

Operations Report

Eddie Dauterive | Chief Operations Officer

Safety & Technical Training

Preventable:

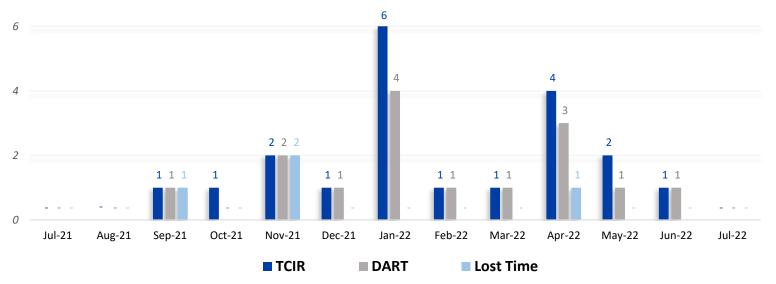
2021 YTD:

2022 YTD:

Personal Incidents

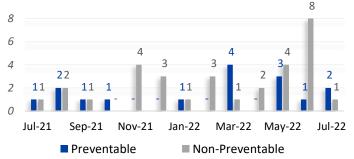
Reportable Injuries, Days Away, and Lost Time Incidents

2021 YTD: DART Days - 230, Lost Time Days - 118 2022 YTD: DART Days - 128, Lost Time Days - 10



Vehicle Incidents

Preventable & Non-Preventable



KPI Progression

2022 Period Two



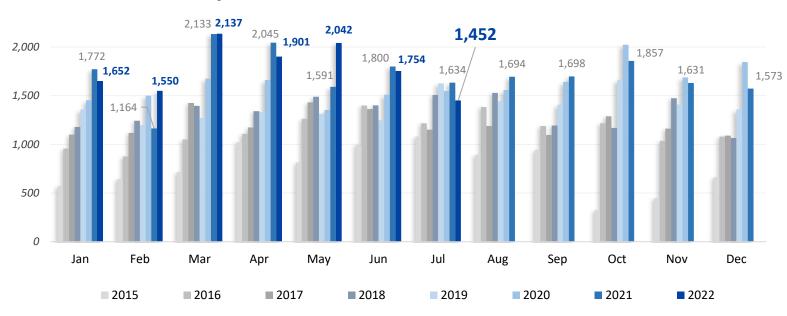




System Growth

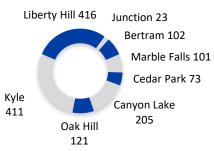
Line Extensions Completed

2019: 16,640 2020: 19,458 2021: 20,592 2022 YTD: 12,488



Line Extensions

Per District (1,452)



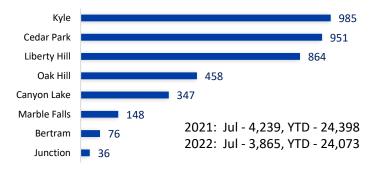
Miles of Distribution Line:

Underground: 6,608 (27%) Overhead: 17,540 (73%)

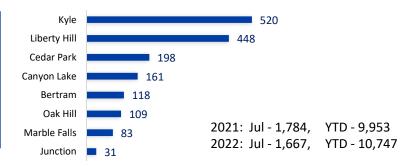
Total: 24,148



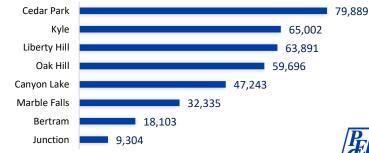
Member Applications (3,865)



Meter Growth (1,667)

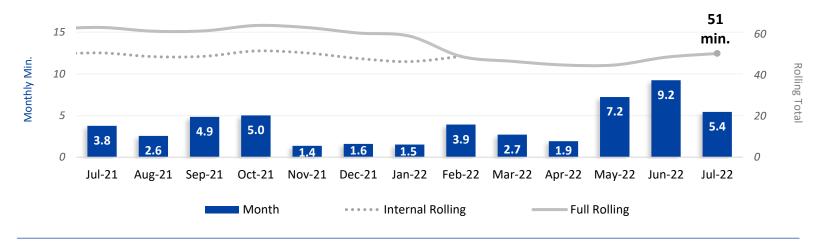


Meter Totals (375,463)

