2026

Purpose

Provide an overview of the \$477.7 million CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Tier 1 Reliability Project (Option 3A). Per ERCOT Protocol Section 3.11.4.7, Tier 1 projects require endorsement by the ERCOT Board of Directors (Board).

Voting Items

ERCOT staff requests and recommends that the Board endorse the CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station RPG Project (Option 3A) based on North American Electric Reliability Corporation (NERC) and Electric Reliability Council of Texas, Inc (ERCOT) reliability planning criteria.

Key Takeaways

- Ensuring ERCOT's leadership for grid reliability and resilience, the Project has completed RPG review and received an independent assessment from ERCOT staff and unanimous endorsement by the Technical Advisory Committee (TAC).
- ERCOT studied several options and recommends Option 3A as it addresses all project needs in the study area, meets ERCOT and NERC reliability criteria, improves long-term load-serving capability, and is feasible for construction.

CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station RPG Project

CPS submitted the Reactive Power Planning Project (25RPG013) for Reginal Planning Group (RPG) review in May 2025 and the Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (25RPG017) for RPG review in June 2025.

The purpose of these projects is to address the reliability issues in Bexar County in the South Central Weather Zone.

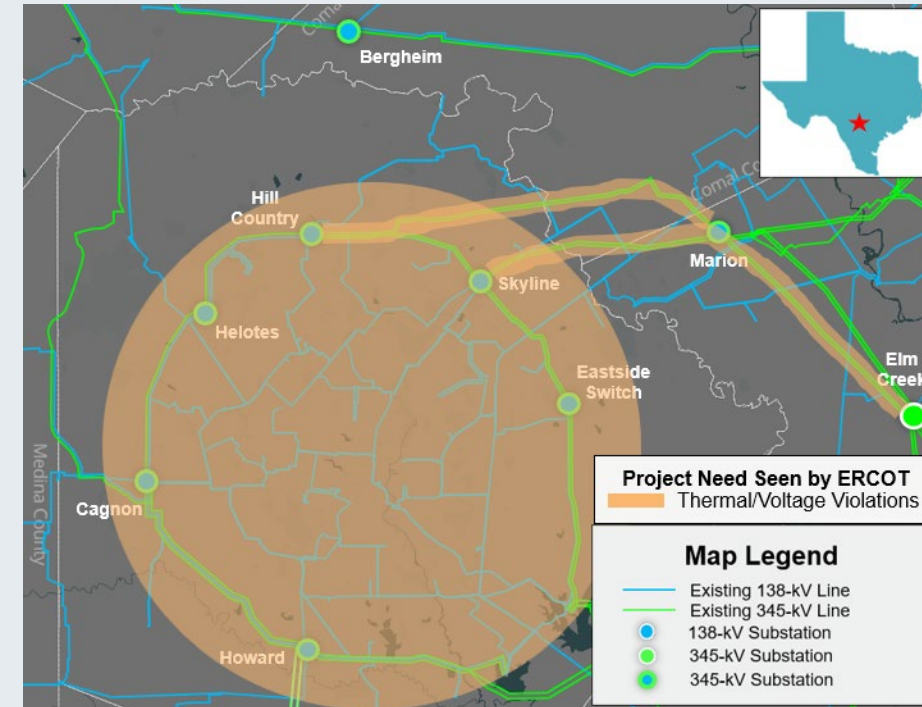
ERCOT performed a single independent review of the two projects and identified thermal overloads, voltage violations and unsolved power flows in Bexar County.

ERCOT’s endorsement of the project is based on the reliability need to relieve **thermal overloads** on ~111.7 miles of 345-kV and ~49.7 miles of 138-kV, four (4) 345/138-kV transformers, 145 **voltage violations** and 40 **unsolved power flows** Bexar County to meet NERC and ERCOT reliability planning criteria.

ERCOT Presented the project and TAC voted unanimously to endorse the project on May 19, 2026.

Key Takeaway: The CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project has completed RPG review and received unanimous endorsement by TAC.

Thermal Overloads and Voltage Violations Seen by ERCOT



Basis for ERCOT Board Endorsement

ERCOT's independent review identified a reliability need for the CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (Option 3A) to satisfy:

NERC TPL-001-5.1 Table 1 Reliability Criteria for category:

- P1, P3 and P6-2 contingencies

ERCOT Planning Guide Section Reliability Performance Criteria contingency:

- 4.1.1.2(1)(d): The contingency is a loss of a single generator followed by a single transmission element or common tower outage
- 4.1.1.2(1)(e): The contingency is a loss of a single transformer followed by a single transmission element or common tower outage

Key Takeaway: The CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (Option 3A) is needed to reliably meet NERC and ERCOT Planning Guide criteria.

Overall Project Summary

Convert the existing Helotes 138-kV substation into a new 345-kV switching substation looping into the adjacent 345-kV transmission lines;

Three (3) new 345/138-kV autotransformers;

Install sized capacitors totaling 270 MVAR;

Two (2) new STATCOMs totaling 600 MVAR;

Approximately 14.3 circuit-miles of new 345-kV transmission line; and

Approximately 43.1 circuit-miles of rebuilt 138-kV transmission lines.

A Certificate of Convenience and Necessity (CCN) is needed for the construction of the new Hill Country to Bergheim 345-kV transmission, for approximately 14.3 miles of new right of way (ROW).

Key Takeaway: The CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (Option 3A) will require a CCN due to approximately 14.3 miles of new ROW.

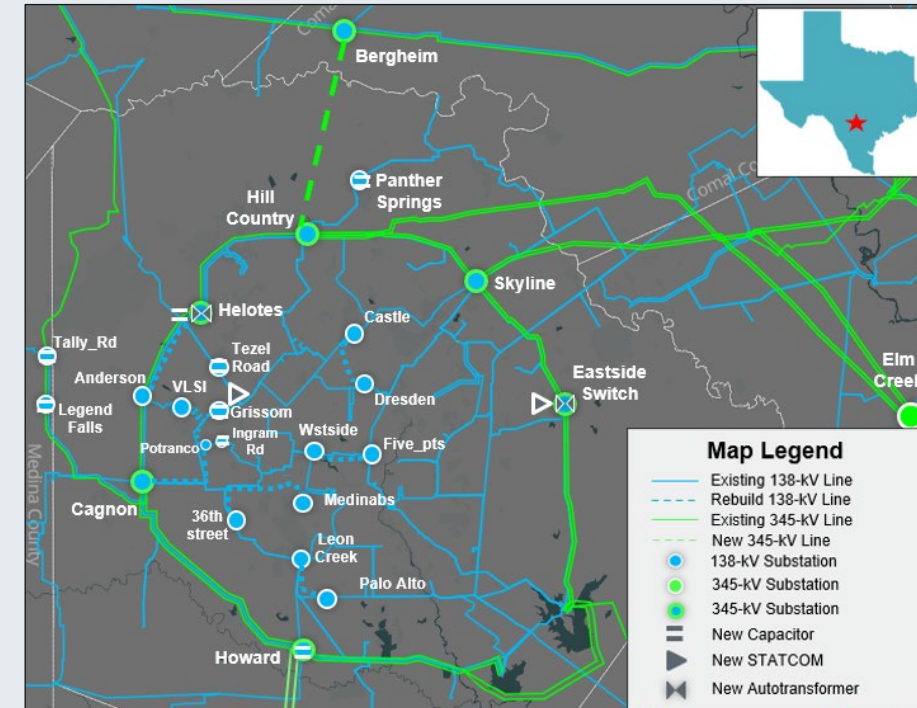
Request for Board Vote

ERCOT staff requests and recommends that the Board endorse the need for the CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (Option 3A) based on NERC and ERCOT reliability planning criteria.

The ERCOT Independent Review (EIR) is included as **Attachment A** to the Board Decision Template.

Key Takeaway: ERCOT studied several options and recommends Option 3A as it addresses all project needs, meets ERCOT and NERC Reliability Standard, improves long-term load-serving capability, and is feasible for construction.

ERCOT Recommendation





Date: May 22, 2026
To: Board of Directors
From: Kristi Hobbs, Vice President, System Planning and Weatherization (ERCOT)
Subject: 25RPG013 & 25RPG017 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Regional Planning Group (RPG) Project

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: June 1-2, 2026

Item No.: 5.1

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 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Regional Planning Group (RPG) Project in order to meet the reliability requirements for the ERCOT System and address thermal overloads, in Lamar, Franklin and Titus counties in the North, North Central and East Weather Zones, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse.

Background/History:

CPS proposed the CPS Reactive Power Planning Project in May 2025, a \$116.5 million, Tier 1 project with the expected in-service date (ISD) of December 2029, and the CPS Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project in June 2025, a \$110.0 million, Tier 1 project with the expected ISD of Summer 2029, to meet reliability planning criteria in Bexar County in the South Central Weather Zone. Protocol Section 3.11.4.7, Processing of Tier 1 Projects, requires ERCOT to independently review submitted projects. ERCOT performed a combined independent review of the CPS Reactive Power Planning Project and the CPS Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project and identified thermal overloads, voltage violations and unsolved power flows in Bexar County. The ERCOT project recommendation (Option 3A), a \$477.7



million, Tier 1 project with the expected ISD of October 2031 addresses the need for a project under North American Electric Reliability Corporation (NERC) and ERCOT Planning Criteria to address thermal overloads on approximately 111.7 miles of 345-kV, 49.7 miles of 138-kV, four (4) 345/138-kV transformers, 145 voltage violations and 40 unsolved power flows in Bexar County with the following ERCOT System improvements:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;
 - Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration;
 - Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA; and
 - Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;
- Construct a new Hill Country to Bergheim 345-kV transmission line on double-circuit structures with one circuit in place, with normal and emergency ratings of at least 1,980 MVA, which will require a new ROW, for approximately 14.28 miles;
- Rebuild the existing Castle to Dresden 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.79 miles;
 - The existing infrastructure is approximately 55 years old with a current normal and emergency ratings of 206 MVA;
- Rebuild the existing Cagnon to Potranco 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 5.87 miles;
 - The existing infrastructure is approximately 54 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Leon Creek to Palo Alto 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.64 miles;
 - The existing infrastructure is approximately 30 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Medinabs to 36th Street 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 8.57 miles;
 - The existing infrastructure is approximately 52 years old with a current normal and emergency ratings of 213 MVA;
- Rebuild the existing Cagnon to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 8.74 miles;
 - The existing infrastructure is approximately 58 years old with a current normal and emergency ratings of 314 MVA;

- Rebuild the existing Five_pts to Wstside 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.78 miles;
 - The existing infrastructure is approximately 9 years old with a current normal and emergency ratings of 287 MVA;
- Rebuild the existing Grissom to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.03 miles;
 - The existing infrastructure is approximately 42 years old with a current normal and emergency ratings of 293 MVA;
- Rebuild the existing Anderson to Helotes 138-kV transmission line with normal and emergency ratings of at least 600 MVA, for approximately 5.67 miles;
 - The existing infrastructure is approximately 58 years old with a current normal and emergency ratings of 478 MVA;
- Install a 50 MVAR sized capacitor at the existing Helotes 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Howard 138-kV substation;
- Install a 35 MVAR sized capacitor at the existing Ingram Road 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Legend Falls 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Panther Springs 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Tally_Rd 138-kV substation;
- Install a 35 MVAR sized capacitor at the existing Tezel Road 138-kV substation;
- Install a 300 MVAR static synchronous compensator (STATCOM) with Grid-Forming Technology (GFM) at the existing Grissom 138-kV substation; and
- Install a 300 MVAR STATCOM with GFM at the existing Martinez 138-kV substation.

ERCOT's independent review verified the reliability need for the CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project to satisfy ERCOT Planning Guide Section 4.1.1.2(1)(d), Reliability Performance Criteria, contingency for the loss of a single generator followed by a single transmission element or common tower outage and 4.1.1.2(1)(e), Reliability Performance Criteria, contingency for the loss of a single transformer followed by a single transmission element or common tower outage.

RPG considered project overviews during meetings in July 2025 and April 2026. Between July 2025 and April 2026, ERCOT staff presented scope and status updates at RPG meetings in July, August, October, December 2025, January, February, March and April 2026. 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 the Technical Advisory Committee (TAC) for review and comment, and on May 19, 2026,



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.

ERCOT's assessment of the Subsynchronous Oscillations (SSO) of existing facilities in Bexar County in the South Central Weather Zone, conducted pursuant to Protocol Section 3.22.1.3, Transmission Project Assessment, yielded no adverse SSO 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, indicated no significant new congestion in the area with the addition of the CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (Option 3A).

The report describing the ERCOT Independent Review of the CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (Option 3A), including ERCOT staff's recommendation, is included as **Attachment A**.

Key Factors Influencing Issue:

1. ERCOT System improvements are needed to meet reliability planning criteria in Bexar County in the South Central Weather Zone.
2. ERCOT staff found the recommended set of improvements to be the most efficient solution for meeting the planning reliability criteria, addressing thermal overloads, voltage violations and unsolved power flows.
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 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Regional Planning Group (RPG) Project (Option 3A), as recommended by ERCOT, on May 19, 2026.

Conclusion/Recommendation:

ERCOT staff recommends that the Board endorse the need for the Tier 1 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station RPG Project (Option 3A), 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.



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 recommendation to endorse the need for the Tier 1 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Regional Planning Group Project (Option 3A), which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria;

THEREFORE, BE IT RESOLVED, that ERCOT is hereby authorized and approved to endorse the need for the Tier 1 CPS Combined Reactive Power Planning Project & Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Regional Planning Group Project (Option 3A), which ERCOT staff has independently reviewed, and which TAC has voted unanimously to endorse based on NERC and ERCOT reliability planning criteria.

CORPORATE SECRETARY'S CERTIFICATE

I, Brandon Gleason, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its June 1-2, 2026 meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of _____, 2026.

Brandon Gleason

Assistant Corporate Secretary



**ERCOT Independent Review
(EIR) of the Combined CPS
Energy (CPS) Reactive Power
Planning Project & CPS
Helotes 345/138-kV Switching
Station and Autotransformer
Addition at Eastside Switching
Station Project (25RPG013 &
25RPG017)**

Document Revisions

Date	Version	Description	Authors
5/12/2026	1	Final	Travis Head, Christian Danielson, Moinul Islam
		Reviewed by	Robert Golen, Sun Wook Kang, Prabhu Gnanam

Executive Summary

CPS Energy (CPS) submitted the CPS Energy Reactive Power Planning Project (RPP project) to the Electric Reliability Council of Texas' (ERCOT) Regional Planning Group (RPG) in May 2025. CPS proposed the RPP project to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide reliability criteria voltage violations in Bexar County in the South Central Weather Zone.

CPS' proposed RPP project was estimated to cost approximately \$116.5 million, was classified as a Tier 1 project under ERCOT Protocol Section 3.11.4.3, and would not require a Certificate of Convenience and Necessity (CCN) application.

