



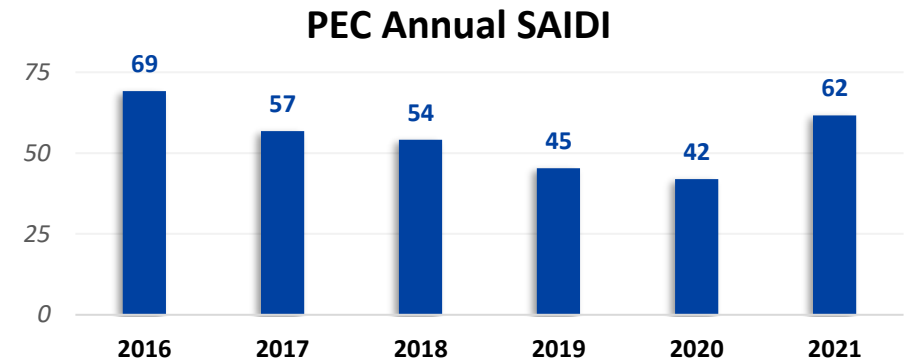
Winter Preparedness & EOP

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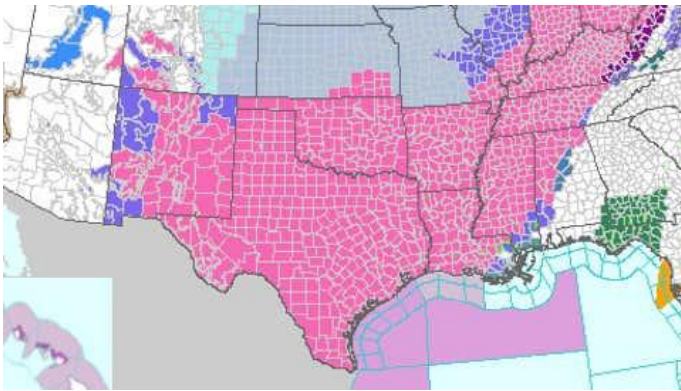
Winter Preparedness & EOP

PEC Reliability

- Year after year, PEC's rankings of reliability metrics among the U.S. Energy Information Administration records are some of the best in the state.
- Prior to the extreme weather event in 2021, PEC's rolling 12-month SAIDI measurement was the lowest on record, at 42 min.



Challenges During the Extreme Winter Event



- All 254 Texas counties were under a National Weather Service winter weather advisory; over 4.5 million Texans were without power.
- The Texas grid was overwhelmed with almost half (49%) of the total generation capacity offline at the highest peak.
- ERCOT required system-wide and repetitive load shedding activities over three days, reaching up to 414 MW of load shed by PEC on Feb. 15.

Post Event Assessments

Immediately after the winter storm, PEC leadership began performing internal performance assessments.

Utilicast Assessment

Retained Utilicast to perform an external evaluation of system operations issues through people, processes, and technology.

Incident Command Team Assessment

Assess Outage Management Systems (OMS) and strengthen coordination with district operations.

External Relations After-Action Review

Improve outage communications and relationships with cities and public officials.

Engineering Transmission & Substation After-Action Review

Improve restoration efforts with mutual assistance and update planning guidelines for weatherization and preparedness.

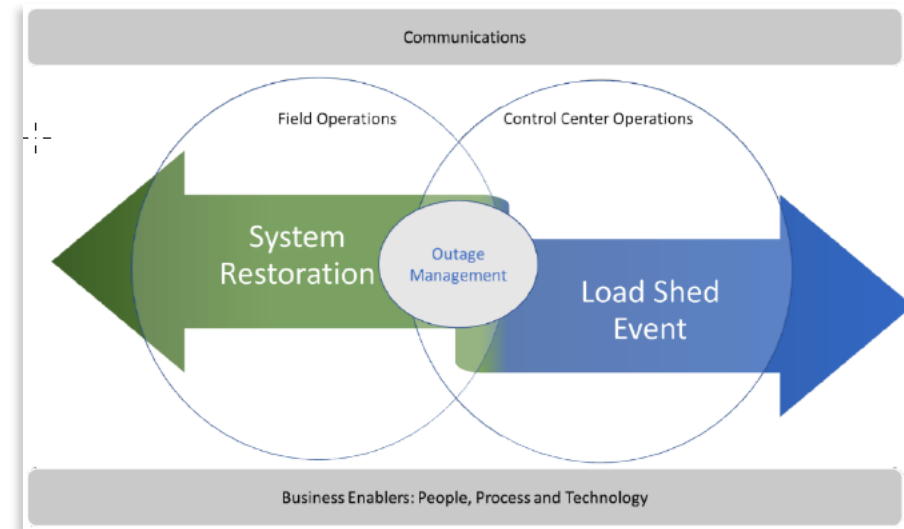
Utilicast Recommendations

PEC's goals for Utilicast was to help identify:

- a) Risk mitigation priorities.
- b) Ways to improve communication and transparency.
- c) Methods to manage vast load-shed responsibilities and outage restoration efforts more efficiently.