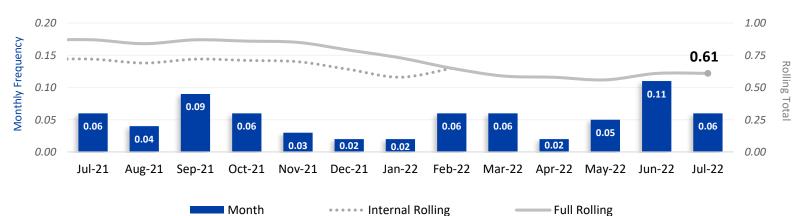


Reliability

System Average Interruption Duration Index (SAIDI)



System Average Interruption Frequency Index (SAIFI)





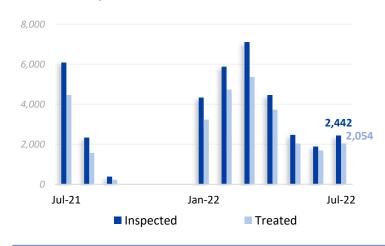


Distribution Maintenance

Pole Testing & Treatment (PTT)

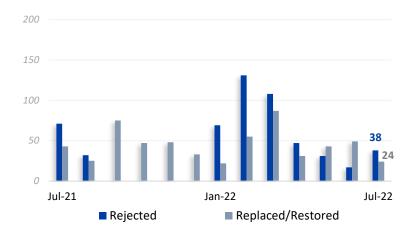
Poles Inspected & Treated

2021 YTD: Inspections - 36,764, Treated - 28,717 2022 YTD: Inspections - 28,594, Treated - 22,859



Poles Rejected & Replaced/Restored

2021 YTD: Rejected - 594, Restored - 605 2022 YTD: Rejected - 441, Restored - 311



Vegetation Management

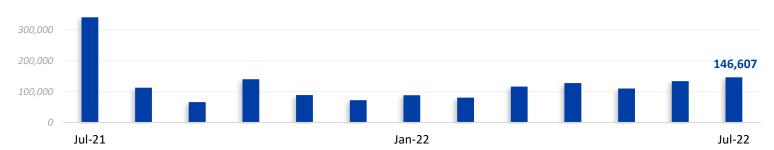
Vegetation Pruned (Ft.)

2021 YTD: 2,363,557 ft.

Jul. Locations Worked: 1,114

Jul. Poles Cleared: 475

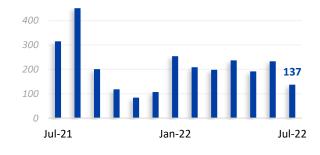
2022 YTD: 804,246 ft. Jul. URD Clearings: 345





URD Pad Restorations

2021 YTD: 605 2022 YTD: 311



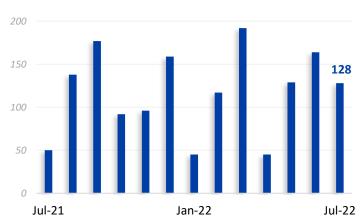


Distribution Maintenance

Technical Services

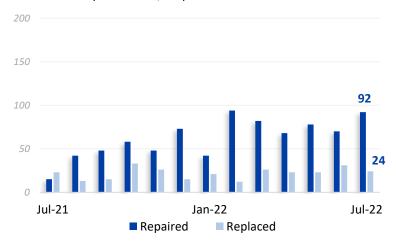
Equipment Inspections

2021 YTD: 766 2022 YTD: 820



Equipment Repaired & Replaced

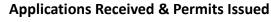
2021 YTD: Repaired - 361, Replaced - 238 2022 YTD: Repaired - 462, Replaced - 160



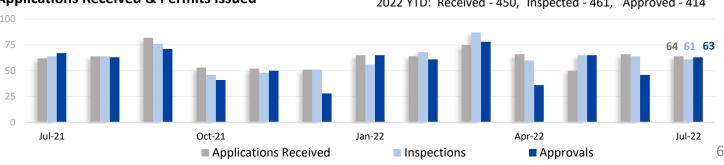




Pole Contacts



2021 YTD: Received - 417, Inspected - 452, Approved - 447 2022 YTD: Received - 450, Inspected - 461, Approved - 414





Distribution Maintenance

Vegetation Mgmt Strategy Recognized in T&D World Magazine

Electric Utility Operations



Texas Co-op Shifts to Condition-Based VM

By leveraging technology, PEC can keep up with long vegetation management cycles, customer growth and budgetary constraints.