CPS also submitted the CPS Energy Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (SSA project) to ERCOT's RPG in June 2025. CPS proposed this project to address NERC Reliability Standard TPL-001-5.1 and ERCOT Planning Guide reliability criteria thermal overloads in Bexar County in the South Central Weather Zone.

CPS' proposed SSA project was estimated to cost approximately \$110.0 million, was classified as a Tier 1 project under ERCOT Protocol Section 3.11.4.3, and would not require a Certificate of Convenience and Necessity (CCN) application.

ERCOT performed a single independent review for both of CPS' proposed RPP and SSA projects (hereinafter collectively referred to as the "combined project" or the "Tier 1 project") and identified reliability issues (e.g. thermal overloads, voltage violations, and unsolved power flows in Bexar County) in the combined project area. ERCOT evaluated four different transmission project options to implement the combined project in its ERCOT Independent Review (EIR).

Based on the EIR's study results described in the Section 5 and 6 of this report, ERCOT recommends Option 3A to address the reliability issues mentioned above. Option 3A consists of the following:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;

- Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration utilizing seven circuit breakers;
- Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA;
- Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;
- Construct a new Hill Country to Bergheim 345-kV transmission line on double-circuit structures with one circuit in place, with normal and emergency ratings of at least 1,980 MVA, which will require a new right of way (ROW), approximately 14.28 miles;
- Rebuild the existing Castle to Dresden 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 3.79 miles;
 - The existing infrastructure is approximately 55 years old with a current normal and emergency ratings of 206 MVA;
- Rebuild the existing Cagnon to Potranco 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 5.87 miles;
 - The existing infrastructure is approximately 54 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Leon Creek to Palo Alto 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 3.64 miles;
 - The existing infrastructure is approximately 30 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Medinabs to 36th Street 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 8.57 miles;
 - The existing infrastructure is approximately 52 years old with a current normal and emergency ratings of 213 MVA;
- Rebuild the existing Cagnon to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 8.74 miles;
 - The existing infrastructure is approximately 58 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Five_pts to Wstside 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 3.78 miles;
 - The existing infrastructure is approximately 9 years old with a current normal and emergency ratings of 287 MVA;
- Rebuild the existing Grissom to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, approximately 3.03 miles;

- The existing infrastructure is approximately 42 years old with a current normal and emergency ratings of 293 MVA;
- Rebuild the existing Anderson to Helotes 138-kV transmission line with normal and emergency ratings of at least 600 MVA, approximately 5.67 miles;
 - The existing infrastructure is approximately 58 years old with a current normal and emergency ratings of 478 MVA;
- Install a 50 MVAr sized capacitor at the existing Helotes 138-kV substation;
- Install a 50 MVAr sized capacitor at the existing Howard 138-kV substation;
- Install a 35 MVAr sized capacitor at the planned Ingram Road 138-kV substation;
- Install a 25 MVAr sized capacitor at the existing Legend Falls 138-kV substation;
- Install a 50 MVAr sized capacitor at the existing Panther Springs 138-kV substation;
- Install a 25 MVAr sized capacitor at the existing Tally_Rd 138-kV substation;
- Install a 35 MVAr sized capacitor at the existing Tezel Road 138-kV substation;
- Install a 300 MVAr static synchronous compensator (STATCOM) with Grid-Forming Technology (GFM) at the existing Grissom 138-kV substation; and
- Install a 300 MVAr STATCOM with GFM at the existing Martinez 138-kV substation.

The cost estimate for this Tier 1 project using Option 3A is approximately \$477.7 million. A CCN application will be required for the construction of the new 345-kV line from the existing Hill County substation to the existing Bergheim substation due to approximately 14.28 miles of new ROW. A portion of this combined project will be owned by CPS, and the other portion will be owned by the LCRA Transmission Services Corporation (LCRA TSC). The expected in-service date (ISD) for CPS' portion of this combined project is December 2029, and the expected ISD of LCRA TSC's portion of this combined project is October 2031.

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1. Introduction

In May 2025, CPS Energy (CPS) submitted the CPS Energy Reactive Power Planning Project (RPP project) to the Electric Reliability Council of Texas' (ERCOT) Regional Planning Group (RPG) to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide reliability criteria voltage violations in Bexar County in the South Central Weather Zone.

CPS' proposed RPP project was classified as a Tier 1 project pursuant to ERCOT Nodal Protocol Section 3.11.4.3 with an estimated cost of \$116.5 million. A Certificate of Convenience and Necessity (CCN) application would not be required, and the expected in-service date (ISD) for this project is December 2029.

In June 2025, CPS submitted the CPS Energy Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project (SSA project) to ERCOT's RPG to address NERC Reliability Standard TPL-001-5.1 and ERCOT Planning Guide reliability criteria thermal overloads in Bexar County in the South Central Weather Zone.

CPS' proposed project was classified as Tier 1 project pursuant to ERCOT Nodal Protocol Section 3.11.4.3, with an estimated cost of \$110.0 million. A CCN application would not be required, and the expected ISD for this project is Summer 2029.

ERCOT conducted a single independent review for both of CPS' proposed RPP and SSA projects (hereinafter collectively referred to as the "combined project" or the "Tier 1 project") to identify any reliability needs in the area and evaluated various transmission upgrade options. This report describes the study assumptions, methodology, and results of the ERCOT Independent Review (EIR) of the project of the combined project.

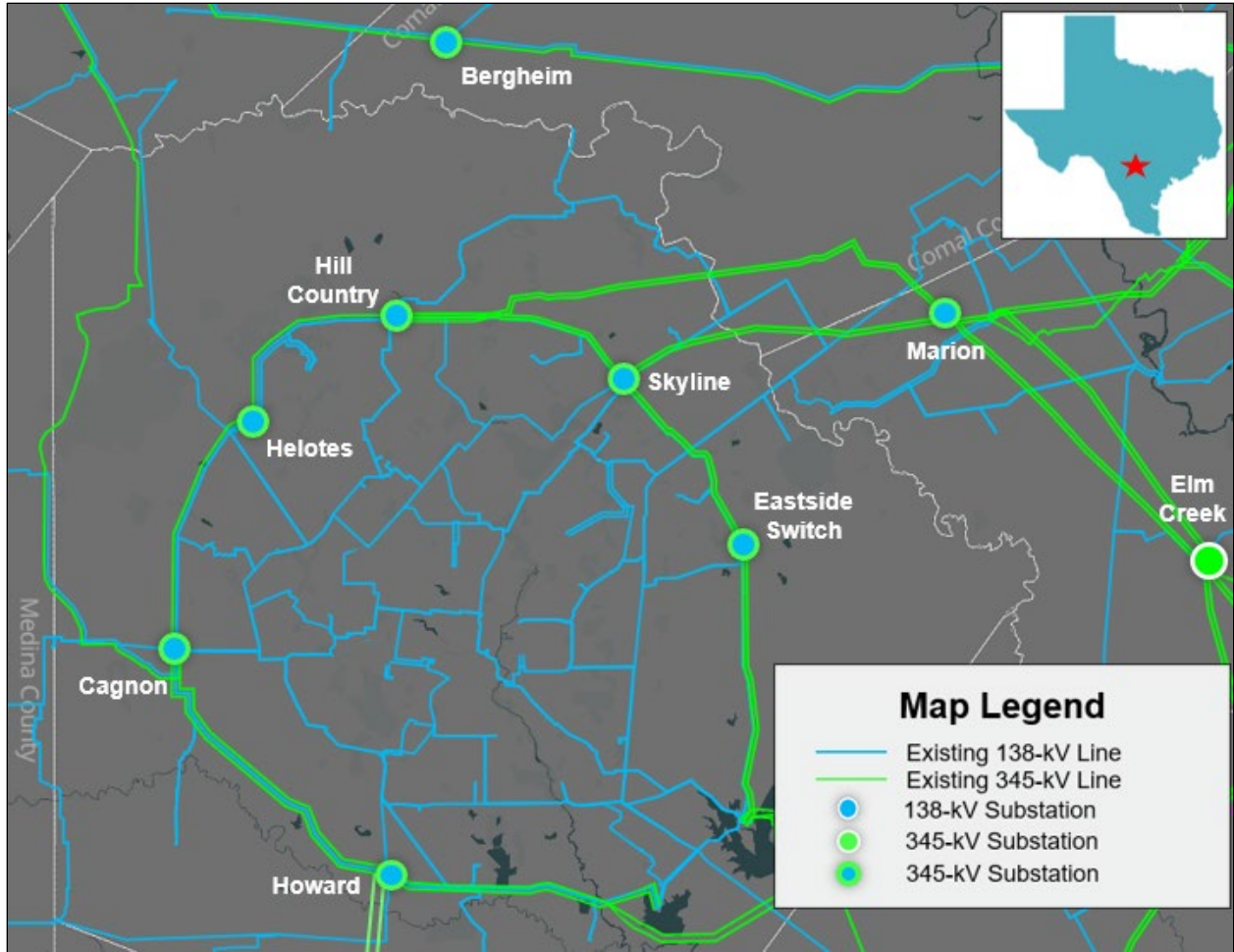


Figure 1.1: Map of Transmission System in the Study Area

2. Study Assumptions and Methodology

ERCOT performed studies under various system conditions to identify any reliability issue and to determine transmission upgrades to support CPS' proposed combined project, if an upgrade is deemed necessary. This section describes the study assumptions and criteria used to conduct the independent study.

2.1. Study Assumptions for Reliability Analysis

This combined project is in the South Central Weather Zone in Bexar County.

2.1.1. Steady State Study Base Case

The Final 2024 Regional Transmission Plan (RTP) cases, published on the Market Information System (MIS) on December 22, 2024, were used as reference cases in this study. The 2030 Summer Peak Load case was selected for the long-term outlook. The steady-state study base case was constructed by updating transmission, generation, and load data of the 2030 Summer Peak Load case noted below:

- Case: 2024RTP_2030_SUM_12222024¹.

2.1.2. Transmission Topology

Transmission projects within the study area with ISDs by December 2029 were added to the study base case. The ERCOT Transmission Project Information and Tracking (TPIT)² report posted in February 2025 was used as reference to identify the applicable projects added to the study base case as listed in Table 2.1.

Table 2.1: List of Transmission Projects Added to the Study Base Case

TPIT No	Project Name	Tier	Project ISD	TSP	County
89912	GVEC_Olmos to Wilson 138 kV TL, T297	4	12/01/26	GVEC	Guadalupe

¹ 2024 Regional Transmission Plan Postings: <https://mis.ercot.com/secure/data-products/grid/regional-planning>

² TPIT Report: <https://www.ercot.com/gridinfo/planning>

Table 2.2 lists the transmission projects identified in the 2024 RTP as placeholder projects in the study area that were not approved by RPG and were therefore removed from study base case.

Table 2.2: List of Transmission Projects Removed from the Study Base Case

RTP Project Index	Project Name	County
2024-SC19	Hillje (44200) to Zorn (7042) 345-kV Line Upgrades	Wharton, Fayette, Bastrop, Caldwell, Guadalupe
2024-SC26	Shaula (5380) to Elm Creek (5133) to Cachena (5068) 345-kV Line Upgrades	Wilson, Guadalupe, Dewitt

2.1.3. Generation

Based on the June 2025 Generator Interconnection Status (GIS)³ report posted on the ERCOT website in July 2025, generators in the study area that met Planning Guide Section 6.9(1) conditions with a commercial operations date (COD) prior to December 2029 were added to the study base case. These generation additions are listed in Table 2.3. All new generation dispatches were consistent with the 2024 RTP methodology.

Table 2.3: List of Generation Added to the Study Base Case Based on the June 2025 GIS Report

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
20INR0162	Diamondback Solar	SOL	12/31/2027	203.8	Starr
21INR0359	Hickerson Solar	SOL	11/21/2025	311.1	Bosque
22INR0220	Lamkin Solar	SOL	08/08/2027	101.5	Comanche
22INR0239	Rockefeller Storage	BESS	06/01/2027	206.8	Schleicher
22INR0437	TORMES SOLAR	SOL	03/31/2027	382.1	Navarro
22INR0457	Anson BAT	BESS	08/01/2026	150.6	Jones
22INR0605	Camino Santiago Solar	SOL	02/18/2027	196.3	Milam
23INR0078	Shaw Solar	SOL	04/29/2026	124.7	Bandera
23INR0181	Starling Storage	BESS	05/15/2027	63.6	Gonzales
23INR0225	MRG GOODY SOLAR	SOL	05/02/2026	170.8	Lamar
23INR0479	Taormina Storage	BESS	05/26/2029	231.9	Bexar
23INR0538	Roadrunner Crossing BESS SLF	BESS	12/31/2025	150.4	Eastland
24INR0126	High Noon Storage	BESS	05/09/2028	94.0	Hill
24INR0181	Bynum Solar Project	SOL	12/01/2025	56.0	Coryell

³ GIS Report: <https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER>

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
24INR0188	Tehuacana Creek Solar SLF	SOL	03/10/2027	505.5	Navarro
24INR0189	Tehuacana Creek BESS SLF	BESS	03/10/2027	419.0	Navarro
24INR0305	MRG Goody Storage	BESS	05/02/2026	52.3	Lamar
24INR0355	Anatole Renewable Energy Storage	BESS	03/31/2027	207.8	Henderson
24INR0364	Pitts Dudik II	SOL	02/04/2026	30.2	Hill
24INR0386	Black & Gold Energy Storage	BESS	06/30/2027	254.6	Menard
24INR0453	Longfellow BESS I	BESS	01/31/2026	55.0	Pecos
24INR0455	Longfellow BESS II	BESS	01/31/2026	105.8	Pecos
24INR0493	Crowned Heron BESS 2	BESS	03/31/2026	154.2	Fort Bend
24INR0528	Blanquilla BESS	BESS	05/15/2026	200.8	Nueces
24INR0533	Padua Grid BESS Unit 2	BESS	03/15/2026	150.9	Bexar
24INR0584	Houston IV BESS	BESS	06/03/2026	164.6	Harris
25INR0018	Yellow Cat Wind	WIN	04/01/2027	262.0	Navarro
25INR0046	Blue Skies BESS	BESS	12/31/2027	306.3	Hill
25INR0199	Bonham Solar 1	SOL	08/31/2026	138.4	Limestone
25INR0229	OCI Cobb Creek Solar	SOL	12/01/2026	203.1	Hill
25INR0233	OCI Cobb Creek ESS	BESS	12/01/2026	201.6	Hill
25INR0391	Purple Sage BESS 1	BESS	05/30/2027	156.0	Collin
25INR0392	Purple Sage BESS 2	BESS	05/30/2027	156.0	Collin
26INR0034	Bracero Pecan Storage	BESS	04/01/2027	232.0	Reeves
26INR0296	Sherbino II BESS SLF	BESS	02/08/2026	77.4	Pecos
26INR0543	Three Canes Solar SLF	SOL	03/10/2027	333.0	Navarro
28INR0024	Padua Grid BESS Unit 3	BESS	05/15/2026	201.4	Bexar

The status of each unit that was projected to be either indefinitely mothballed or retired at the time of the study was 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	Max Capacity (~MW)	Weather Zone
110205	BYU_BYU_G8	4.0	Coast
110124	DOWGEN_DOW_G66	95.6	Coast
151361	CHISMGRD_G1	20.3	North Central

Generation listed in Table 2.5 were closed (turned on) in the study base case to reflect the change in their Generation Resource as these resources are returning to year-round service.

