



Winter Storm Event

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February 26, 2021

Board Meeting | Open Session

Unprecedented Winter Storm Event

Governor Abbott declared a state of disaster in all 254 Texas counties based on severe winter weather with imminent threat of widespread and severe property damage, injury, and loss of life due to prolonged freezing temperatures, heavy snow, and freezing rain statewide (2/12)

- I. Timeline of critical events
- II. Outage systems and load-shed process
- III. Critical load procedures
- IV. Member communications and relief actions
- V. Overview of action items under review
- VI. PEC facility damage and repairs
- VII. Safety and employee recognition



Overview of EOP Event

- Initial phase of weather event began early morning of 2/12 with freezing temperatures and freezing rain across the service territory
- EOP Level E-2 (Major Event) activated 2/14
- EOP Level downgraded to E-1 (Significant Event) on 2/21
- EOP Level downgraded to Recovery on 2/23, where we remain today
- Event lasted a week – Austin reported **165 consecutive hours** of below freezing temperatures (**6 days, 20 hours**)



Pre-Event Preparations

- PEC prepared for the weather event as the forecast developed
 - 2/10 – Weekend Weather Operations Readiness call in preparation of event; Leadership started cooperative-wide preparations; Vegetation management contacted all contractors for available crews and shared with Control Center and RSOCs
 - 2/11 – PEC website updated with inclement weather preparation; Crews were strategically positioned at each district waiting to be dispatched; Freezing conditions began that night
 - 2/12 – Began restoring outages primarily from frozen vegetation in contact with lines; Scheduling 24-hour staffing to key areas allowing us to work around the clock; Secured 3 more vegetation management crews, bringing total to 42 for the event; Began scheduling EOP meetings and other readiness calls occurred several times a day for the next week