By GEORGE LEADER and PENNY SWANNER, Pedernales Electric Cooperative

Traditional, cycle-based approaches to tree trimming lack the ing a new approach to remote sensing, using a combination insight utilities need to make the most accurate decisions about of Geiger-Mode LiDAR and high-resolution spectral satellite where to allocate their time and resources within the network. data, PEC has gained access to extremely precise imagery com-Under a cycle-based approach, many managers are forced bined with analytics and Artificial Intelligence (AI) from IBM to guess which areas are at highest risk due to vegetation en- to identify the highest priority feeders and spans in the netcroachment and which areas should be prioritized over others. work.

Managers may wonder how to extend their knowledge and insight to make decisions that will optimize maintenance Managing Vegetation spend to target the areas that matter most. For example, one PEC, based in central Texas, is the largest electric distribution cooperative has adopted technology that can deliver timely and cooperative in the United States with nearly 8,100 square miles trustworthy information about the true condition of vegetation of service territory and more than 19,000 miles of overhead

technology in vegetation maintenance to bring value to its of a vast geography and a variety of environmental conditions,

electric utilities, which maintain large areas of distribumembership. The cooperative has recently become one of the tion line corridors over vast areas and widely varied environmental conditions, face the challenges of keeping up based, time-sensitive approach to vegetation maintenance in with vegetation maintenance cycles and budgetary limits. favor of a 100% condition-based maintenance strategy. Adopt-

electric lines in an area commonly known as the Texas Hill Pedernales Electric Cooperative (PEC) has been using new Country. Much like other utilities, PEC manages the challenges soils, grasslands, low growing brush and varied species that each could be treated differently. These include oak, pecan, hackberry, ash juniper conditions range from extreme hear and dryness, which can increase wildfire risks, to tropical events and even icing, as experienced in February 2021 with Winter Storm Uri. Geiger-Mode LiDAR, an efficien

and high-performance mode of data collection, is the workhorse behind the highest value insights, offering

managing immense territories and challenging environmental conditions the opportunity to know with confidence where of reliability scores, the co-op sought to improve the reliability which vegetation encroachments matter the most.

network reliability, which is already above industry averages, on a shorter time frame, which disrupted the five-year cycle continues to improve as a result.

Current Practices

Hundreds of interviews with utilities across North America, Introduction to Technology and indeed most of the globe, reveal that the most common To address these challenges, PEC embraced an IBM technolapproach to maintaining distribution corridors is by cycle. The ogy, which uses remote sensing to provide condition-based in

Many electric utilities respond with ourage data, a sort of prioritization by tree-SAIDI (System Average Interruption Duration Index).

For many years, PEC had relied aimed at keeping encroachments under control throughout the territory. However, despite efforts and a \$10 million dollar budget to cove the entire area, the co-op struggled to keep up with minimizing the risk related contact, falling behind over the years in 100% coverage of the time-based approach. The staff was



June 2022 | T&D World 40E This example shows a view of the scorecard and some basic KPIs showing a C score for vegetation conditions and a Priority 2 designation for work maintenance prioriti-

zation with a recommendation for bucket truck type of maintenance.



ments of vegetation encroachments. These examples of V-Cut (left) and L-Cut (right) directional pruning create challenges for accurate satell

into the right analytics environment, offers electric utilities there was little to no time left for planning the next year's work Despite having already maintained a well above average ser they have the greatest risk to their network. PEC is using an of the overall network and further mitigate wildfire risk. PEC IBM technology-based application to combine this new form experienced the effects of the 2011 Bastrop and Spicewood of high-resolution point cloud data (30 points per square meter) and multi-spectral satellite data, along with environmental worked diligently to combat conditions, which would most factors such as wildfire conditions and severe weather, to know likely contribute to ignition. PEC also experienced the February 2021 icing storm, which shut down much of Central Texas, Using this technology, PEC is optimizing its resources based though overall, PEC fared well in regard to minimal power outon trustworthy, condition-based insights. The cooperative's ages, Because of factors like these, some areas needed pruning making it difficult for managing the traditional time-cycle pro-



highest-risk segment due to the clos st encroachment was a D score based on the risk of vegetation contact of -3 feet. The Priority score (P1, P2 P3, P4) is designed to accommodate for the incorporation of the vegeta with priority variables like popula tion, criticality of the area served and even wildfire risk, using a Wildfire Risk model.