Table 2.5: List of Generation Closed to Reflect Returning to Service Status

Bus No	Unit Name	Max Capacity (~MW)	Weather Zone
110020	WAP_GT2	71.0	Coast
150023	MCSES_UNIT8	568.0	North Central

2.1.4. Loads

Loads in the study area were revised based on the information provided in the Transmission Service Provider (TSP) Attestation Letter from CPS, for the expected 2030 study year. Large Loads in Bastrop, Caldwell, Comal, Guadalupe, Hays, and Travis counties were modified based on information provided by TSP Attestation Letter from LCRA Transmission Services Corporation (LCRA TSC), for the expected 2030 study year. The additional load shown in Table 2.6 was included in the 2024 RTP 2030 Summer Peak Load study case. Table 2.6 reflects CPS’s base load growth for summer 2030 and LCRA TSC’s large load projections. No load adjustments outside of the South Central Weather Zone were needed to maintain the minimum reserve requirements consistent with the 2024 RTP methodology.

Table 2.6: Additional Load by TSP

TSP	Year	Load (~MW)
CPS	2030	1,927
LCRA TSC	2030	3,213 ⁴

2.2. Long-Term Load-Serving Capability Assessment

ERCOT performed a long-term load-serving capability assessment to compare the performance of the study options.

Incremental load serving capability was evaluated to assess the long-term load-serving capability. Load in the study area was increased (customer designated as non-scalable

⁴ Large Load Interconnection numbers: LLI-118, LLI-1915, LLI-1966, LLI-1987, LLI-2002, LLI-2034, LLI-2058, LLI-2060, LLI-2162, LLI-2165, LLI-2213, LLI-2225, LLI-2268, and LLI-2318.

remained at the same level as in the study base case), and conforming loads outside of Bexar County were decreased to balance power.

2.3. Maintenance Outage Scenario

ERCOT performed a maintenance outage evaluation based on historic off-peak system load. Conforming loads in the South Central Weather Zone were scaled down to 80.3% of the summer peak load to create the off-peak case. Loads designated as non-scalable remained at the same level as in the study base case. Next, ERCOT Planning Guide Section 4.1.1.8 Maintenance Outage Reliability Criteria was evaluated to identify and address violations.

2.4. Study Assumptions for Dynamic Stability Analysis

ERCOT conducted a dynamic stability study utilizing the Dynamic Working Group (DWG) 2031 Summer Peak case as updated to match the topology of the case described in Section 2.1.1 of this report and to incorporate the transmission system upgrades included in Option 3A that were identified in the steady-state analysis. In alignment with the generation located in Bexar county shown in Table 2.3, the available dynamic data for generation beyond the units already included in the DWG 2031 Summer Peak case was utilized.

ERCOT undertook the following significant efforts to develop the study case:

- Updated dynamic data for additional generation units incorporated into the steady-state case;
- Updated the collector systems for the new units incorporated into the steady-state case;
- Updated dynamic data for the two static synchronous compensator (STATCOM) with Grid-Forming Technology (GFM) projects included in Option 3A using model information provided by CPS;
- Included existing dynamic load models provided by CPS; and
- Made necessary updates during the flat start case development after comparing the DWG case with the case utilized in this study.

2.5. Study Assumptions for Congestion Analysis

A congestion analysis was conducted to identify any new congestion in the study area with the addition of the preferred Option 3A transmission upgrade.

The 2024 RTP 2029 economic case was updated based on the June 2025 GIS⁵ report for generation updates and the February 2025 TPIT⁶ report for transmission updates to conduct the congestion analysis. The 2029 study year was selected as it is the future year case currently available.

New transmission project additions are listed in Table A.1.1 in the Appendix A of this document.

New generation additions listed in Table A.1.2 in Appendix A of this document were added to the economic base case and all generation listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status. Furthermore, the generation units listed in Table 2.5 were removed from seasonal settings in the study base case as these resources are returning to year-round service.

Further, the new load growth increases confirmed by TSP Attestation Letters from CPS and LCRA TSC (full load of approximately 5,140 MW) listed in Table 2.6 were added to the economic study cases.

2.6. Methodology

This section lists the contingencies and criteria used for the combined project review along with the tools used to perform the various analyses.

2.6.1. Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocols⁷, and the ERCOT Planning Guide⁸.

⁵ GIS Report: <https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER>

⁶ TPIT Report: <https://www.ercot.com/gridinfo/planning>

⁷ ERCOT Protocols: <https://www.ercot.com/mktrules/nprotocols/current>

⁸ ERCOT Planning Guide: <http://www.ercot.com/mktrules/guides/planning/current>

Contingencies⁹ were updated based on the changes made to the topology as described in Section 2.1 of this report. 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: generation outages) {Leon Creek U1 and Guadalupe Energy Center CTG 1}; and
- P6-2: (X-1+N-1) (X-1: 345/138-kV transformers only) {Cagnon X1, Howard Road X1, Hill Country X1, and Martinez X1}.

All 60-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.

2.6.2. Contingencies and Criteria for Dynamics Stability Analysis

ERCOT performed a limited dynamic stability study of ERCOT's preferred Option 3A in accordance with ERCOT Planning Guide¹⁰ Section 4 (Transmission Planning Criteria) and NERC Reliability Standard TPL-001-5.1. The study evaluated critical 138-kV and 345-kV P1, P2, P4, P5, P7, and ERCOT2 contingencies in the study area. The critical contingencies were selected based on engineering judgement, critical contingencies identified in the steady-state analysis, and additional contingencies provided by CPS.

Additionally, ERCOT performed a Fault-Induced Delayed Voltage Recovery (FIDVR) analysis using critical Single-Line-to-Ground (SLG) fault P4 and P7 events provided by

⁹ Details of each event and contingency category are defined in the NERC Reliability Standard TPL-001-5.1

¹⁰ ERCOT Planning Guide: <http://www.ercot.com/mktrules/guides/planning/current>

CPS to confirm that no FIDVR issue exists due to stalling residential air conditioning motor loads within CPS's service-area.

Monitored quantities included all 138-kV and 345-kV bus voltages and frequencies in the study area as well as active and reactive power for at least one unit in all generation projects in the study area.

For the dynamic stability analysis, the following criteria were enforced:

- For planning event P1: No generating unit shall pull out of synchronism. A generator being disconnected from the system by a fault clearing action or by a Remedial Action Scheme (RAS) is not considered pulling out of synchronism;
- For planning events P2-P7: When a generator pulls out of synchronism in the simulations, the resulting apparent impedance swings shall not result in the tripping of any transmission system elements other than the generating unit and its directly connected facilities;
- For any operating condition in category P1 of the NERC Reliability Standard addressing Transmission System Planning Performance Requirements, voltage shall recover to 0.90 p.u. within five seconds after clearing the fault;
- For any operating condition in category P2 – P7 of the NERC Reliability Standard addressing Transmission System Planning Performance Requirements, voltage shall recover to 0.90 p.u. within ten seconds after clearing the fault; and
- For any operating condition in categories P1 – P7 of the NERC Reliability Standard addressing Transmission System Planning Performance Requirements, power oscillation within the range of 0.2 Hz to 2 Hz decays with a minimum 3% damping ratio.

2.6.3. Study Tool

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

- PowerWorld Simulator version 24 for Security Constrained Optimal Power Flow and steady-state contingency analysis;
- Siemens PTI PSS/E (v.35.6): to perform time domain dynamic simulation of the electric network response to major disturbances; and
- UPLAN version 12.3.0.30786 to perform the congestion analysis.

3. Project Need

A steady-state reliability analysis was performed in accordance with NERC TPL-001-5.1 and ERCOT Planning Guide, as described in Section 2.6 of this report. This analysis indicated thermal overloads, voltage violations, and unsolved power flows in Bexar County under NERC P1(N-1), P7(N-1), P3(G-1+N-1), and P6-2(X-1+N-1) conditions. These issues are summarized in Table 3.1 and visually illustrated in Figure 3.1. The detailed thermal overloads are listed in Table 3.2. The voltage violations and unsolved power flows are listed in Table A.1.3 and Table A.1.4 in the Appendix A of this document, respectively. Additional thermal overloads, voltage violations, and unsolved power flows were observed in Bastrop, Caldwell, Comal, Guadalupe, Hays, and Travis counties that were deemed outside the study area and scope for this evaluation.

Table 3.1: Violations Observed Under NERC Reliability Standard TPL-001-5.1 and ERCOT Planning Guide in the Study Area

NERC Contingency Category	Thermal Overloads	Voltage Violations	Unsolved Power Flow
P0: N-0	None	None	None
P1, P2-1, P7: N-1	14 ¹¹	144 ¹¹	2 ¹¹
P2-2, P2-3, P4, P5	None	None	None
P3: (G-1+N-1)	12 ¹¹	144 ¹¹	37 ¹¹
P6-2: (X-1+N-1)	17 ¹¹	145 ¹¹	11 ¹¹

Table 3.2: Thermal Overloads Observed in the Study Area

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~miles)	Max Loading (%)
P3: (G-1+N-1)	CAGNON3_8 (5053) -> POTRANCO (5346) CKT 1	138	5.9	105.6
P3: (G-1+N-1)	LEON_CRK (5260) -> PALO_ALT (5330) CKT 1	138	3.6	110.0
P3: (G-1+N-1)	PALO_ALT (5330) -> CHAVANEA (5085) CKT 1	138	3.5	101.0
P6-2: (X-1+N-1)	CAGNON_5 (5056) -> CAGNON2_8 (5054) CKT 3	345/138	-	107.0
P6-2: (X-1+N-1)	CAGNON_5 (5056) -> CAGNON3_8 (5053) CKT 4	345/138	-	107.2

¹¹ Violations seen in the base case under P1 and P7 events were also seen under (G-1+N-1) and/or (X-1+N-1) events.

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~miles)	Max Loading (%)
P6-2: (X-1+N-1)	CAGNON1_8 (5055) -> VLSI (5467) CKT 1	138	8.7	117.0
P6-2: (X-1+N-1)	CAGNON2_8 (5054) -> ANDERSON (5003) CKT 1	138	4.6	101.6
P6-2: (X-1+N-1)	CASTLE (5080) -> DRESDEN (5130) CKT 1	138	3.8	107.3
P6-2: (X-1+N-1)	ELMCREEK (5133) -> SKYLINE_5 (5371) CKT 1	345	29.2	112.8
P6-2: (X-1+N-1)	ELMCREEK (5133) -> SKYLINE_5 (5371) CKT 2	345	29.2	106.4
P6-2: (X-1+N-1)	HAMWOLF (5187) -> BANDERA (5020) CKT 1	138	1.9	114.3
P6-2: (X-1+N-1)	HILLCTY_5 (5211) -> HILLCTY3_8 (5209) CKT 3	345/138	-	110.6
P6-2: (X-1+N-1)	HILLCTY_5 (5211) -> HILLCTY4_8 (5208) CKT 4	345/138	-	111.3
P6-2: (X-1+N-1)	HILLCTY3_8 (5209) -> LASIERRA (5257) CKT 1	138	2.3	102.1
P6-2: (X-1+N-1)	KIRBY (5250) -> ST_HEDWG (5410) CKT 1	138	2.7	102.7
P6-2: (X-1+N-1)	L_MARION5_1Y (7044) -> HILLCTY_5 (5211) CKT 1	345	26.7	108.6
P6-2: (X-1+N-1)	L_MARION5_1Y (7044) -> HILLCTY_5 (5211) CKT 2	345	26.6	108.8
P6-2: (X-1+N-1)	L_PARKWA8_1Y (7611) -> FRATT (5165) CKT 1	138	4.1	104.6
P6-2: (X-1+N-1)	MEDINABS (5305) -> 36TH_ST (5427) CKT 1	138	8.6	104.2

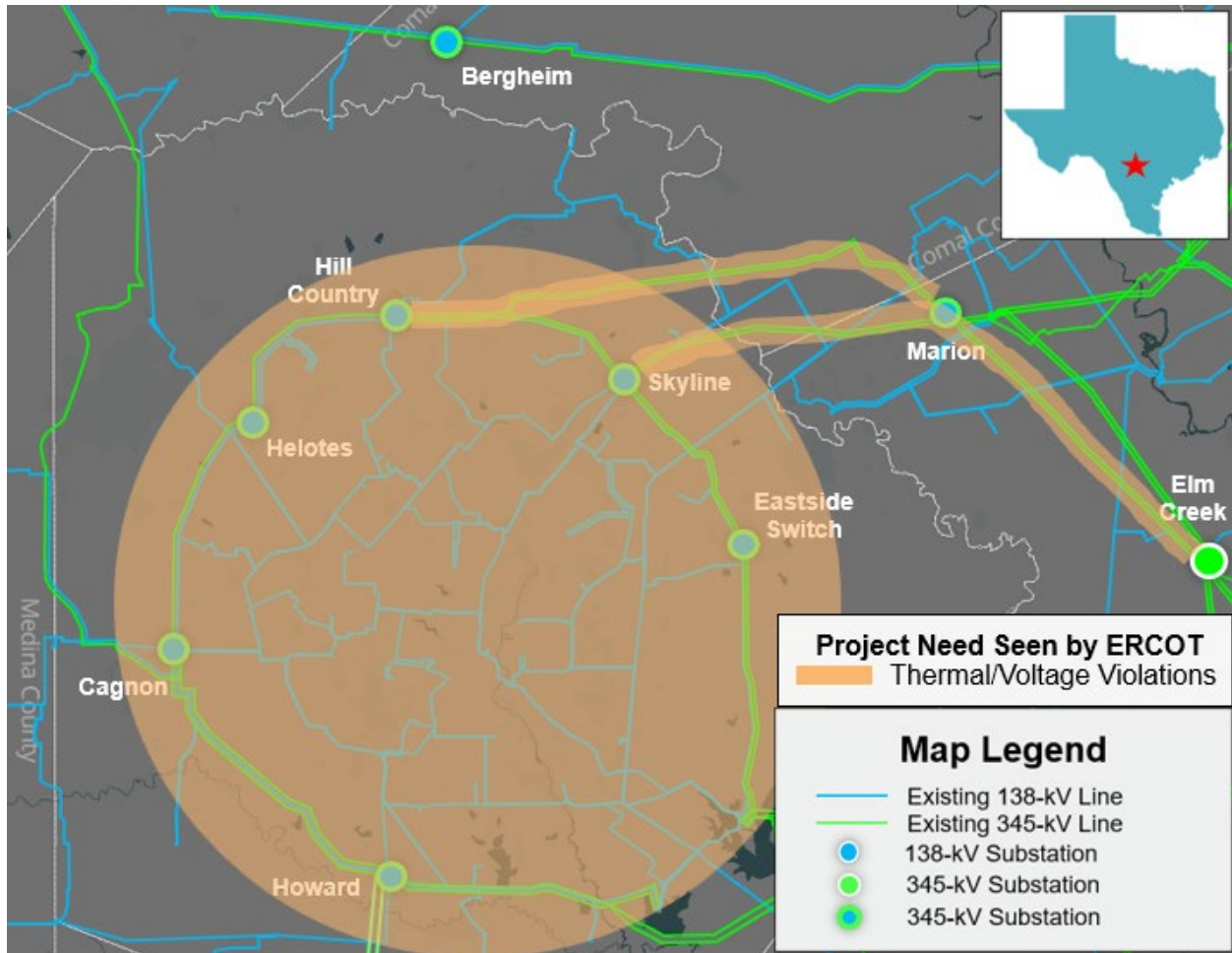


Figure 3.1: Study Area Map Showing Project Need Seen by ERCOT

4. Description of Project Options

ERCOT evaluated four system improvement options to address the reliability violations that were observed in the study base case in the study area.