Utilicast's Incident Analysis of PEC Response to the 2021 Winter Storm Event resulted in 23 recommendations for emergency response improvement.

Timeline of Assessment:



Utilicast Recommendations

- Recommendations provided by category:
 - 11 applied to Operations
 - 9 applied to Information Technology
 - 2 related to Communications
- Work teams evaluated the Utilicast recommendations and solutions were put into action for each.
- Staff have provided monthly updates of improvement activities.
- Several solutions are long term and will carry over into 2022 as new processes and systems will need time to be fully trained and documented.
- These system enhancements will be part of an Operations Resiliency Plan which will be aligned with the Cooperatives Business Continuity Planning into 2022-2023.

PEC Workflow Matrix to Recommendations

#	Recommendation	PEC Workflows									
		OMS Upgrade	EOP Drills	Critical Load Review	Op. Assessments	I.T. Assessments	Public Affairs Review	Engineering Review	Resiliency Planning	Suspend	
1	Configure OMS to "lock-in" Outages During Load Shed Event	✓	✓								
2	Designate Control Center as Command Center	✓	✓		✓		✓				
3	Rotate Field Engineers with Dispatchers	✓	✓								
4	Improve Situational Awareness Tools	✓	✓		✓		✓				
5	Extend Dispatch Coordination to Districts During Emergency >24 Hours	✓	✓								
6	Reprioritize Critical Load Registry		✓	✓			✓				
7	Validate Load Shedding Configuration and Maintenance Process	✓	✓	✓				✓			
8	Prioritize AMI Deployment to Feeders w/ Critical Load Designations									✓	
9	Customize the AMI Load Control Application	✓	✓					✓			
10	Tune Outage Predictions and Confirmation Process	✓	✓								
11	Augment Drone Program		✓		✓						
12	Retire 2WD Trucks				✓						
13	Complete Assessment of NISC					✓			✓		
14	Employ a Solution Architect									✓	
15	Define a Resilience Plan							✓	✓		
16	Employ Director of Corporate Application Support									✓	
17	Revisit Business Continuity Plan								✓		
18	Establish Performance Metrics		✓			✓			✓		
19	Review Physical Infrastructure		✓			✓			✓		
20	Review Enterprise Task Scheduler		✓			✓			✓		
21	Conduct Load Testing and Performance Tuning		✓			✓			✓		
22	Establish Distributed Communication Hubs		✓				✓				
23	Bolster Market Relations Training			✓	✓						

PEC Weatherization

The Public Utility Commission of Texas approved the **Phase 1 Weatherization Rule** for Generators, Energy Storage Resources, and Transmission facilities to implement winter weather readiness.

Because PEC does not own generation, the rule applies to PEC's battery storage system (BESS) and our network of transmission substations.

Phase 1 – Requires inspection of, and activities related to, Cold Weather Critical Components and submittal of readiness reports to the PUC and ERCOT.

Phase 2 – The PUC will develop reliability standards in a future project that will consist of a more comprehensive, year-round set of weather emergency preparedness that will be informed by a weather study being conducted by ERCOT in consultation with the Office of the Texas State Climatologist.

The two-phase approach will allow standards to be in place for the upcoming winter while still allowing time to develop more robust standards in the coming months.

PEC has completed all action required under Phase 1 and will file a report by Dec. 1 with the PUC to that effect.

LCRA Weatherization

LCRA is also actively making internal improvements to prepare for extreme cold weather events.