nalytics, which can include things initial score For example a D score once maintained in the field, can be

reverted to an A score in the application. For each of the scores alculated a scoring system us- especially those scores deemed highest risk like D and C vegetathe priority the area of inter-this data is bosted, analyzed and displayed with a tool set called n include anything the co-op IBM Environmental Intelligence Suite

For PEC, these KPIs included Early Results

h-priority work and pose a risk

conductor, volume of trees in In the first two years of the project, PEC began a well-thought--determined range of the con- out plan to make use of high-resolution spectral satellite data erest and even a financial cal- for vegetation encroachment scoring. The co-op also began an it maintenance would require effort to tag roughly 200,000 tree species across its overall serbucket truck. From the KPIs, vice territory. Not only would targeting areas for high-priority work due to potential encroachments help transition PEC from the cycle-based to condition-based approach to maintenance, dimensional distances to conwere located to better plan for removals of hazardous trees

This transition allowed PEC to create a program where some of the maintenance on species with timing considerations like oak wilt could be deferred to the most appropri-

When PEC first introduced the technology and satellite data, the co-op immediately saw the value of it. With satellite mans and AI technology. PEC was able to move away allows the co-on to see the entire area and create a plan to proactively prune trees before they create an outage.

Challenges to the Early Technology

One problem with satellite data is the two-dimensional na ture of the imagery. This leaves some gaps in accuracy when high-precision KPI is required to direct millions of dollars of maintenance budget towards condition-based work

Satellite data makes use of multi-spectral analytics to letect vegetation using Normalized Difference Vegetation Index (NDVI) and other elements and then "estimate" tree heights using AI modeling. Reasonable accuracy can be achieved with tree heights, but that is only half of the equation. To achieve high levels of accuracy, the program must predict not only the height and shape

rs are located in rees and conduc detect poles and or is introduced

hts were still estihich do not capsarance was indis on would be even

proved source of imagery for PEC is ahead of the curve, and already experiencing a consi recision vegetation encroach- erable benefit of about \$2.5 million per year. We're please not generally considered as in our results and confident our investment will continue to is case due to the immense benefit PEC and its members for years to come. Over the next

w abnormally long collection while also improving safety for our lineworkers in the field

Electric Utility Operations

an issue. Most often LiDAR and reliability for our members." maintenance when the use Condition-based vegetation insights can help distribution t the immense investment, as companies better manage their budget and resources to tar get the highest risk areas in their network. Investments may result in improved reliability, increased cost savings, safe naging began to emerge. Not workers and happier customers. Technologies are available curate to within a foot, it was today that can help distribution companies start this jour uickly (compared to tradition- ney, and PEC has experienced firsthand how investments in royide the necessary detection - this space help customers, employees and the bottom line tion to managing the physical The utility that has the best chance to succeed is one that runing, like V-cuts, L-cuts and has leadership support to embrace technology, alter work bility with canopy penetration flow processes to accommodate for previously undiscovere ly speaking, Geiger-Mode Li- intelligence and finds the right technology partner to see the the cost of traditional LiDAR organization through the transformation.

nstonal image, PEC was able to GEORGE LEADER (George Leader@becl.com) is PEC vegetation maintenant enabling pruning contractors manager. He has more than 40 years in the electrical industry, most of which was enant as a lineman working at an IOLL a municipality and two cooperatives - all in Texas. The last 12 years he has built and managed

ances are met without having to deploy personnel to the field.

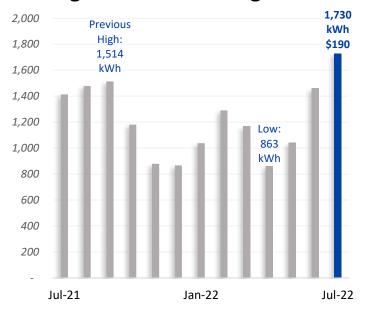
"Following Winter Storm Uri in February 2021, most industry, working at PEC for six of those years. She graduated with a Bachelo Texas utilities began to double or even triple their vegeta- of Science in Forestry from Stephen F. Austin State University and is an tion maintenance budgets," said Randy Kruger, PEC chief ISA-Certified Arborist Utility Specialist TX-4108AU.