Option 1 (CPS's Proposed Solution) consists of the following:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;
- Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration;
- Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA;
- Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;
- Install a 50 MVAR sized capacitor at the existing Anderson 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Hill Country 138-kV substation;
- Install a 25 MVAR sized capacitor at the planned Howard 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Legend Falls 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Tally_Rd 138-kV substation;
- Install a 300 MVAR STATCOM with GFM at the existing Grissom 138-kV substation; and
- Install a 300 MVAR STATCOM with GFM at the existing Martinez 138-kV substation.

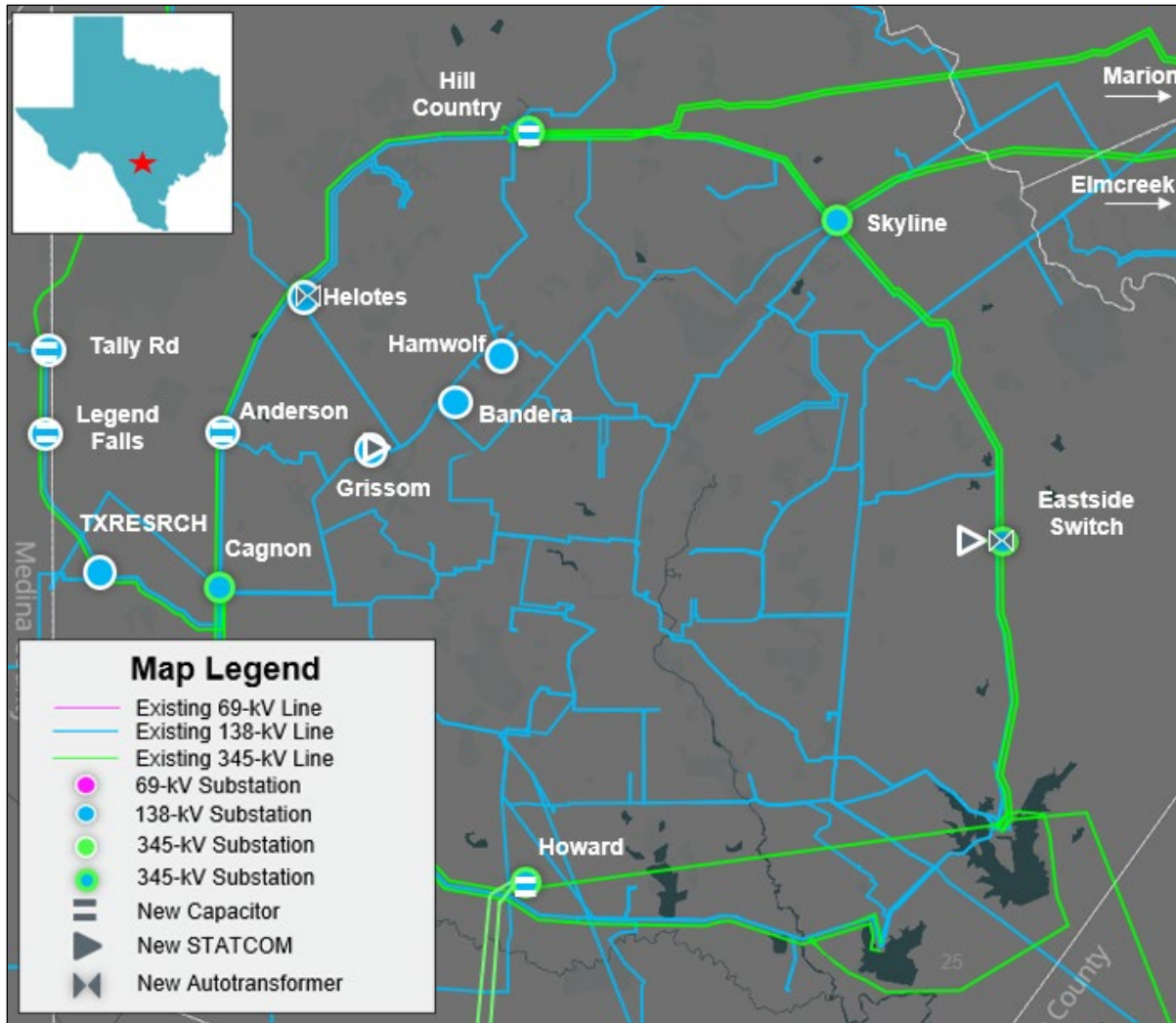


Figure 4.1: Map of Option 1

Option 2 consists of the following:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;
 - Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration;
 - Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA; and
 - Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;

- Construct a new Kendall to Helotes 345-kV transmission line on double-circuit structures with only one circuit in place, with normal and emergency ratings of at least 1,980 MVA, which will require a new right of way (ROW), for approximately 39.1 miles;
- Construct a new Elm Creek to Eastside 345-kV transmission line on double-circuit structures with only one circuit in place, with normal and emergency ratings of at least 1,980 MVA, which will require a new ROW, for approximately 23.4 miles;
- Rebuild the existing Kirby to St_Hedwg 138-kV transmission line on double-circuit structures with only one circuit in place where not sharing a common tower, with normal and emergency ratings of at least 478 MVA, for approximately 2.67 miles;
- Rebuild the existing Leon Creek to Palo Alto 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.64 miles;
- Install a 50 MVA_r sized capacitor at the existing Anderson 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Bandera 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Grissom 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Helotes 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Hill Country 138-kV substation;
and
- Install a 50 MVA_r sized capacitor at the existing Stonegate 138-kV substation.

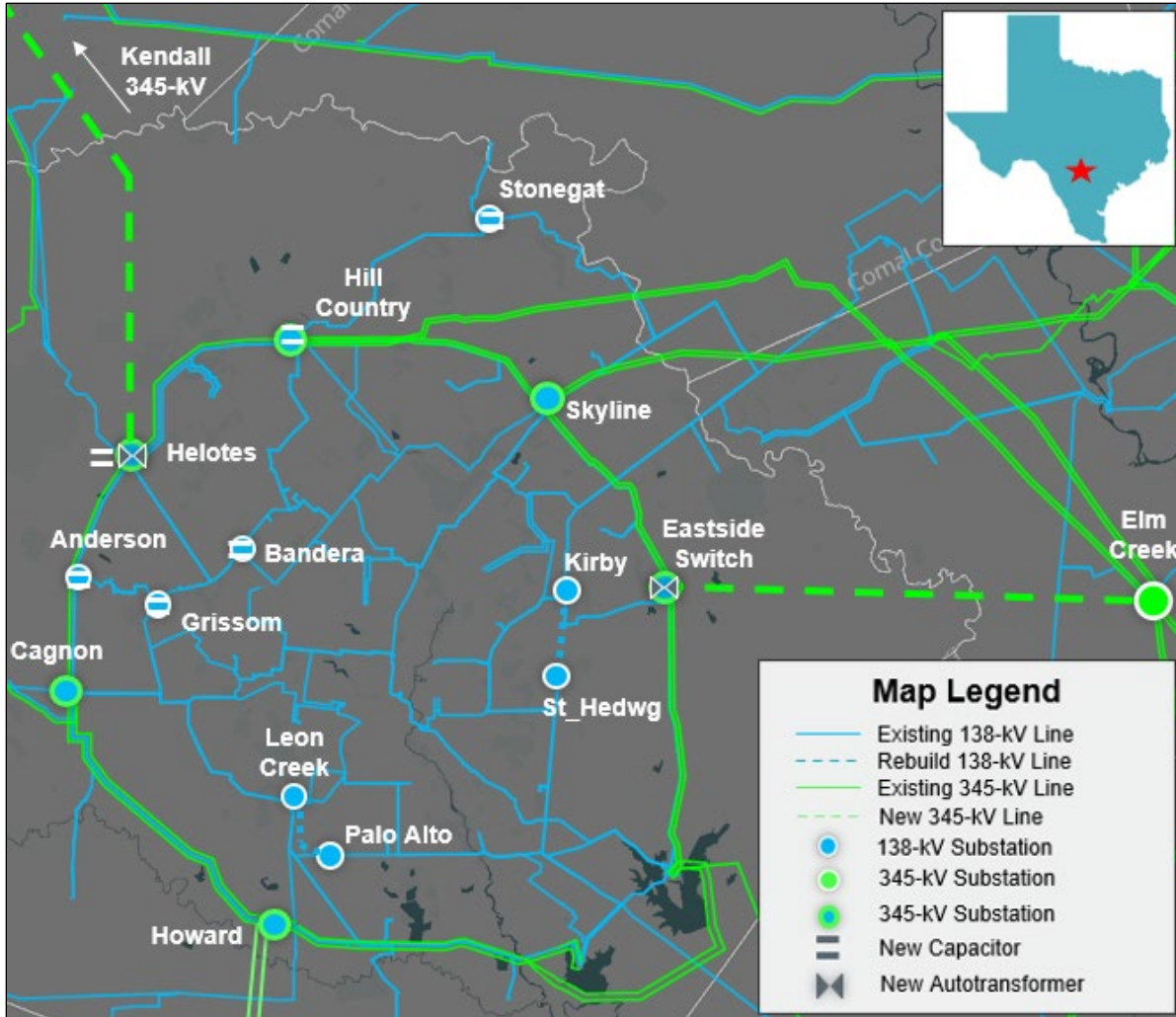


Figure 4.2: Map of Option 2

Option 3 consists of the following:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;
 - Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration;
 - Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA; and
 - Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;

- Construct a new Hill Country to Bergheim 345-kV transmission line on double-circuit structures with one circuit in place, with normal and emergency ratings of at least 1,980 MVA, which will require a new ROW, for approximately 14.28 miles;
- Rebuild the existing Castle to Dresden 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.79 miles;
- Rebuild the existing Cagnon to Potranco 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 5.87 miles;
- Rebuild the existing Leon Creek to Palo Alto 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.64 miles;
- Install a 50 MVA_r sized capacitor at the existing Anderson 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Bandera 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Grissom 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Helotes 138-kV substation;
- Install a 50 MVA_r sized capacitor at the existing Hill Country 138-kV substation;
and
- Install a 50 MVA_r sized capacitor at the existing Stonegate 138-kV substation.

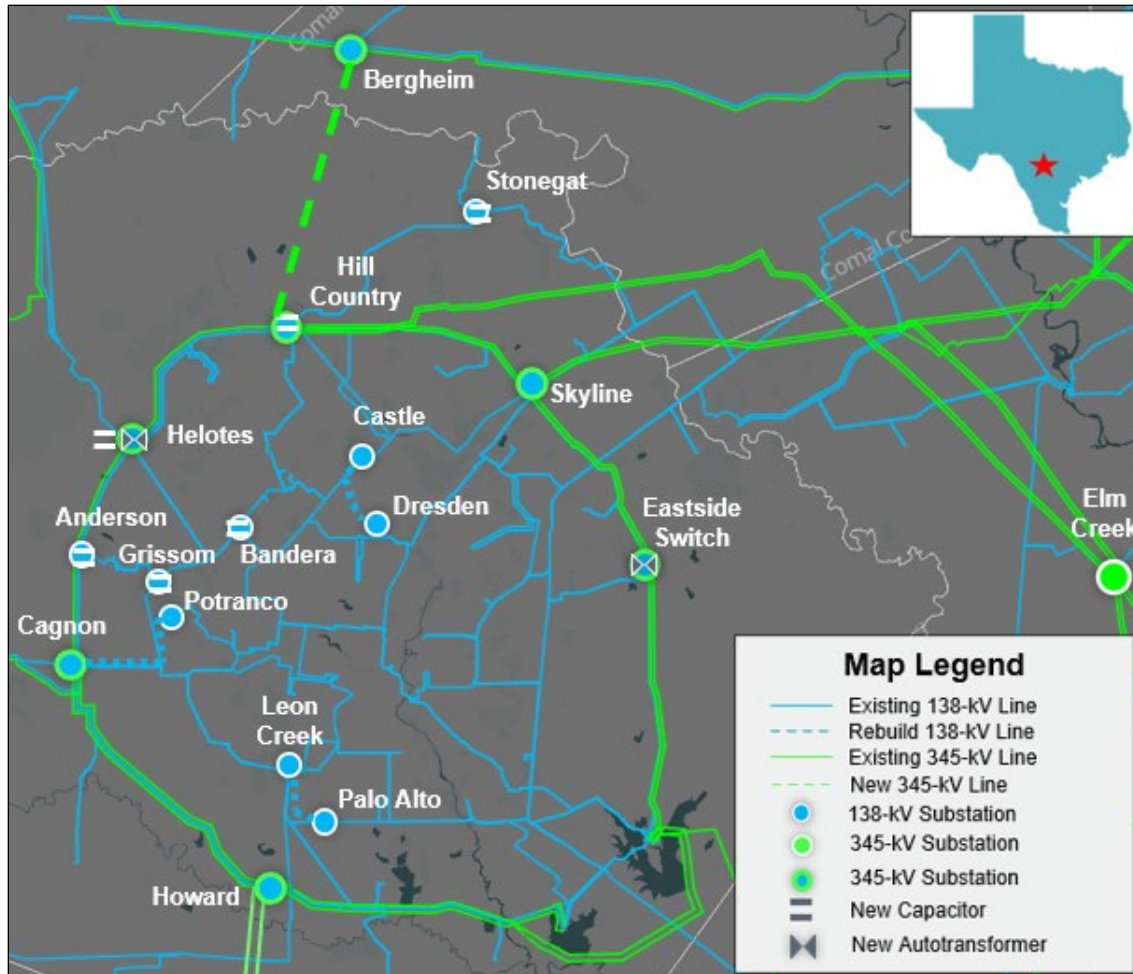


Figure 4.3: Map of Option 3

Option 3A consists of the following:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;
 - Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration;
 - Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA; and
 - Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;
- Construct a new Hill Country to Bergheim 345-kV transmission line on double-circuit structures with only one circuit in place, with normal and emergency ratings

of at least 1,980 MVA, which will require a new ROW, for approximately 14.28 miles;

- Rebuild the existing Castle to Dresden 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.79 miles;
- Rebuild the existing Cagnon to Potranco 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 5.87 miles;
- Rebuild the existing Leon Creek to Palo Alto 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.64 miles;
- Rebuild the existing Medinabs to 36th Street 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 8.57 miles;
- Rebuild the existing Cagnon to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 8.74 miles;
- Rebuild the existing Five_pts to Wstside 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.78 miles;
- Rebuild the existing Grissom to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.03 miles;
- Rebuild the existing Anderson to Helotes 138-kV transmission line with normal and emergency ratings of at least 600 MVA, for approximately 5.67 miles;
- Install a 50 MVAR sized capacitor at the existing Helotes 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Howard 138-kV substation;
- Install a 35 MVAR sized capacitor at the existing Ingram Road 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Legend Falls 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Panther Springs 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Tally_Rd 138-kV substation;
- Install a 35 MVAR sized capacitor at the existing Tezel Road 138-kV substation;
- Install a 300 MVAR STATCOM with GFM at the existing Grissom 138-kV substation; and

- Install a 300 MVAR STATCOM with GFM at the existing Martinez 138-kV substation.