- Fuel Risk Management – procured winter outage insurance and adjusting power positions to reduce risk.
- Cold weather preparation procedures:
 - Installing temporary wind protection equipment.
 - Preventative maintenance on freeze protection heat trace circuits.
 - Contracting for larger on-site kerosene storage.
 - Insulation contractors have been on-site.
 - Procedures have been updated with lessons learned from February.
- Held an internal Winter Prep Mtg in early November and PEC is working to schedule a joint preparation meeting.
- Daily conference calls are occurring between plants and stakeholders to review site procedures for actions during freezing temperatures, as well as for possible activation of emergency generation.
- Plant Directors have affirmed that all site procedures have been executed and Sr. Mgmt. participated in site tours.
- LCRA's critical gas infrastructure has been flagged for continued power supply.

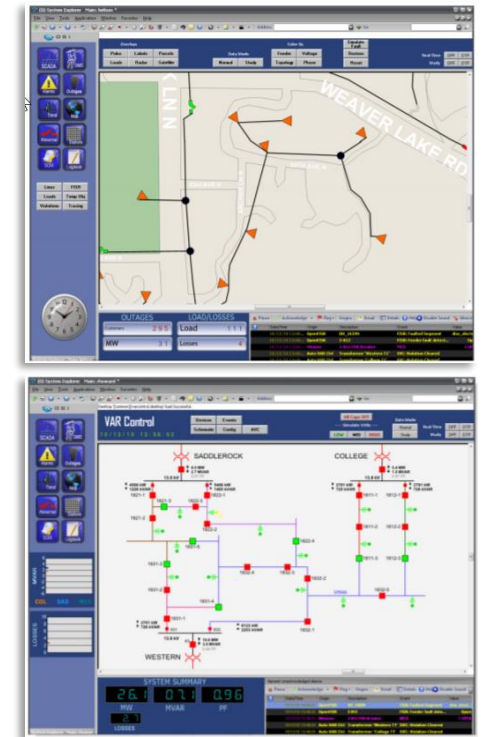
Control Center System Upgrades

Systems Upgraded:

- Existing OSII Distribution Management System (DMS) and SCADA system to the most current OSII versions.
- Replaced the previous Outage Management System (OMS) with a fully integrated OSII Advanced system.

System Benefits:

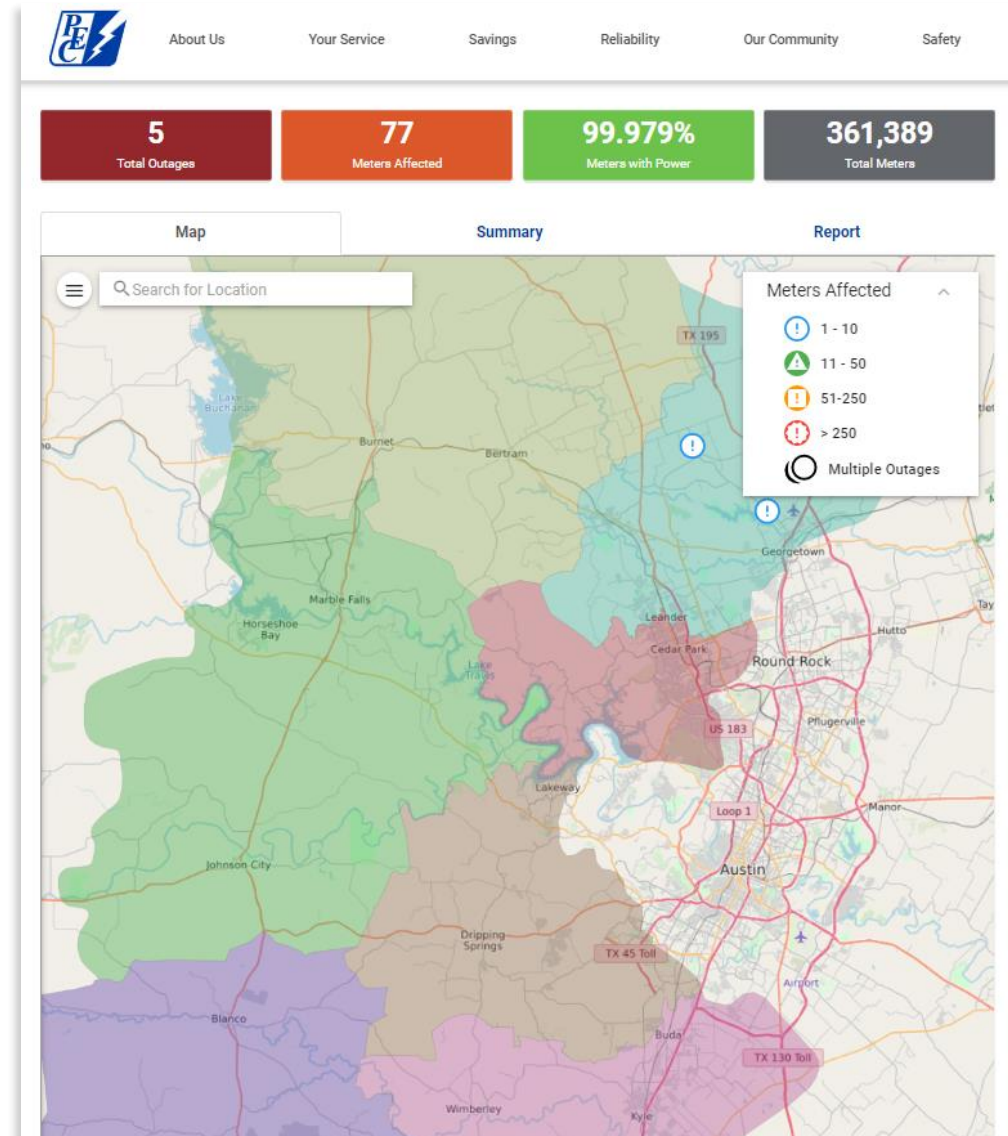
- Reliable outage reporting
- Detailed outage mapping
- Distinguishing between load shed and individual outages
- Systems integration for efficient performance
- Improved coordination with field crews
- Greater situational awareness