eas. For instance, PEC used the data to calculate the height of the vegetation program for Pedern certain voltages of conductors above specified bodies of water. ISA-Certified Arborist TX-3977A. allowing the Transmission Control Center to identify specifications on towers fit for hosting fiber and ensure NESC clear- maintenance supervisor. She has more than 12 years of experience in

40D T&D World | June 2022

Member Relations

Average Residential Usage



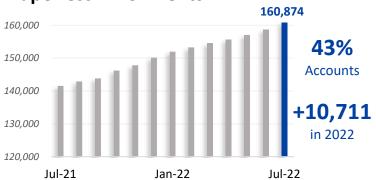
Member Contacts

Avera	ge Handle Time	Jul Phone Contacts: Jul Office Contacts:	25,236 5,931
13:26			13:01
12:57			
12:28			н
12:00		нини	н
11:31	Trad H H		н
11:02			н
10:33			н
10:04			н
9:36			
	Jul-21	Jan-22	Jul-22



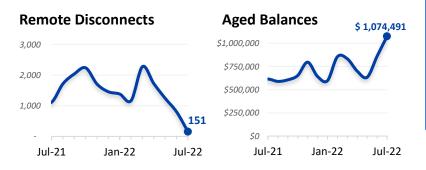
Contact Types	2021: 419,2	77 Contacts
Main Contact Types	Jul. To	otals
Service Request	10,368	32%
Payment	6,623	20%
Billing Inquiry	4,927	15%
Payment Arrangement	2,222	7%
Account Update	1,660	5%
Autopay Deposit Waiver	967	3%

Paperless Enrollments



Collections

20 days with no collection activity due to high temp.



Energy Services

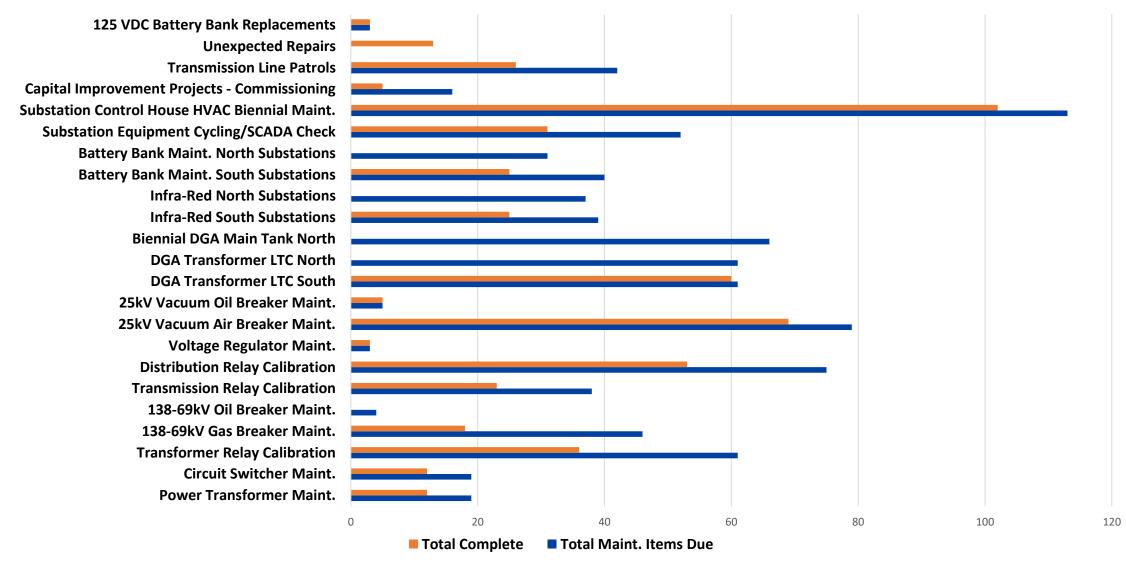
2021 YTD: Audits - 204, Insp. - 855 2022 YTD: Audits - 175, Insp. - 1,128