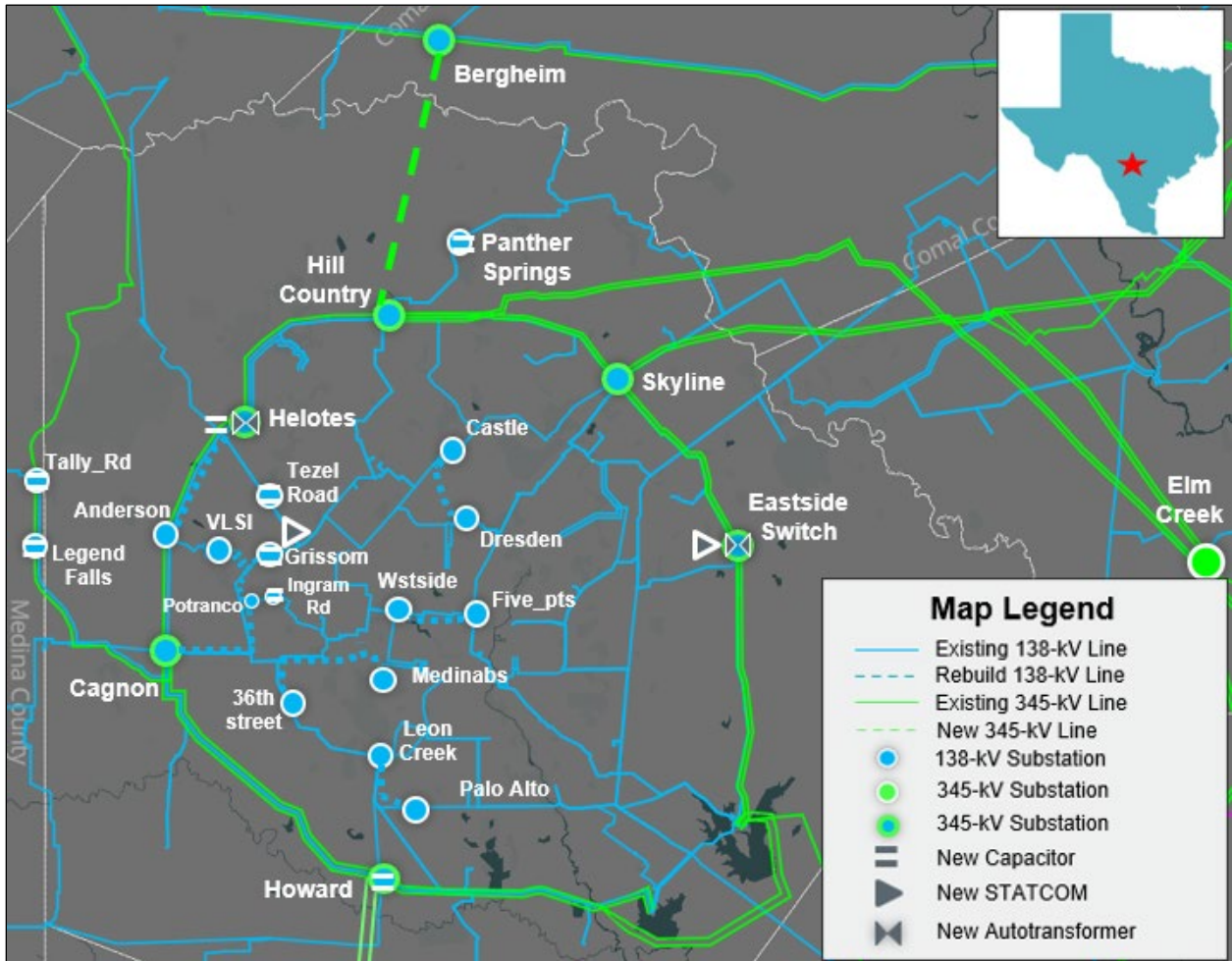


Figure 4.4: Map of Option 3A

5. Option Evaluations

ERCOT performed a reliability analysis, maintenance outage evaluation, and a long-term load-serving capability assessment to evaluate all project options and to identify any reliability impact of the options in the study area. This section details these studies and their results and compares each option’s results.

5.1. Results of Reliability Analysis

All four options were evaluated based on the contingencies described in the methodology section of the report. As shown in Table 5.1, Option 1 identified a reliability criteria (thermal overload) violations, but no reliability criteria violation were identified for Option 2, Option 3, and Option 3A.

Table 5.1: Results of Initial Reliability Assessment of All Four Options

Option	N-1		(X-1+N-1)		(G-1+N-1)		Unsolved Power Flow
	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation	
1	None	None	None	None	7	None	None
2	None	None	None	None	None	None	None
3	None	None	None	None	None	None	None
3A	None	None	None	None	None	None	None

This analysis indicated additional thermal overloads, voltage violations, and unsolved power flows in Bastrop, Caldwell, Comal, Guadalupe, Hays, and Travis counties which are outside of the study area and were not intended to be addressed by these options. The monitored violations for Option 3A that were not addressed by this project are listed in Table A.1.5, Table A.1.6, and Table A.1.7 in the Appendix A of this report, respectively.

5.2. Maintenance Outage Evaluation

Using the P1, P2.1, and P7 contingencies based on the review of the system topology of the area, ERCOT conducted an N-2 contingency analysis for each option to represent system element outage(s) under maintenance condition (N-1-1) in the area. Then, each N-2 violation was run as an N-1-1 contingency scenario, with system adjustments

between the contingencies. The transmission elements in the study area were monitored in the maintenance outage evaluation.

As shown in Table 5.2, the results of this maintenance outage assessment indicate Option 3A did not result in any reliability violations while Option 1, Option 2, and Option 3 did have reliability violations.

Table 5.2: Results of Maintenance Outage Evaluation for All Four Options

Option	Thermal Overloads	Voltage Violations	Unsolved Power Flow
1	18	None	None
2	5	None	None
3	5	None	None
3A	None	None	None

5.3. Long-Term Load-Serving Capability Analysis

ERCOT conducted long-term load-serving capability assessments of the four options to compare the relative performance.

The results show that all four options provided additional long-term load-serving capability with Option 3A providing the greatest capability and Option 2 providing the least. These results are shown in Table 5.3.

Table 5.3: Results of Long-Term Load-Serving Capability Assessment of All Four Options

Option	Incremental Load-Serving Capability (~MW)
1	37.7
2	8.7
3	167.7
3A	206.9

5.4. Cost Estimate and Feasibility Assessment

TSPs performed feasibility assessments and provided cost estimates for the four options. Table 5.4 summarizes the cost estimate, estimated mileage of CCN required, construction feasibility, and expected year of completion for the four options.

Table 5.4: Cost Estimates and Expected ISD for Four Options

Option	Cost Estimates (~\$M)	CCN Required (~miles)	Construction Feasible	Expected ISD (Year)
1	235.0 ¹²	No	No	2029
2	N/A	Yes (62.5)	No	N/A
3	N/A	Yes (14.3)	No	N/A
3A	477.7	Yes (14.3)	Yes	2031

Based on the TSPs' input, Options 1, Option 2, and Option 3 were deemed infeasible due to inadequate locations for proposed reactive devices.

¹² Updated cost estimate from the original estimate in the RPG submittal.

6. Comparison of Options

A comparison of the four options evaluated is summarized in Table 6.1.

Table 6.1: Comparison of All Four Options

	Option 1	Option 2	Option 3	Option 3A
Met ERCOT and NERC Reliability Criteria	No	No	No	Yes
Improves Long-Term Load-Serving Capability (~MW)	37.7	8.7	167.7	206.9
CCN Required (~miles)	No	Yes (62.5)	Yes (14.3)	Yes (14.3)
Construction Feasibility (Based on TSP assessment)	No	No	No	Yes
Capital Cost Estimates ¹³ (~\$M)	235.0 ¹⁴	N/A	N/A	477.7
Estimated ISD (Year)	2029	N/A	N/A	2031

ERCOT recommends Option 3A as the preferred option to address the reliability need in the study area based on the following considerations:

- Option 3A addresses the project need in the study area and meets ERCOT and NERC reliability criteria;
- Option 3A improves long-term load-serving capability; and
- Option 3A is feasible for construction.

¹³ The cost estimates were provided by the TSPs.

¹⁴ Updated cost estimate from the original estimate in the RPG submittal.

7. Additional Analysis and Assessment

ERCOT’s preferred Option 3A, with a cost estimate of approximately \$477.7 million, is categorized as a Tier 1 project pursuant to ERCOT Protocol 3.11.4.3(1)(a). ERCOT performed a generation sensitivity analysis and considered load scaling impacts to identify the preferred option’s performance, as required under Planning Guide Section 3.1.3(4). Additionally, ERCOT performed a Subsynchronous Oscillations (SSO) Assessment pursuant to Protocol Section 3.22.1.3(2), a dynamic stability assessment, and a congestion analysis.

7.1. 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 February 2026 GIS¹⁵ report, five (5) units were found within the study area that could have an impact on the identified reliability issues. These units, listed in Table 7.1, were added to the recommended option case following the 2024 RTP Methodology. ERCOT determined that the addition of these generators does not impact the recommended Option 3A.

Table 7.1: List of Units That Could Have an Impact On the Identified Reliability Issues

GINR	Unit Name	Fuel Type	Max Capacity (~MW)	County
23INR0088	Nockenut Springs Solar 1	Solar	203.2	Guadalupe
23INR0467	Lavender Storage Project	BESS	231.9	Bexar
24INR0007	Nockenut Springs Solar 2	Solar	203.2	Guadalupe
24INR0108	Louisa Energy Storage	BESS	102.8	Bexar
26INR0330	Alamo City BESS	BESS	128.2	Bexar

7.2. Load Scaling Sensitivity Analysis

ERCOT Planning Guide Section 3.1.3(4)(b) requires an evaluation of the potential impact of load scaling on the criteria violations seen in the 2024 RTP study. Before 2024, ERCOT’s RTP adopted the methodology of developing four sets of summer peak cases

¹⁵ GIS Report: <https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER>

with each case representing one study region for each study year. For each summer peak case, the loads outside of the study region may be scaled down from the respective non-coincident summer peak levels to maintain a certain reserve requirement. This methodology may cause potential impact of load scaling on the criteria violations. Starting 2024, ERCOT's RTP adopted a new methodology of having one summer peak case for each study year with non-coincident peaks for each of the Weather Zones, which would eliminate the load scaling impact. As such, load scaling sensitivity analyses are no longer needed.

7.3. Subsynchronous Oscillations (SSO) Assessment

Pursuant to Protocol Section 3.22.1.3(2), ERCOT conducted an SSO screening for the recommended Option 3A and found no adverse SSO impacts to the existing and planned generation resources in the study area.

7.4. Dynamic Stability Analysis

A dynamic stability analysis examines a power system's behavior before, during, and after a disturbance such as a fault on a transmission line. It involves assessing the system's ability to maintain stability, withstand the disturbance, and return to a steady-state condition. The analysis ensures that the system can handle faults without losing synchronism or experiencing unacceptable oscillations, ensuring reliable and continuous operation.

As detailed in Section 2.6.2 of this report, ERCOT performed a dynamic stability analysis focused exclusively on the P1, P2, P4, P5, P7, and ERCOT2 contingencies in the study area. The dynamic stability analysis was performed for the recommended Option 3A.

Additionally, ERCOT performed a Fault-Induced Delayed Voltage Recovery (FIDVR) analysis using critical Single-Line-to-Ground (SLG) fault P4 and P7 events provided by CPS to confirm that no FIDVR issue exists due to stalling residential air conditioning motor loads within CPS's service-area.

The results demonstrated that there were no planning criteria violations pertaining to transient stability as specified in the criteria described in Section 2.6.2 of this report.

Example plots demonstrating that performance criteria are met can be found in Appendix A.2.

7.5. Congestion Analysis

ERCOT conducted a congestion analysis to identify any potential impact on system congestion related to the addition of the recommended project, Option 3A, using the 2024 RTP 2029 economic study case.

The results of the congestion analysis indicated no additional congestion in the area due to the addition of Option 3A's recommended transmission upgrades.

8. Conclusion

ERCOT evaluated four transmission upgrade options to resolve the thermal overloads, voltage violations, and unsolved power flows in the study area. Based on the results of the EIR, ERCOT recommends Option 3A as the preferred solution because it addresses all project needs, meets ERCOT and NERC reliability criteria, improves long-term load-serving capability, and is feasible for construction.

As noted in the RPG submittal from CPS, the proposed STATCOM with GFM is expected to provide dynamic reactive power support in areas where generation retirements have occurred or are anticipated. As these retirements reduce the availability of dynamic reactive power support, STATCOMs with GFM will be beneficial in maintaining overall system reliability. In addition, the combined project is expected to support Large Electronic Load-related load growth by enhancing voltage performance and improving system resilience across various system conditions.