Control Center System Upgrades

Additional Features:

- **Updated Outage Map** – Now more reliable and accurate with integration to new OMS system.
- **Treverity Mobile Application** – Provides current situational awareness with operational dashboards for outage and restoration data.
- **Compass Mobile Application** – Provides operational field awareness and options for improved dispatching from the field as crews can identify and queue service requests through the system.



PEC Emergency Preparedness

PEC's Emergency Operations Plan (EOP) is the foundation of emergency response coordination. While EOP drills will test systems and processes, the EOP also contains Action Plans for other areas of coordination that have been under review:

Supply Planning – Logistical contingency planning to support facilities, fleet, and employees.

Employee Emergency Staffing Plan – Internal resources to support member and outage response.

Member Emergency Preparedness – Helping the membership to understand their roles in being prepared.

Vegetation Management – Crews identifying and focusing on problematic areas.

Mutual Assistance – Load shed awareness and transmission outage support.

Communication Plan – Communication from the Emergency Operations Center (EOC) to the membership.

PEC Emergency Preparedness

Several teams acted quickly to support crews and employees working extended shifts, prepare fleet equipment for readiness, and to repair damaged offices. Heavy coordination was required to procure supplies and services, and preparations continue in these areas:

Safety Team

Arranging safe travel for staff to reach nearby offices.

Facility Support

- Pallets of water have been delivered to district offices as “Emergency Use Only.”
- Pre-staging portable toilets at each district.
- Addressed electrical issues necessary to support block heaters in offices.
- Tested and assessed office back-up generators.



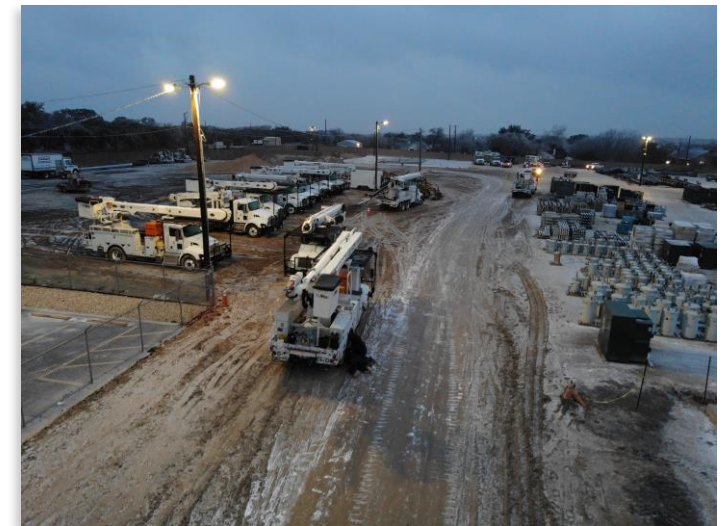
PEC Emergency Preparedness

Fleet

- Approx. 150 sets of tire chains of various sizes have been procured.
- A lease for reserve fuel tanks was contracted into 2022 for six district offices that were without in February.
- Arranging extra fuel deliveries to be available at most district offices.
- Supplies of fuel additives have been ordered.
- Installing block heaters on diesel trucks that were previously without.
- Retaining replacement bucket trucks through winter for potential spare usage.

