



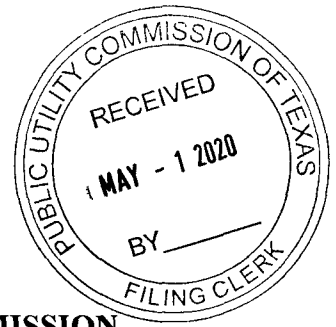
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PUC PROJECT NO. 39339



REPORT FOR ELECTRIC UTILITY

**INFRASTRUCTURE STORM
HARDENING PURSUANT TO
SUBSTANTIVE RULE §25.95**

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**PUBLIC UTILITY COMMISSION
OF TEXAS**

LCRA Transmission Services Corporation

Storm Hardening Plan Summary

May 1, 2020

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LCRA TSC Storm Hardening Plan Summary

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BACKGROUND

Public Utility Commission of Texas (PUC) Substantive Rule 25.95 requires each electric utility to develop a Storm Hardening Plan that provides for the implementation of cost-effective strategies to increase the ability of its transmission and distribution facilities to withstand extreme weather conditions. Further, Substantive Rule 25.95 requires that electric utilities: a) develop a Storm Hardening Plan, b) file a summary of the Plan with the commission by May 1, 2011, c) each subsequent year by May 1 file a detailed summary of any revisions to the Plan, and d) each subsequent year by May 1 file a detailed summary of progress in implementing the Plan.

LCRA TSC developed and filed a Storm Hardening Plan as required and filed a summary of the Plan with the commission on April 29, 2011. In general, LCRA TSC's Storm Hardening Plan consists of cost effectively addressing the design of applicable transmission lines considered to be at slight to moderate risk of storm damage. This is accomplished by enhancing LCRA TSC's existing practices.

This May 1, 2020 document is a subsequent filing to report on changes to the Plan as well as progress in implementing the Plan. Similar timely filings have been made by May 1 in 2012, 2013, 2014, 2015, 2016, 2017, 2018, and 2019.

PLAN CHANGES

Since the filing of its revised Storm Hardening Plan in 2014, LCRA TSC has made no significant revisions to the Plan. All of LCRA TSC's approximately 1,600 miles of circuits in the 100 (or greater) mile per hour (MPH) National Electric Safety Code (NESC) wind zone have either been upgraded or analyzed for compliance with storm hardening criteria. Circuits remaining to be evaluated to determine whether they meet the NESC wind criteria are all in the 90 MPH wind zone.

In 2019, LCRA TSC acquired 97.16 circuit miles of transmission line from Oncor Electric Delivery Company (Oncor) and Central Texas Electric Cooperative (CTEC), approved in Docket Nos. 49536 and 49357 respectively. These 97.16 circuit miles have been added to the plan for analysis to ensure they can withstand extreme weather conditions in accordance with requirements of Substantive Rule 25.95. Of LCRA TSC's approximately 4,500 circuit miles of overhead transmission lines, 176.39 miles remain to be upgraded or analyzed (all in the 90 MPH wind zone), inclusive of the 97.16 circuit miles acquired from Oncor and CTEC.

PLAN IMPLEMENTATION

Most of the lines owned by LCRA TSC are located in Central Texas and are not exposed to hurricane-force winds. The minimal exposure to hurricanes notwithstanding, LCRA TSC's existing practice of routinely improving new construction to meet the latest design codes, implementing remote-controlled switching, and maintaining a well-defined and monitored inspection program results in a cost-effective storm hardening strategy to improve system reliability.

Appendix A to this document provides a list of transmission circuits that have not yet been analyzed for compliance with LCRA TSC's Storm Hardening Plan. LCRA TSC has in the previous 9 years analyzed approximately 3,851 miles of transmission circuits that were designed and installed under the 2002 NESC, or a later edition. This summary indicates the primary elements of the Plan have been or are being performed on a regular basis, including but not limited to:

1. Adherence to the National Electrical Safety Code wind loading requirements. This review has been conducted and no significant changes were noted that would alter the design of LCRA TSC transmission lines with regard to storm hardening.
2. LCRA TSC has continued the routine inspections of transmission lines in accordance with LCRA TSC's

Maintenance Standard, where 69-kV and 138-kV lines are patrolled at least once every 24 months and 345-kV lines are patrolled annually.

3. In accordance with the Plan, LCRA TSC routinely analyzes all existing structures, reviews maintenance reports, and, where appropriate, performs storm hardening.
4. LCRA TSC previously adjusted the line inspection schedule to facilitate the Plan's goal of analyzing all lines in wind zones exceeding 100 MPH within five years of adoption of the Plan. As of May 1, 2016, this goal was completed.

When Hurricane Harvey hit the Texas gulf coast in 2017, LCRA TSC's circuits did not sustain any structure (tower) damage; however, during this event, LCRA TSC experienced hardware and conductor damage on the 69-kV line (T474) from the AEP Rockport Substation to the AEP Fulton Substation. All repairs were completed within 11 days. This line was completely rebuilt in 2004 and meets NESC 2002 design load criteria. All structures on the line are considered hardened and adequate for a 130 MPH extreme wind load case.