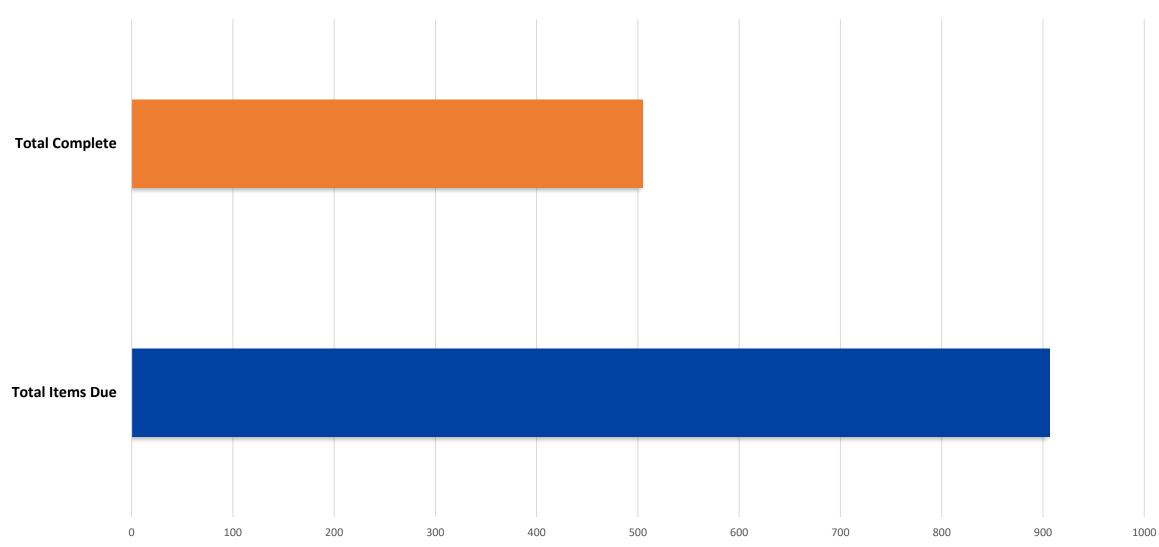
Substation & Transmission Maintenance

2022 Itemized Maintenance By Equipment



2022 Substation & Transmission Maintenance

Overall Status Year-to-Date



Substation Engineering Projects

Overall Status

Project	Project Phase	Description	Completion Date	Percent Complete
WS - BH Remote Ends	Construction	Upgrade line protection relay panels	May 2022	100%
GB T4 Transformer Relay Panel Replacement	Construction	Upgrade T4 transformer panel from electromechanical to digital relays	May 2022	79%
CC T1 Total Breaker Addition	Engineering	Add total breaker to T1 transformer for reliability	Oct 2022	65%
KY T1 Upgrade	Engineering	Upgrade T1 transformer	Nov 2022	43%
138 kV Breaker Replacements	Engineering	Replace four end-of-life oil circuit breakers with SF6 breakers	Dec 2022	51%
Substation Satellite Clock Installations	Construction	Install satellite clocks at substation for time synchronization to relays	Jan 2023	69%
BR Bus Upgrade	Engineering	Upgrade bus to double-bus double-breaker	Apr 2023	38%
SJ T3 Addition	Engineering	Add third power transformer	Jun 2023	37%
LH T4 Addition	Engineering	Add third power transformer	Jun 2023	72%
BU T1 Upgrade	Engineering	Upgrade T1 transformer	Aug 2023	60%
HE Substation	Engineering	Construct new substation	Sep 2023	100%
Mobile Substation Upgrades	Engineering	Upgrade circuit switchers and relay protection on three mobile substations	Oct 2023	29%
JN Substation Upgrade	Engineering	Upgrade T1 transformer and add line breakers (AEP)	Oct 2023	23%
MF - TP - CV Remote Ends	Engineering	Upgrade line protection relay panels	May 2024	13%

Planning Engineering Projects

Overall Status

Project	Completion Date	Percent Complete
Load Projections Study	Jan 2022	100%
UFLS Study	May 2022	100%
4CP Study	May 2022	100%
Summer Contingency	Jun 2022	100%
Regulator Settings	Jun 2022	95%
Capacitor Settings	Jul 2022	85%
Antler Battery Study	Aug 2022	98%
CIP Study	Aug 2022	60%
Mock UFLS Study	Nov 2022	0%
Winter Contingency	De 2022	0%
20 Year Plan	Jan 2023	10%
2 Year System Protection Coordination Review	Jan 2024	60%

Transmission Projects

Projects Completed:

- WS BH LA line upgrade (Cedar Park):
 - 5.25 miles, rebuild existing 138 kV line to 440 MVA capacity.
 - Completed and energized on June 30, 2022.