Operations

Secured reserve materials such as fuses, splices, and transformers.



Emergency Staffing Plan

PEC leadership is revising the emergency operations staffing plan to prepare all PEC employees for another potential call-to-action this winter. Leadership across the cooperative is confirming how and where employees can safely support emergency response efforts through several options:

- Support member escalations and communications.
- Support outage entry and phone queues at nearby offices.
- Support district office logistic by providing employees with food, water, bedding, supplies, etc.
- Support travel arrangements if capable of safely traversing winter road conditions.

In advance of the winter season, it is critical that our employees prepare themselves for another multi-day event similar to February that will require all-hands-on-deck from the entire workforce.

Member Emergency Preparation

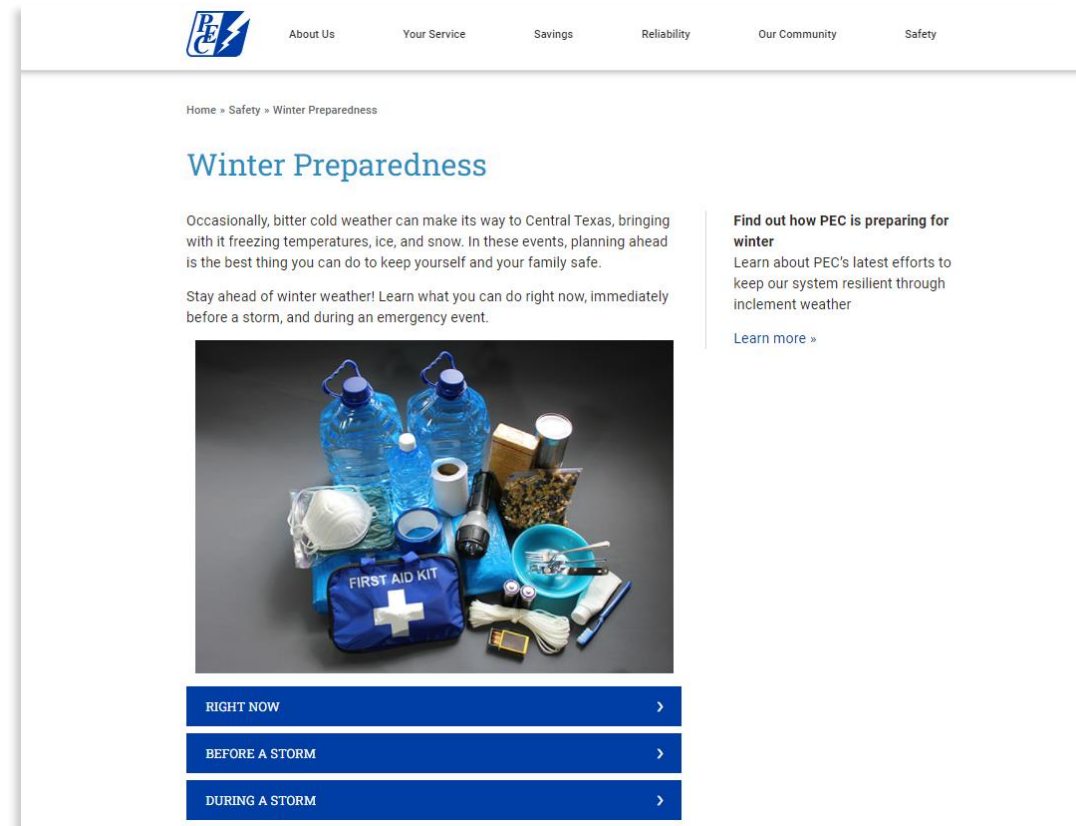
How to Prepare

PEC has provided a web page and a Texas Coop Power article about winter preparedness for members.

The material highlights the preparations PEC has made this year along with what members can do now, before, and during a storm, including:

- Preparing an Emergency Kit.
- Signing up for SMS alerts.
- Downloading PEC's SmartHub app.
- Preparing their home.
- Protecting their home and family.

We encourage all members to visit pec.coop/winter-preparedness to review the suggestions and take necessary actions prior to the winter season.