Option 3A consists of the following upgrades:

- Convert the existing Helotes 138-kV substation to a new 345/138-kV switching substation;
 - Construct a new 345-kV Helotes switching yard using a breaker-and-a-half configuration;
 - Install two new 345/138-kV autotransformers at the new Helotes 345/138-kV switching substation, with normal and emergency ratings of at least 600 MVA; and
 - Loop in the existing Hill Country to Cagnon 345-kV transmission line into the new Helotes 345-kV substation;
- Install a new 345/138-kV autotransformer at the existing Eastside 345/138-kV substation, with normal and emergency ratings of at least 600 MVA;
- Construct a new Hill Country to Bergheim 345-kV transmission line on double-circuit structures with one circuit in place, with normal and emergency ratings of at least 1,980 MVA, which will require a new ROW, for approximately 14.28 miles;
- Rebuild the existing Castle to Dresden 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.79 miles;
 - The existing infrastructure is approximately 55 years old with a current normal and emergency ratings of 206 MVA;

- Rebuild the existing Cagnon to Potranco 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 5.87 miles;
 - The existing infrastructure is approximately 54 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Leon Creek to Palo Alto 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.64 miles;
 - The existing infrastructure is approximately 30 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Medinabs to 36th Street 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 8.57 miles;
 - The existing infrastructure is approximately 52 years old with a current normal and emergency ratings of 213 MVA;
- Rebuild the existing Cagnon to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 8.74 miles;
 - The existing infrastructure is approximately 58 years old with a current normal and emergency ratings of 314 MVA;
- Rebuild the existing Five_pts to Wstside 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.78 miles;
 - The existing infrastructure is approximately 9 years old with a current normal and emergency ratings of 287 MVA;
- Rebuild the existing Grissom to VLSI 138-kV transmission line with normal and emergency ratings of at least 478 MVA, for approximately 3.03 miles;
 - The existing infrastructure is approximately 42 years old with a current normal and emergency ratings of 293 MVA;
- Rebuild the existing Anderson to Helotes 138-kV transmission line with normal and emergency ratings of at least 600 MVA, for approximately 5.67 miles;
 - The existing infrastructure is approximately 58 years old with a current normal and emergency ratings of 478 MVA;
- Install a 50 MVAR sized capacitor at the existing Helotes 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Howard 138-kV substation;
- Install a 35 MVAR sized capacitor at the existing Ingram Road 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Legend Falls 138-kV substation;
- Install a 50 MVAR sized capacitor at the existing Panther Springs 138-kV substation;
- Install a 25 MVAR sized capacitor at the existing Tally_Rd 138-kV substation;
- Install a 35 MVAR sized capacitor at the existing Tezel Road 138-kV substation;

- Install a 300 MVAR STATCOM with GFM at the existing Grissom 138-kV substation; and
- Install a 300 MVAR STATCOM with GFM at the existing Martinez 138-kV substation.

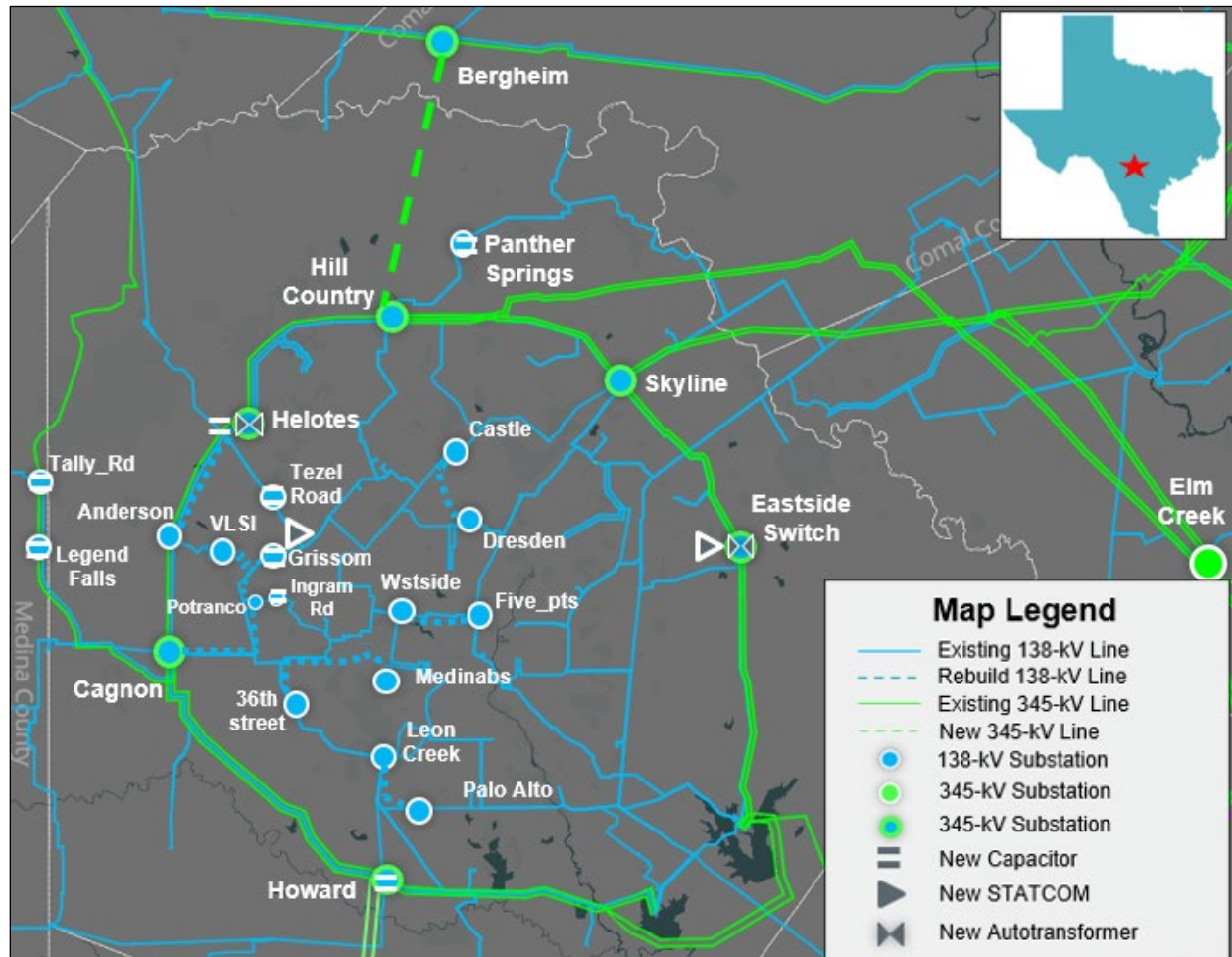


Figure 10.1: Map of Option 1

The cost estimate for this Tier 1 project is approximately \$477.7 million. A CCN application will be required for the construction of the new 345-kV line from the existing Hill County substation to the existing Bergheim substation due to approximately 14.28 miles of new ROW. A portion of this combined project will be owned by CPS, and the other portion will be owned by the LCRA TSC. The expected ISD for CPS' portion of this combined project is December 2029, and the expected ISD of LCRA TSC's portion of this combined project is October 2031.

9. Appendix

A.1:

Table A.1.1: List of Transmission Project added to the Economic Base Case

TPIT No	Project Name	Tier	Project ISD	County
88912	GVEC_Olmos to Wilson 138 kV TL, T297	4	Dec-26	Guadalupe

Table A.1.2: List of Generation Added to the Economic Base Case Based on June 2025 GIS Report

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
20INR0162	Diamondback Solar	WND	12/31/2027	203.8	Starr
21INR0359	Hickerson Solar	SOL	11/21/2025	311.1	Bosque
22INR0220	Lamkin Solar	SOL	08/08/2027	101.5	Comanche
22INR0239	Rockefeller Storage	BESS	06/01/2027	206.8	Schleicher
22INR0437	TORMES SOLAR	SOL	03/31/2027	382.1	Navarro
22INR0457	Anson BAT	BESS	08/01/2026	150.6	Jones
22INR0605	Camino Santiago Solar	SOL	02/18/2027	196.3	Milam
23INR0078	Shaw Solar	SOL	04/29/2026	124.7	Bandera
23INR0181	Starling Storage	BESS	05/15/2027	63.6	Gonzales
23INR0225	MRG GOODY SOLAR	SOL	05/02/2026	170.8	Lamar
23INR0538	Roadrunner Crossing BESS SLF	BESS	12/31/2025	150.4	Eastland
24INR0181	Bynum Solar Project	SOL	12/01/2025	56.0	Coryell
24INR0188	Tehuacana Creek Solar SLF	SOL	03/10/2027	505.5	Navarro
24INR0189	Tehuacana Creek BESS SLF	BESS	03/10/2027	419.0	Navarro
24INR0305	MRG Goody Storage	BESS	05/02/2026	52.3	Lamar
24INR0355	Anatole Renewable Energy Storage	BESS	03/31/2027	207.8	Henderson
24INR0364	Pitts Dudik II	SOL	02/04/2026	30.2	Hill
24INR0386	Black & Gold Energy Storage	BESS	06/30/2027	254.6	Menard
24INR0453	Longfellow BESS I	BESS	01/31/2026	55.0	Pecos
24INR0455	Longfellow BESS II	BESS	01/31/2026	105.8	Pecos
24INR0493	Crowned Heron BESS 2	BESS	03/31/2026	154.2	Fort Bend

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
24INR0528	Blanquilla BESS	BESS	05/15/2026	200.8	Nueces
24INR0533	Padua Grid BESS Unit 2	BESS	03/15/2026	150.9	Bexar
24INR0584	Houston IV BESS	BESS	06/03/2026	164.6	Harris
25INR0018	Yellow Cat Wind	WND	04/01/2027	262.0	Navarro
25INR0046	Blue Skies BESS	BESS	12/31/2027	306.3	Hill
25INR0199	Bonham Solar 1	SOL	08/31/2026	138.4	Limestone
25INR0229	OCI Cobb Creek Solar	SOL	12/01/2026	203.1	Hill
25INR0233	OCI Cobb Creek ESS	BESS	12/01/2026	201.6	Hill
25INR0391	Purple Sage BESS 1	BESS	05/30/2027	156.0	Collin
25INR0392	Purple Sage BESS 2	BESS	05/30/2027	156.0	Collin
26INR0034	Bracero Pecan Storage	BESS	04/01/2027	232.0	Reeves
26INR0296	Sherbino II BESS SLF	BESS	02/08/2026	77.4	Pecos
26INR0543	Three Canes Solar SLF	SOL	03/10/2027	333.0	Navarro
28INR0024	Padua Grid BESS Unit 3	BESS	05/15/2026	201.4	Bexar

Table A.1.3: Voltage Violations Observed in the Study Area

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P1: N-1	SCENIC_LOOP (5363)	138	0.90	0.83
P6-2: (X-1+N-1)	36TH_ST (5427)	138	0.90	0.84
P6-2: (X-1+N-1)	ALAMO_CM (5001)	138	0.90	0.82
P6-2: (X-1+N-1)	ALAMO1_8 (5007)	138	0.90	0.85
P6-2: (X-1+N-1)	ALAMOTP (5000)	138	0.90	0.82
P6-2: (X-1+N-1)	AMD_SA (5002)	138	0.90	0.82
P6-2: (X-1+N-1)	ANDERSON (5003)	138	0.90	0.82
P6-2: (X-1+N-1)	AUSTIN1 (5005)	138	0.90	0.82
P6-2: (X-1+N-1)	BALL_PRK (5011)	138	0.90	0.82
P6-2: (X-1+N-1)	BANDERA (5020)	138	0.90	0.81
P6-2: (X-1+N-1)	BECK_RD (5035)	138	0.90	0.84
P6-2: (X-1+N-1)	BLOSSOM (5022)	138	0.90	0.82
P6-2: (X-1+N-1)	BRAUNIG_E (5030)	138	0.90	0.85

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P6-2: (X-1+N-1)	BRAUNIG_W (5025)	138	0.90	0.85
P6-2: (X-1+N-1)	BROADVIEW (5040)	138	0.90	0.82
P6-2: (X-1+N-1)	BROOKS (5045)	138	0.90	0.84
P6-2: (X-1+N-1)	BUCKEYE (5050)	138	0.90	0.81
P6-2: (X-1+N-1)	CAGNON_5 (5056)	345	0.90	0.84
P6-2: (X-1+N-1)	CAGNON1_8 (5055)	138	0.90	0.83
P6-2: (X-1+N-1)	CAGNON2_8 (5054)	138	0.90	0.83
P6-2: (X-1+N-1)	CAGNON3_8 (5053)	138	0.90	0.83
P6-2: (X-1+N-1)	CAPITOL (5075)	138	0.90	0.82
P6-2: (X-1+N-1)	CASTLE (5080)	138	0.90	0.81
P6-2: (X-1+N-1)	CHAVANEA (5085)	138	0.90	0.84
P6-2: (X-1+N-1)	CHULIE (5090)	138	0.90	0.81
P6-2: (X-1+N-1)	CIBOLOCR (5093)	138	0.90	0.81
P6-2: (X-1+N-1)	COLISEUM (5095)	138	0.90	0.82
P6-2: (X-1+N-1)	COMAL_ST (5096)	138	0.90	0.82
P6-2: (X-1+N-1)	CROSSROADS (5102)	138	0.90	0.83
P6-2: (X-1+N-1)	DEZAVALA (5125)	138	0.90	0.81
P6-2: (X-1+N-1)	DONOP RD (5128)	138	0.90	0.84
P6-2: (X-1+N-1)	DRESDEN (5130)	138	0.90	0.81
P6-2: (X-1+N-1)	ELMENDRF (5135)	138	0.90	0.85
P6-2: (X-1+N-1)	ELPATR_POI (888871)	138	0.90	0.88
P6-2: (X-1+N-1)	ENCINO (5140)	138	0.90	0.81
P6-2: (X-1+N-1)	EXETER (5143)	138	0.90	0.82
P6-2: (X-1+N-1)	FAIRRA (5470)	138	0.90	0.90
P6-2: (X-1+N-1)	FERDINAN_B1 (171071)	138	0.90	0.86
P6-2: (X-1+N-1)	FERN (5147)	138	0.90	0.82
P6-2: (X-1+N-1)	FIVE_PTS (5150)	138	0.90	0.82
P6-2: (X-1+N-1)	FORT_SAM (5160)	138	0.90	0.82
P6-2: (X-1+N-1)	FRATT (5165)	138	0.90	0.82
P6-2: (X-1+N-1)	FRED_RD (5170)	138	0.90	0.82
P6-2: (X-1+N-1)	GRANDVIEW (5175)	138	0.90	0.82
P6-2: (X-1+N-1)	GRISSOM (5185)	138	0.90	0.81
P6-2: (X-1+N-1)	HAMWOLF (5187)	138	0.90	0.81
P6-2: (X-1+N-1)	HARLANDA (5190)	138	0.90	0.85
P6-2: (X-1+N-1)	HARMONY (5195)	138	0.90	0.82
P6-2: (X-1+N-1)	HELOTES (5200)	138	0.90	0.82
P6-2: (X-1+N-1)	HIGHLAND_HIL (5205)	138	0.90	0.83
P6-2: (X-1+N-1)	HILLCTY_5 (5211)	345	0.90	0.83
P6-2: (X-1+N-1)	HILLCTY1_8 (5210)	138	0.90	0.81
P6-2: (X-1+N-1)	HILLCTY3_8 (5209)	138	0.90	0.82