Projects in Engineering:

- MF TP CV FS RU (Oak Hill):
 - 15.41 mi., construction contract awarded, to begin Sep. 2022.
- DS RU Relocation (Oak Hill):
 - On hold pending direction from developer and resolution of complaint filed at PUCT.
- LV NL LA Transmission Overhaul (Cedar Park and Liberty Hill):
 - Coordinating with Substation Design for cut-in to HE Substation.
 - Structural analysis confirmed need to upgrade to meet NESC District loads.
- **SA FC** (Canyon Lake):
 - Raise crossing over Canyon Dam discharge channel, material and poles ordered.
 - U.S. Corp of Engineers granted extension of permit for existing facilities through Jan. 2023.
- MK HN (Oak Hill):
 - Respacing shield wire and conductor to reduce outage vulnerability during extreme weather, material and poles ordered.
- **ML HT** (*Kyle*):
 - Rebuild of single circuit section, material and poles ordered.
 - Railroad signal mitigation study ongoing.



19-Ton Pole Project

Oak Hill District raised a large, 70 ft. concrete pole:

- 2 months to design and approve construction.
- 6 weeks to manufacture.
- 5 weeks to prep site and complete construction.
- Crews worked overnight and coordinated traffic stoppage to place and set the pole.







BCRUA Line Project

PEC was asked to provide power for a deep-water intake project for the Cities of Leander and Cedar Park involving:

- 155 wood poles
- 37 steel poles
- 25 miles of double circuit 795 conductor

To meet critical dates and to address potential water supply concerns, PEC was asked to reduce a 12-mo. construction schedule into 8 mo.:

- 3 PEC crews and 2 contract crews were able to safely and successfully complete the project in 8 mo.
- Project was recognized by NRECA for National Linework Appreciation Day in April.

NEWS

Photo Gallery: Celebrating Lineworkers

Published April 11, 2022 Author

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Pedernales Electric Cooperative's Ronnie Taylor was tasked with leading and completing a critical construction job consisting of setting 192 poles and installing 25 miles of double-circuit 795 conductors. The project will help provide water to some of the fastest-growing areas in Texas. Ronnie's team was asked to take a 12-month project and condense it into eight months, which they accomplished—and accomplished safely. (Submission By: Jason Murray; Photo By: Evan Bradfield)

Throughout April, NRECA is celebrating lineworkers by highlighting the men and women who help keep the lights on in homes across America.



AMI Distribution

- Junction exchanges for TWACs meter upgrades are complete.
- Exchanges in the Eastern territory remain on hold due supply shortages:
 - Estimating receipt of additional residential 2S AMI meters in early 1st quarter, 2023.
 - Closely monitoring the current inventory combined supply of AMI and TWACs available through June 2023 to cover new growth and service repairs.
- Specialty meter exchanges (polyphase AMI) are substantially complete:
 - Polyphase meters are for commercial and industrial locations, 2S AMI meters are for residential locations.
 - All large power meter exchanges are complete.
 - Other meters in targeted areas exchanged across the Eastern territory.
 - Remaining polyphase meters will be exchanged with future residential meter exchanges.

Western Territory - TWACs Upgrades

Junction Exchanges: 100%
Meters exchanged: 6,887
Letters & Emails: 6,633
Member Complaints: 8

Eastern Territory - 2S AMI Exchanges

Liberty Hill District: 100%
Cedar Park: 40%
Meters Exchanged: 121,000
Letters & Emails: 166,000
Member Opt-Outs: 54

Specialty AMI Exchanges

• Liberty Hill: 2,144 • Junction: 68 1,963 Kyle: • Oak Hill: 1,748 Marble Falls: 509 • Canyon Lake: 217 • Bertram: 159 Cedar Park: 259



Facilities

Cedar Park Access	The Cedar Park access road to Anderson Mill has been completed.	
Dripping Springs Storage Yard	The new fence has been installed and a portion of the base material has been installed.	
Johnson City	Installed generators at the Mailroom, the Haley Rd gate, and at fuel pumps.	
Junction	Finalizing design and obtaining bids for yard renovations, pending substation design.	
Leander Development	Building construction is in-progress and on schedule.	
Marble Falls	Finalizing design and obtaining bids for yard renovations.	



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