PEC

About Us Your Service Savings Reliability Our Community Safety

Home » Safety » Winter Preparedness

Winter Preparedness

Occasionally, bitter cold weather can make its way to Central Texas, bringing with it freezing temperatures, ice, and snow. In these events, planning ahead is the best thing you can do to keep yourself and your family safe.

Stay ahead of winter weather! Learn what you can do right now, immediately before a storm, and during an emergency event.

Find out how PEC is preparing for winter
Learn about PEC's latest efforts to keep our system resilient through inclement weather
[Learn more »](#)



RIGHT NOW >

BEFORE A STORM >

DURING A STORM >

Vegetation Management

During the first two days of the storm, iced vegetation was the primary cause of individual outages across the territory. This team has been developing a priority grading system for feeder trimming, that uses industry-leading technology for targeted specific spans of feeders.

2021 Approach - Focusing on C and D rated feeders, the team has cleared vegetation from over 75 feeders to a minimum 10-15 ft. from the primary.

Rating	Vegetation Reach
A	Outside of a 9-foot radius of the primary
B	Within a 9-foot radius of the primary
C	Within a 6-foot radius of the primary
D	Within a 3-foot radius of the primary or overhang

Fall & Winter - As fall vegetation is in a dormant cycle, the team is prioritizing to work all D rated vegetation and critical infrastructure feeders through the end of the year.

Priority	Critical Infrastructure Types
1	Hospitals, assisted living, emergency services
2	PEC facilities, public water and lift stations
3	Stores, restaurants, and hotels
4	Remaining substation feeders without critical load

In August, the team made available a comprehensive presentation for elected officials and city managers to outline the cooperative's tree trimming practices and why trimming is integral to public safety.

Transmission Coordination

Mutual Assistance

Staff from Operations and Engineering have had several meetings with LCRA and AEP to discuss preparedness, EOP drill procedures, and mutual assistance planning:

- Contractor access to substations:
 - Both entities agreed to further assistance for emergency scenarios.
 - LCRA will improve direct access between Emergency Operation Centers.
 - Access will be coordinated on a case-by-case, situational basis.
- PEC is assessing membership with the Texas Mutual Assistance Group (MAG):
 - Become a participating member in the workgroups.
 - Hold conferences twice a year to review industry best practices.
- EOP Drills (Dec 2.):
 - LCRA to participate in table-top exercises.

Emergency Operations Center Communications

Improved Messaging and Updates

PEC's Emergency Operations Plan designates a function and meeting space for an Emergency Operations Center (EOC), or "War Room." During the February event, a few factors impacted the flow of information coming out of the EOC:

- Control Center leadership were continuously and manually managing the frequent, and often substantial, changes in ERCOT load-shed requirements – a total of 58 times and as often as 15 min.
- The duration of the event (3 days) limited the number of available staff capable of managing load shed, outage restorations, and leading updates in the EOC.
- PEC experienced system issues including loss of internet and phone communications.

The Utilicast report addressed these issues through several EOP recommendations, and the Control Center has improved the flow and tools for communications, as well as staffing available in the EOC.

Control Center EOP Drills - Dec. 2nd

Testing Systems:

- Simulated Load Shed Event:
 - Including to similar scale of the winter event.
 - Validate load-shed configuration changes.
- Simulate the loss of system communications.
- Simulate the loss an entire substation from transmission (Fairland, LCRA):
 - Includes participation with LCRA's EOC.
- Localized communications loss of member outage reporting.
- Validate data integrity through new mobile apps for outage dashboards and field crew operations.

Testing Emergency Processes:

- New switching and tagging processes.
- Transfer of operational control to and from districts offices.
- Dispatching of events at the district level.
- Communications Plan for internal and external updates.
- Supply chain issues; transformers, poles, fuel, etc.
- Coordination of crews across offices (service, vegetation, contractor).
- Damage assessment processes.
- EOC shift coverage plans.
- PUC reporting.

Cities & Local Officials Communications

Updating Contact Information:

- New online form shared with officials for updated 24/7 and secondary contact information.
- Expanded contact list: Critical city staff, utility/wastewater officials, emergency services, disaster relief, and nonprofit organizations.
- Key Accounts coordinated contact lists and expanded communications for the Critical Load Registry. Contacts can be added to SMS (text) campaigns, as needed.
- List of officials has been assigned to specific External Relations staff for quicker access and updates.