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P6-2: (X-1+N-1)	HILLCTY4_8 (5208)	138	0.90	0.82
P6-2: (X-1+N-1)	HOLBROOK (5218)	138	0.90	0.82
P6-2: (X-1+N-1)	HOLLYWD (5220)	138	0.90	0.82
P6-2: (X-1+N-1)	HOTWELLS (5227)	138	0.90	0.82
P6-2: (X-1+N-1)	HOWARD (5230)	138	0.90	0.85
P6-2: (X-1+N-1)	HOWARD_5 (5231)	345	0.90	0.86
P6-2: (X-1+N-1)	HUNT_LN (5234)	138	0.90	0.83
P6-2: (X-1+N-1)	INGRAM RD (5241)	138	0.90	0.83
P6-2: (X-1+N-1)	JT_DEELY (5110)	138	0.90	0.83
P6-2: (X-1+N-1)	KIRBY (5250)	138	0.90	0.82
P6-2: (X-1+N-1)	LA HTS_A (5285)	138	0.90	0.81
P6-2: (X-1+N-1)	LAREDO1 (5255)	138	0.90	0.82
P6-2: (X-1+N-1)	LASIERRA (5257)	138	0.90	0.81
P6-2: (X-1+N-1)	LEON_CRK (5260)	138	0.90	0.86
P6-2: (X-1+N-1)	LYTLE (5290)	138	0.90	0.85
P6-2: (X-1+N-1)	MARTINEZ (5294)	138	0.90	0.83
P6-2: (X-1+N-1)	MAUERMAN (5297)	138	0.90	0.85
P6-2: (X-1+N-1)	MED_CTR (5300)	138	0.90	0.81
P6-2: (X-1+N-1)	MEDINABS (5305)	138	0.90	0.84
P6-2: (X-1+N-1)	MERIDA (5310)	138	0.90	0.84
P6-2: (X-1+N-1)	MID_TOWN (5311)	138	0.90	0.82
P6-2: (X-1+N-1)	NACDCHES (5315)	138	0.90	0.82
P6-2: (X-1+N-1)	NAVISTAR (5317)	138	0.90	0.85
P6-2: (X-1+N-1)	OCI_ALM_HIGH (170382)	138	0.90	0.85
P6-2: (X-1+N-1)	OLMOS (5325)	138	0.90	0.82
P6-2: (X-1+N-1)	OMICRON (5326)	138	0.90	0.83
P6-2: (X-1+N-1)	PADUA_B1 (170721)	138	0.90	0.85
P6-2: (X-1+N-1)	PADUA_B2 (170722)	138	0.90	0.85
P6-2: (X-1+N-1)	PADUA_B3 (170723)	138	0.90	0.85
P6-2: (X-1+N-1)	PALO_ALT (5330)	138	0.90	0.85
P6-2: (X-1+N-1)	PANTHER (5331)	138	0.90	0.81
P6-2: (X-1+N-1)	PARSONS (5332)	138	0.90	0.82
P6-2: (X-1+N-1)	PEARSAL (5335)	138	0.90	0.86
P6-2: (X-1+N-1)	PINN_RD (5345)	138	0.90	0.83
P6-2: (X-1+N-1)	POTRANCO (5346)	138	0.90	0.83
P6-2: (X-1+N-1)	QUINTANA (5350)	138	0.90	0.85
P6-2: (X-1+N-1)	RAFTER (5355)	138	0.90	0.84
P6-2: (X-1+N-1)	RANCHTWN (5358)	138	0.90	0.83
P6-2: (X-1+N-1)	RANDOLPH (5360)	138	0.90	0.82
P6-2: (X-1+N-1)	SHPRD_RD (5378)	138	0.90	0.84

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P6-2: (X-1+N-1)	SKYLIN1_8 (5368)	138	0.90	0.82
P6-2: (X-1+N-1)	SKYLIN3_8 (5369)	138	0.90	0.82
P6-2: (X-1+N-1)	SKYLIN4_8 (5370)	138	0.90	0.82
P6-2: (X-1+N-1)	SKYLINE_5 (5371)	345	0.90	0.83
P6-2: (X-1+N-1)	SODG_5035 (705035)	138	0.90	0.84
P6-2: (X-1+N-1)	SODG_5045 (705045)	138	0.90	0.84
P6-2: (X-1+N-1)	SODG_5135 (705135)	138	0.90	0.85
P6-2: (X-1+N-1)	SODG_5227 (705227)	138	0.90	0.82
P6-2: (X-1+N-1)	SODG_5234 (705234)	138	0.90	0.83
P6-2: (X-1+N-1)	SODG_5305 (705305)	138	0.90	0.84
P6-2: (X-1+N-1)	SODG_5331 (705331)	138	0.90	0.81
P6-2: (X-1+N-1)	SODG_5335 (705335)	138	0.90	0.86
P6-2: (X-1+N-1)	SODG_5370 (705370)	138	0.90	0.82
P6-2: (X-1+N-1)	SODG_5385 (705385)	138	0.90	0.85
P6-2: (X-1+N-1)	SODG_5390 (705390)	138	0.90	0.85
P6-2: (X-1+N-1)	SODG_5410 (705410)	138	0.90	0.82
P6-2: (X-1+N-1)	SODG_5430 (705430)	138	0.90	0.83
P6-2: (X-1+N-1)	SODG_5465 (705465)	138	0.90	0.86
P6-2: (X-1+N-1)	SODG_5485 (705485)	138	0.90	0.82
P6-2: (X-1+N-1)	SOMERSET (5390)	138	0.90	0.85
P6-2: (X-1+N-1)	SOMMERS (5395)	138	0.90	0.85
P6-2: (X-1+N-1)	SOUTHSAN (5385)	138	0.90	0.85
P6-2: (X-1+N-1)	SOUTHTON (5394)	138	0.90	0.84
P6-2: (X-1+N-1)	SPRUCE (5400)	345	0.90	0.86
P6-2: (X-1+N-1)	ST_HEDWG (5410)	138	0.90	0.82
P6-2: (X-1+N-1)	STONEGAT (5415)	138	0.90	0.81
P6-2: (X-1+N-1)	STREICH (5417)	138	0.90	0.84
P6-2: (X-1+N-1)	SWRI (5419)	138	0.90	0.82
P6-2: (X-1+N-1)	TCC (5423)	138	0.90	0.82
P6-2: (X-1+N-1)	TENTH_ST (5420)	138	0.90	0.82
P6-2: (X-1+N-1)	TEZEL_RD (5421)	138	0.90	0.81
P6-2: (X-1+N-1)	TOYOTA (5428)	138	0.90	0.85
P6-2: (X-1+N-1)	TRUMBO (5429)	138	0.90	0.88
P6-2: (X-1+N-1)	TUTTLE (5435)	138	0.90	0.82
P6-2: (X-1+N-1)	TX_RSRCH (5430)	138	0.90	0.83
P6-2: (X-1+N-1)	USAA_A (5451)	138	0.90	0.81
P6-2: (X-1+N-1)	USAA_ATP (5450)	138	0.90	0.81
P6-2: (X-1+N-1)	USAA_B (5453)	138	0.90	0.81
P6-2: (X-1+N-1)	USAA_BTP (5452)	138	0.90	0.81
P6-2: (X-1+N-1)	USAA2 (5456)	138	0.90	0.81

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P6-2: (X-1+N-1)	USAA2TP (5455)	138	0.90	0.81
P6-2: (X-1+N-1)	UTSA (5460)	138	0.90	0.81
P6-2: (X-1+N-1)	UTSA_ATP (5461)	138	0.90	0.81
P6-2: (X-1+N-1)	UTSA_BTP (5462)	138	0.90	0.81
P6-2: (X-1+N-1)	VALLEY (5465)	138	0.90	0.86
P6-2: (X-1+N-1)	VERDE CIRCLE (5466)	138	0.90	0.81
P6-2: (X-1+N-1)	VLSI (5467)	138	0.90	0.81
P6-2: (X-1+N-1)	VON_ROSE (5475)	345	0.90	0.87
P6-2: (X-1+N-1)	WALZEM (5485)	138	0.90	0.82
P6-2: (X-1+N-1)	WISEMAN (5487)	138	0.90	0.82
P6-2: (X-1+N-1)	WOH (5488)	138	0.90	0.81
P6-2: (X-1+N-1)	WTSIDE (5490)	138	0.90	0.83

Table A.1.4: Unsolved Power Flows Observed in the Study Area Under NERC P1(N-1), P7(N-1), P3(G-1+N-1), and/or P6-2(X-1+N-1) Conditions

No	Contingency
1	(REDACTED)
2	(REDACTED)
3	(REDACTED)
4	(REDACTED)
5	(REDACTED)
6	(REDACTED)
7	(REDACTED)
8	(REDACTED)
9	(REDACTED)
10	(REDACTED)
11	(REDACTED)
12	(REDACTED)
13	(REDACTED)
14	(REDACTED)
15	(REDACTED)
16	(REDACTED)
17	(REDACTED)
18	(REDACTED)
19	(REDACTED)
20	(REDACTED)
21	(REDACTED)
22	(REDACTED)
23	(REDACTED)
24	(REDACTED)

No	Contingency
25	(REDACTED)
26	(REDACTED)
27	(REDACTED)
28	(REDACTED)
29	(REDACTED)
30	(REDACTED)
31	(REDACTED)
32	(REDACTED)
33	(REDACTED)
34	(REDACTED)
35	(REDACTED)
36	(REDACTED)
37	(REDACTED)
38	(REDACTED)
39	(REDACTED)
40	(REDACTED)

Table A.1.5: Thermal Overloads Observed and Not Addressed Outside the Study Area

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~miles)	Max Loading (%)
P0: N-0	CACHENA (5068) -> ELMCREEK (5133) CKT 2	345	18.0	120.9
P0: N-0	CISTERN (9043) -> LYTTON5 (9074) CKT 1	345	25.0	120
P0: N-0	L_AUSTRO5_1Y (7040) -> L_MISTY_5_1Y (7051) CKT 1	345	28.7	105.1
P0: N-0	L_HENNE_8_1Y (7174) -> L_ZORN_8_1Y (7180) CKT 1	138	6.5	168.5
P0: N-0	L_MISTY_5_1Y (7051) -> LYTTON5 (9074) CKT 1	345	7.9	205.6
P0: N-0	L_ZORN_5_1Y (7042) -> L_MISTY_5_1Y (7051) CKT 1	345	15.2	139.7
P0: N-0	L_ZORN_5_1Y (7042) -> L_MISTY_5_1Y (7051) CKT 2	345	15.2	139.7
P3: (G-1+N-1)	AUSTROP8 (9328) -> L_SETTLE8_1Y (7327) CKT 1	138	7.8	102.5

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~miles)	Max Loading (%)
P3: (G-1+N-1)	CISTERN (9043) -> HOLMAN (9073) CKT 1	345	25.5	103.6
P3: (G-1+N-1)	HOLMAN (9073) -> CISTERN (9043) CKT 1	345	25.5	134
P3: (G-1+N-1)	L_BASTWE8_1Y (7555) -> L_BLUEBO8_1Y (7556) CKT 1	138	6.1	110.3
P3: (G-1+N-1)	L_BLUEBO8_1Y (7556) -> L_WYLDWO8_1Y (7210) CKT 1	138	2.4	171.9
P3: (G-1+N-1)	L_COMAL_8_1Y (7176) -> L_HUECSP8_1Y (7179) CKT 1	138	2.0	137.6
P3: (G-1+N-1)	L_CROSSW8_1Y (7503) -> L_GOFORT8_1Y (7501) CKT 2	138	6.7	101.5
P3: (G-1+N-1)	L_FPPYD15_1Y (7056) -> LOSTPINES (9041) CKT 1	345	39.1	113
P3: (G-1+N-1)	L_HUECSP8_1Y (7179) -> L_HENNE_8_1Y (7174) CKT 1	138	5.5	134
P3: (G-1+N-1)	L_TURNER8_1Y (7500) -> L_CROSSW8_1Y (7503) CKT 1	138	3.7	110.3
P3: (G-1+N-1)	L_WYLDWO8_1Y (7210) -> L_WOLFLA8_1Y (7212) CKT 1	138	5.8	165.6
P7: N-1	LOSTPINES (9041) -> L_AUSTRO5_1Y (7040) CKT 1	345	17.6	102.4
P7: N-1	WINCHES (9042) -> LOSTPINES (9041) CKT 1	345	20.5	101.1

Table A.1.6: Voltage Violations Observed and Not Addressed Outside of the Study Area

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P0: N-0	HAY_HAYSENG5 (170195)	345	0.95	0.95
P0: N-0	HAY_HAYSENG6 (170196)	345	0.95	0.95
P0: N-0	HAY_HAYSENG7 (170197)	345	0.95	0.95
P0: N-0	HAY_HAYSENG8 (170198)	345	0.95	0.95
P0: N-0	L_HAYSEN5_1Y (7043)	345	0.95	0.95
P1: N-1	L_NASHCR9_1Y (7596)	69	0.92	0.91
P3: (G-1+N-1)	BA138_CAP (9001)	138	0.95	0.94
P3: (G-1+N-1)	BARTON (9158)	138	0.95	0.94
P3: (G-1+N-1)	BIG_STAR_5 (170604)	345	0.95	0.95
P3: (G-1+N-1)	BLUFFSPG (9262)	138	0.95	0.93
P3: (G-1+N-1)	BRODIE (9169)	138	0.95	0.93
P3: (G-1+N-1)	BURLSN_MB1 (9120)	138	0.95	0.94
P3: (G-1+N-1)	BURLSN_MB2 (9121)	138	0.95	0.94
P3: (G-1+N-1)	CARSON (9175)	138	0.95	0.94
P3: (G-1+N-1)	CF138_CAP (9005)	138	0.95	0.94
P3: (G-1+N-1)	CISTERN (9043)	345	0.98	0.95
P3: (G-1+N-1)	COMMONFD (9183)	138	0.95	0.94
P3: (G-1+N-1)	EASTON PARK (9143)	138	0.95	0.93
P3: (G-1+N-1)	ELROY_LD1 (9198)	138	0.95	0.82
P3: (G-1+N-1)	GILLE138 (9054)	138	0.95	0.94
P3: (G-1+N-1)	HICROS_DB1 (9147)	138	0.95	0.94
P3: (G-1+N-1)	HICROS_MB1 (9148)	138	0.95	0.94
P3: (G-1+N-1)	L_BASTCI8_2Y (7319)	138	0.92	0.91
P3: (G-1+N-1)	L_BASTWE8_1Y (7555)	138	0.92	0.87
P3: (G-1+N-1)	L_BLUEBO8_1Y (7556)	138	0.92	0.85
P3: (G-1+N-1)	L_CEDAHI8_1Y (7331)	138	0.92	0.91
P3: (G-1+N-1)	L_COLTON8_1Y (7208)	138	0.92	0.81
P3: (G-1+N-1)	L_ELROY_8_1Y (7209)	138	0.92	0.81
P3: (G-1+N-1)	L_HARRBR8_1Y (7333)	138	0.92	0.91
P3: (G-1+N-1)	L_HENNE_8_1Y (7174)	138	0.92	0.89
P3: (G-1+N-1)	L_MANOR_8_1Y (7330)	138	0.92	0.91
P3: (G-1+N-1)	L_SHADGL8_1Y (7323)	138	0.92	0.91
P3: (G-1+N-1)	L_SWIFTE8_1Y (7326)	138	0.92	0.91
P3: (G-1+N-1)	L_TEXIND8_1Y (7454)	138	0.92	0.88
P3: (G-1+N-1)	L_WOLFLA8_1Y (7212)	138	0.92	0.8
P3: (G-1+N-1)	L_WYLDWO8_1Y (7210)	138	0.92	0.84
P3: (G-1+N-1)	LAKEWY_LD1 (9235)	138	0.95	0.94
P3: (G-1+N-1)	LAKEWY_LD2 (9236)	138	0.95	0.94