LCRA TSC's Storm Hardening Plan continues to be a cost-effective and appropriate method for managing the storm hardening issues that are anticipated to be encountered within the LCRA TSC transmission system. LCRA TSC does not anticipate any further changes to the Plan and is prepared to continue with further implementation of the Plan until its completion in 2021.

APPENDIX A
CIRCUITS TO BE ANALYZED

APPENDIX A

CIRCUIT	LOCATION DESCRIPTION	VOLTAGE (kV)	LENGTH (miles)	WIND ZONE (MPH)	Structure Type
T107	BUCHANAN – INKS DAM DCT w/ T635	69	2.35	90	NS Lattice Tan, DC Lattice DE, LCRA DC Stl H-frame, LCRA SC Stl H-frame, Lat Flat Top DE, DC Lat Ang
T195	MARBLE FALLS/GRANITE MOUNTAIN - T195	138	4.07	90	DC Lat DE, NS Lat Tan, Lat Angle, OS Lat Tan
T262	REDWOOD – McCARTY LANE EAST	138	2.30	90	Concrete H-frames (DE & Tan), DC Lat DE, OS Lat Tan
T266	GILLESPIE – NIMITZ	138	2.90	90	Wood, Lat Flat Top DE, Unkn Lat Flat Top, TC Lat Tan, DC Lat DE, OS Lat Tan, Lat Ang, LCRA Stl Pole
T287	LIVE OAK/ FREDERICKSBURG/ GOEHMANN	69	4.87	90	Wood Pole
T288	LIVE OAK / HARPER	69	21.63	90	Wood Pole
T289	FREDONIA / MASON	69	11.08	90	Wood, Steel Pole
T290	BUCHANAN / BLUFFTON	69	6.82	90	Wood Pole
T291	BUCHANAN / KINGSLAND 2 / KINGSLAND 1	69	6.16	90	Wood Pole, Wood H-Frame
T357	SHERIFFS POSSE/PARKWAY LINE - T357	138	5.68	90	Wood, DC Lat DE, Stl Pole
T374	SEGOVIA /JUNCTION TAP - T374	69	9.84	90	Conc Pole, Stl Pole, SC Lat Delta DE, NS Lat Tan
T376	GRANITE MOUNTAIN/WIRTZ/FERGUSON T376	138	9.42	90	DC Lat DE, OS Lat Tan, Lat Ang, Stl Pole, Formet Tower Pole,
T380	TURNERSVILLE – BUDA SPLIT	138	0.40	90	Stl Pole, Wood, DC Lat DE, Conc Pole, LCRA Stl Pole
T387	HOWARD LANE/WELLS BRANCH - T387	138	0.91	90	Stl Pole, LCRA Stl H-frame
T393	COPPERAS COVE (PEC) - COPPERAS COVE (ONCOR)	138	3.95	90	Wood H-Frame, Concrete H-Frame
T400	SANDY CREEK / KINGSLAND 1	69	7.28	90	Wood Pole

APPENDIX A

CIRCUIT	LOCATION DESCRIPTION	VOLTAGE (kV)	LENGTH (miles)	WIND ZONE (MPH)	Structure Type
T412	BASTROP ENERGY/AE GARFIELD 345KV - T412	345	0.38	90	Concrete
T459	KENDALL- CPS TIE 345KV - T459	345	20.83	90	DC Lat DE, OS Lat Tan, Stl Pole
T495	MANOR/CEDAR HILL 138KV - T495	138	8.19	90	Stl Pole, Concrete, Lat Angle, DC Lat DE
T508	HARPER / DOSS	69	14.14	90	Wood Pole
T526	WELLS BRANCH / ROUND ROCK SOUTH	138	1.93	90	Steel Pole, A-frame
T534	MENDOZA - LYTTON SPRINGS - T534	138	0.58	90	Concrete Tangent monopole with steel Arms, Steel Pole H frame Flat DE, Lattice DE, Tangent Flat H frame steel pole
T574	HARRIS BRANCH/SHADOW GLEN/MANOR 138KV - T574	138	2.96	90	Steel Pole, A-frame, Concrete, Lat DE, Lat Angle, Lat Delta DE
T649	SHADOW GLEN/MANOR 138KV - T649	138	1.78	90	Steel Pole, A-frame, Concrete, Lat DE, Lat Angle, Lat Delta DE
T654	STARCKE/WIRTZ - T654	138	6.64	90	OS Lat Tan, Lat Angle, DC Lat DE
T669	MCELMURRAY / ESKOTA	138	5.78	90	Wood, Concrete Pole
T727	LEON / PUTNAM (STR #9/10)	138	9.12	90	Wood Pole, Wood H-Frame
T728	ELGIN / ELGIN TAP	138	4.40	90	Steel Pole, Wood H-Frame
TOTAL			176.39		