Improving Coordination:

- Staff are coordinating a proactive outreach to officials and key accounts:
 - Providing an overview of PEC's emergency response procedures, specifically critical infrastructure.
 - Expanded relationships by introducing key PEC staff to key officials (ahead of a crisis).
 - Developing an annual, virtual round-table discussion to provide a refresher on EOP processes.

Member Communications

The post-event assessments pointed to member communications as an area to focus on in future emergency events. PEC has made great strides in acquiring tools and developing timely communications.

Messages During an EOP Event

PEC will use all available methods to provide information to key audiences; website, phone, email, text messages, inbound IVR messages, social media, press releases, and media partnerships to reach the maximum number of members.

Improved Internal Updates

External Relations and the ICT have been working to develop “One Voice” communication flow out of the EOC. Templates will be used to regularly capture operational status and log the progression of restorations during a prolonged event.

Friday, 10/8/2021 8:00 a.m. Update			
COOPERATIVE OVERALL			
Total # of outages (including load shed)		Timestamp	Source
# of true outages (not load shedding)		Timestamp	Source
# of meters with power restored		Timestamp	Source
% of meters currently load shedding		Timestamp	Source
# Crews working in field		Timestamp	Source
Areas with extensive damage		Timestamp	Source
Key talking points for external relations	1.		
	2.		
	3.		
		Timestamp	Source

Improved External Updates

As periodic updates are compiled, they can be easily shared with Operations, Member Relations, and leadership to get messaging, talking points, and critical updates out to members, municipalities, key stakeholders, and the media.

FOR IMMEDIATE RELEASE
October 8, 2021
 Pedernales Electric Cooperative
 Yesterday at 7:52 AM

Press Release

Service interruptions likely due to peak energy demand

JOHNSON CITY, Texas — Due to continued frigid weather across Texas, the regional electric grid is operating under emergency conditions. Utilities statewide, including Pedernales Electric Cooperative (PEC), have been directed to reduce demand. As a result, service interruptions will occur throughout the PEC service territory.

These service interruptions will continue as long as the regional grid operator experiences peak demand. If an interruption occurs in your area, please take proactive steps for power restoration. All electrical appliances affected by the service disruption should be turned off, as well as circuit breakers to major appliances. Once power is restored, members can avoid electrical overload by turning their appliances back on in 15-minute intervals.

PEC will communicate to members when the emergency service interruptions end. Please go to [pec.coop](https://www.pec.coop) for the latest information, and follow PEC on [Facebook](#) and [Twitter](#) for the latest event updates.

PEC crews are working as safely and quickly as possible to restore power across our service area. Rest assured we will not rest until all PEC members have power. Report your outage once via SmartHub or by calling 888-883-3379. More info here: <https://www.pec.coop/news/2021/why-is-my-power-out/>

849 Likes 349 Comments 127 Shares

Member Communication Tools

During the event, PEC did not have a reliable method to quickly and frequently generate system-wide member messaging. Two new bulk messaging tools are now ready for emergency messaging:

Bulk-Email System – Now capable of delivering frequent updates through a cloud-based application that operates without reliance on other communication systems.

Emergency Text Messaging – For members who have a Mobile number registered, they can receive alerts related to ERCOT status and load shed activities.

Digital Resources -The External Relations Team has created several emergency-ready tools to launch during a similar event:

Emergency Info Library – A shared space for internal status updates, FAQs and talking points, and external media center to distribute controlled audio and video messaging.

Alternate Homepages – Ready-to-go, external and internal emergency homepages with pre-loaded material that can go live in a crisis.

PEC's Commitment

Despite all the efforts for preparedness reviewed in this demonstration, PEC members may still experience power outages during a similar storm event.

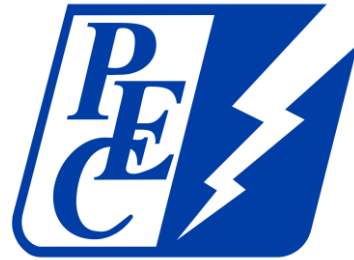
What PEC Can Control

PEC understands our members depend on our services and timely communication. Our responsibility to the membership is also balanced with our responsibility to employee safety.

What PEC Cannot Control

Falling trees, equipment failure, transmission services, and rotating load-shed can cause service outages of any size across the service territory. Despite designations for critical load or medical necessity, any member's service can be disrupted.

PEC personnel will do everything possible to promptly and safely respond to the membership, as well as do everything possible to educate the membership of their need for preparedness for emergency events.



PEDERNALES ELECTRIC COOPERATIVE