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P3: (G-1+N-1)	LYTTON5 (9074)	345	0.95	0.92
P3: (G-1+N-1)	LYTTON8 (9075)	138	0.95	0.93
P3: (G-1+N-1)	OAKHILL (9247)	138	0.95	0.94
P3: (G-1+N-1)	OH138_CAP (9012)	138	0.95	0.94
P3: (G-1+N-1)	PATTON_MB1 (9253)	138	0.95	0.94
P3: (G-1+N-1)	PATTON_MB2 (9254)	138	0.95	0.94
P3: (G-1+N-1)	PILOTKNOB (9259)	138	0.95	0.94
P3: (G-1+N-1)	PK138_CAP (9015)	138	0.95	0.94
P3: (G-1+N-1)	SALEMWLK (9263)	138	0.95	0.94
P3: (G-1+N-1)	SLAUGHTR (9267)	138	0.95	0.93
P3: (G-1+N-1)	SODG_7208 (707208)	138	0.9	0.81
P3: (G-1+N-1)	SPRNKL_MB1 (9272)	138	0.95	0.93
P3: (G-1+N-1)	SPRNKL_MB2 (9271)	138	0.95	0.93
P3: (G-1+N-1)	SW138_CAP (9016)	138	0.95	0.94
P3: (G-1+N-1)	TPOST_LD1 (9278)	138	0.95	0.93
P3: (G-1+N-1)	TPOST_LD2 (9281)	138	0.95	0.93
P3: (G-1+N-1)	TPOST_LD3 (9282)	138	0.95	0.93
P3: (G-1+N-1)	VEGA (9285)	138	0.95	0.94
P3: (G-1+N-1)	WALNUTCK (9284)	138	0.95	0.94
P3: (G-1+N-1)	WINCHES (9042)	345	0.98	0.92
P6-2: (X-1+N-1)	KRAMER (9276)	138	0.95	0.93
P6-2: (X-1+N-1)	MC1013BT (9082)	138	0.95	0.93
P6-2: (X-1+N-1)	MC138_CAP (9011)	138	0.95	0.93
P6-2: (X-1+N-1)	MCNEIL_DB1 (9076)	138	0.95	0.93
P6-2: (X-1+N-1)	MCNEIL_MB1 (9079)	138	0.95	0.93
P6-2: (X-1+N-1)	MCNEIL_MB3 (9077)	138	0.95	0.93
P6-2: (X-1+N-1)	WELLSB_LD1 (9288)	138	0.95	0.93
P6-2: (X-1+N-1)	WELLSB_LD2 (9289)	138	0.95	0.93
P7: N-1	AMD (9151)	138	0.95	0.94
P7: N-1	ANGUSVAL (9155)	138	0.95	0.94
P7: N-1	ASHTONW_MB1 (9226)	138	0.95	0.94
P7: N-1	ASHTONW_MB2 (9224)	138	0.95	0.94
P7: N-1	AUSTNDAM (9139)	138	0.95	0.94
P7: N-1	AUSTROP8 (9328)	138	0.95	0.93
P7: N-1	BAL138_CAP (9017)	138	0.95	0.94
P7: N-1	BC138_CAP (9002)	138	0.95	0.94
P7: N-1	BEECREEK_MB1 (9160)	138	0.95	0.94
P7: N-1	BRACK (9166)	69	0.95	0.94
P7: N-1	BRSTRM_MB1 (9165)	138	0.95	0.94
P7: N-1	BRSTRM_MB2 (9163)	138	0.95	0.94

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P7: N-1	BULICK_LD1 (9161)	138	0.95	0.94
P7: N-1	BULICK_LD2 (9162)	138	0.95	0.94
P7: N-1	CA69_CAP (9004)	69	0.95	0.94
P7: N-1	CAMERON (9171)	138	0.95	0.94
P7: N-1	CARDINAL (9179)	138	0.95	0.94
P7: N-1	CENTAUS (9269)	69	0.95	0.94
P7: N-1	CL138_CAP (9003)	138	0.95	0.94
P7: N-1	DAFFIN (9184)	138	0.95	0.93
P7: N-1	DECKER_MB1 (9187)	138	0.95	0.94
P7: N-1	DECKER_MB3 (9188)	138	0.95	0.94
P7: N-1	DESSAU (9193)	138	0.95	0.93
P7: N-1	DUNLAP5 (9044)	345	0.95	0.92
P7: N-1	DUNLAP8 (9045)	138	0.95	0.93
P7: N-1	EAST_VILLAGE (9195)	138	0.95	0.94
P7: N-1	EDBLUESTN (9196)	138	0.95	0.94
P7: N-1	FIESTA_MB1 (9244)	69	0.95	0.94
P7: N-1	FIESTA_MB2 (9243)	69	0.95	0.94
P7: N-1	FISKVIL (9199)	138	0.95	0.94
P7: N-1	FV138_CAP (9006)	138	0.95	0.94
P7: N-1	GARFIELD5 (9048)	345	0.98	0.93
P7: N-1	GARFIELD8 (9071)	138	0.95	0.94
P7: N-1	GROVE (9200)	138	0.95	0.94
P7: N-1	HA69_CAP (9007)	69	0.95	0.94
P7: N-1	HAMLTN_MB1 (9203)	138	0.95	0.94
P7: N-1	HAMLTN_MB2 (9202)	138	0.95	0.94
P7: N-1	HARRIS (9204)	69	0.95	0.94
P7: N-1	HIDDENVL (9207)	138	0.95	0.94
P7: N-1	HOLLY_MB2 (9213)	69	0.95	0.94
P7: N-1	HOLLY_MB3 (9214)	69	0.95	0.94
P7: N-1	HOWARDLN (9217)	138	0.95	0.94
P7: N-1	HV138_CAP (9008)	138	0.95	0.94
P7: N-1	JETT (9220)	138	0.95	0.94
P7: N-1	JUSTINLN (9225)	69	0.95	0.94
P7: N-1	KINGSB_DB1 (9123)	138	0.95	0.94
P7: N-1	KINGSB_MB1 (9122)	138	0.95	0.94
P7: N-1	KINGSBERY (9125)	69	0.95	0.94
P7: N-1	KOENIG (9227)	69	0.95	0.94
P7: N-1	L_ZORN_5_1Y (7042)	345	0.92	0.92
P7: N-1	LAKESHORE (9228)	138	0.95	0.94
P7: N-1	LOSTPINES (9041)	345	0.95	0.92

NERC Contingency Category	Monitored Element	Voltage Level (kV)	Base Loading (p.u.)	Min Loading (p.u.)
P7: N-1	MAGPLANT (9238)	138	0.95	0.94
P7: N-1	MCNEIL (9080)	69	0.95	0.94
P7: N-1	MP138_CAP (9010)	138	0.95	0.94
P7: N-1	MTCNTR_MB1 (9164)	138	0.95	0.94
P7: N-1	MTCNTR_MB2 (9167)	138	0.95	0.94
P7: N-1	MUELLER (9342)	138	0.95	0.94
P7: N-1	NORTHL_MB1 (9128)	138	0.95	0.94
P7: N-1	NORTHL_MB3 (9127)	138	0.95	0.94
P7: N-1	NORTHL69 (9129)	69	0.95	0.94
P7: N-1	PE_MB1 (9118)	138	0.95	0.94
P7: N-1	PE_MB2 (9119)	69	0.95	0.94
P7: N-1	PE_MB3 (9117)	138	0.95	0.94
P7: N-1	PE138MB1_CAP (9014)	138	0.95	0.94
P7: N-1	PEDERNAL (9257)	69	0.95	0.94
P7: N-1	RAINEYST (9261)	138	0.95	0.94
P7: N-1	RIVERPLACE (9260)	138	0.95	0.94
P7: N-1	SEAHOLM (9132)	138	0.95	0.94
P7: N-1	SOUTHEAST (9240)	138	0.95	0.95
P7: N-1	STECK (9275)	138	0.95	0.94
P7: N-1	STONEV (9237)	138	0.95	0.95
P7: N-1	SUMMIT_MB1 (9279)	138	0.95	0.94
P7: N-1	SUMMIT_MB2 (9280)	138	0.95	0.94
P7: N-1	TRIDGE_MB1 (9190)	138	0.95	0.94
P7: N-1	TRIDGE_MB2 (9191)	138	0.95	0.94
P7: N-1	UTBALC (9283)	138	0.95	0.94
P7: N-1	WARREN (9286)	138	0.95	0.94
P7: N-1	WEBBERSOL (9287)	138	0.95	0.93
P7: N-1	WHELESS (9291)	138	0.95	0.94
P7: N-1	WI138_CAP (9018)	138	0.95	0.94
P7: N-1	WILIAMSN (9295)	138	0.95	0.94

Table A.1.7: Unsolved Power Flows Observed Under NERC P1(N-1), P7(N-1), P3(G-1+N-1), and/or P6-2(X-1+N-1) Conditions Outside the Study Area

No	Contingency
1	(REDACTED)
2	(REDACTED)
3	(REDACTED)
4	(REDACTED)
5	(REDACTED)

No	Contingency
6	(REDACTED)
7	(REDACTED)
8	(REDACTED)
9	(REDACTED)
10	(REDACTED)
11	(REDACTED)
12	(REDACTED)
13	(REDACTED)
14	(REDACTED)

A.2:

Sample plots demonstrating acceptable responses to system contingencies for the recommended option (Option 3A) are shown below:

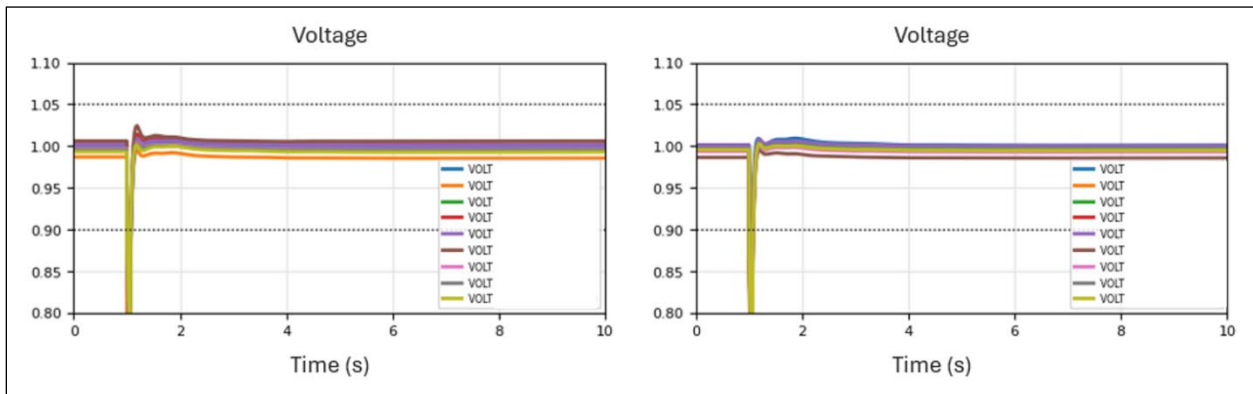


Figure A.2.1: Example Voltage Plots for P4 Event

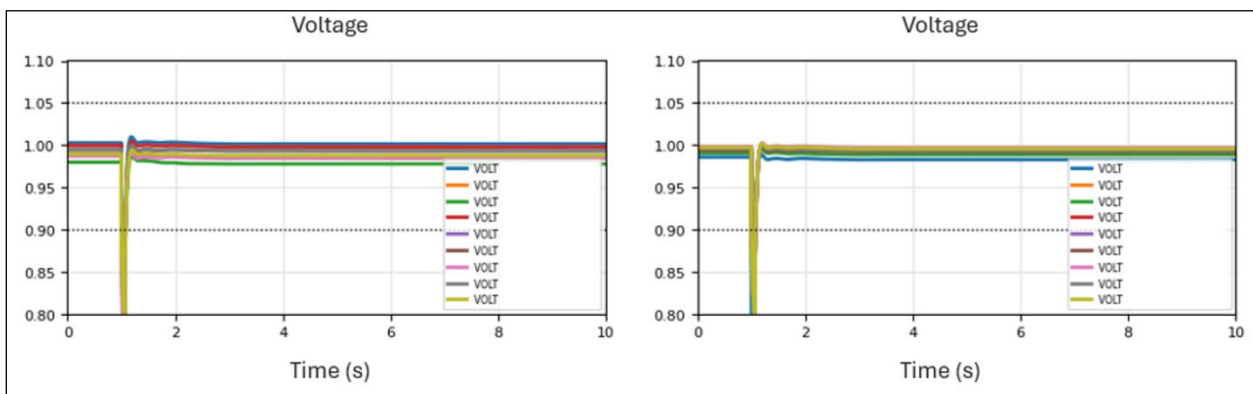




Figure A.2.2: Example Voltage Plots for P7 Event

B: Attachments

Table B.1: Project Related Document

No	Document Name	Attachment
1	CPS Energy Reactive Power Planning Project	 CPS Energy Reactive Power Planning Rep
2	CPS Energy Helotes 345/138-kV Switching Station and Autotransformer Addition at Eastside Switching Station Project	 CPS Helotes_Switching_!