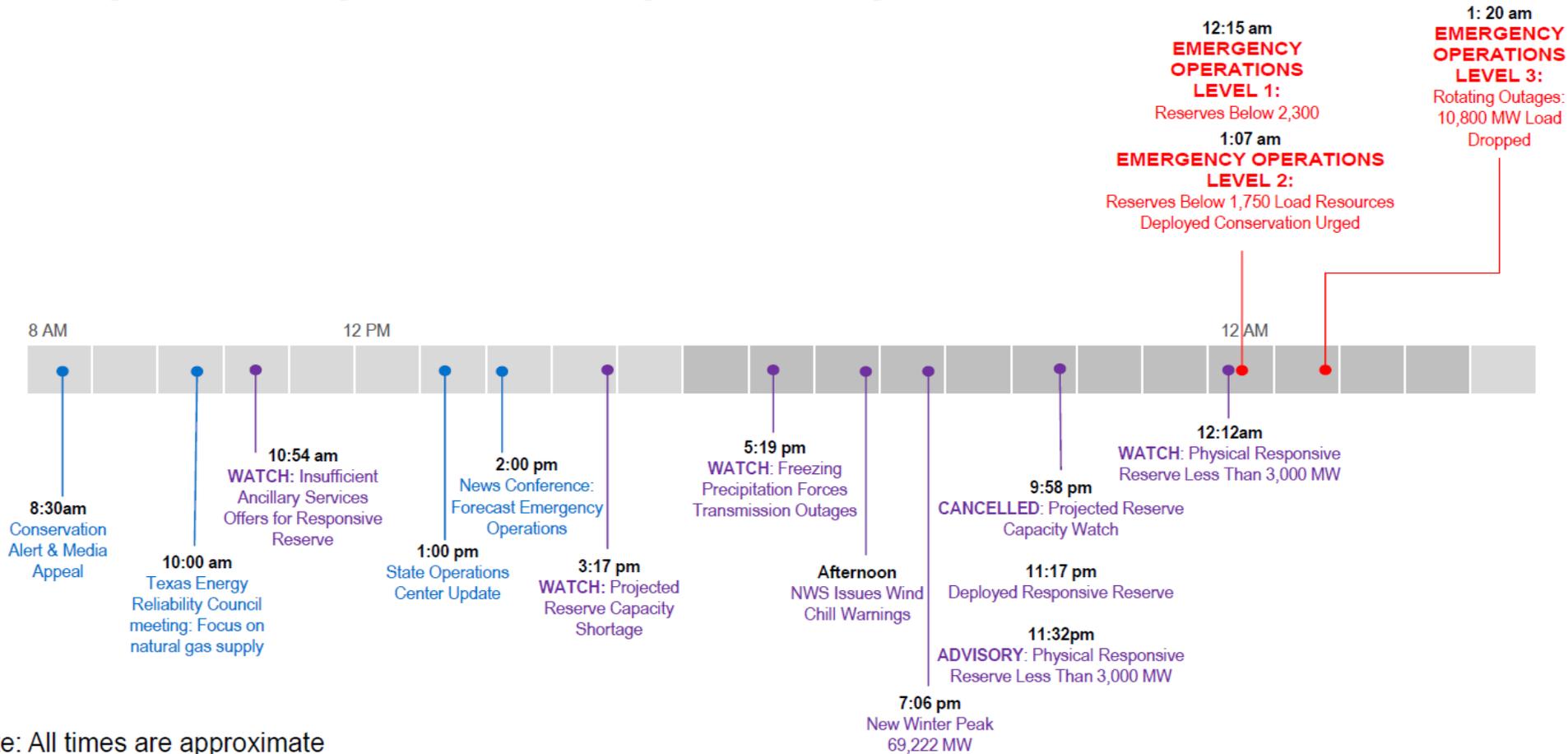
Pre-Event Preparations



- 2/13 – Continued restoring isolated outages from frozen vegetation in contact with lines; Sent all-member email on conservation and energy/cost savings and coordinated messaging for load-shed event
- 2/14 – Activated EOP; Continued preparations for event and possible load shed; All-member email sent on reducing energy use; Incident Command Team met at 7 pm to discuss EOP operations; Monitored ERCOT grid conditions

ERCOT Timeline

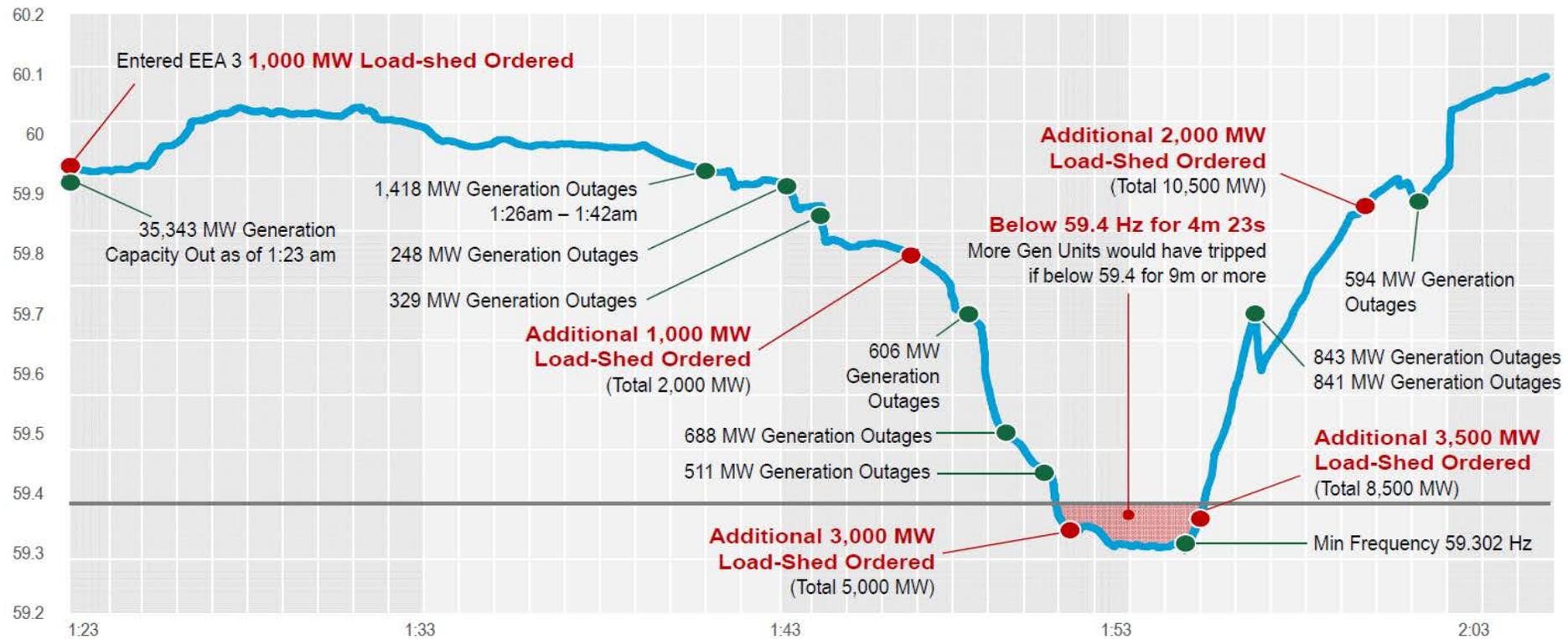
Sunday, February 14 – Monday, February 15



Note: All times are approximate

ERCOT Frequency Drop

Rapid Decrease in Generation Causes Frequency Drop



Monday – 2/15

- PEC required to shed load for EEA 3
 - LCRA TSC dispatched the first 1000 MW ERCOT obligation at approximately 1:23 am, which translates to 20.68 MW or ~2.068% for PEC
 - ERCOT modified the obligation in response to system changes 20 times on Monday (58 times for the total EEA 3 period), at times changing every 15 minutes
 - The maximum obligations (20000 MW for ERCOT and 413.65 MWs for PEC) occurred on Monday at 6:44 pm (for comparison, PEC's entire load this past Wednesday, 2/24 at 7:00 am, was 556.5 MWs)
 - Automated load-shed program did not properly function at higher levels, so had to use manual load-shed procedures
 - PEC rotated 153 feeders across its service territory to meet requirements, causing members to be out of service from ~20 minutes to several hours at a time, depending on obligation size
- Simultaneously with rotating load shed, members continued to experience outages due to damaged infrastructure and winter weather

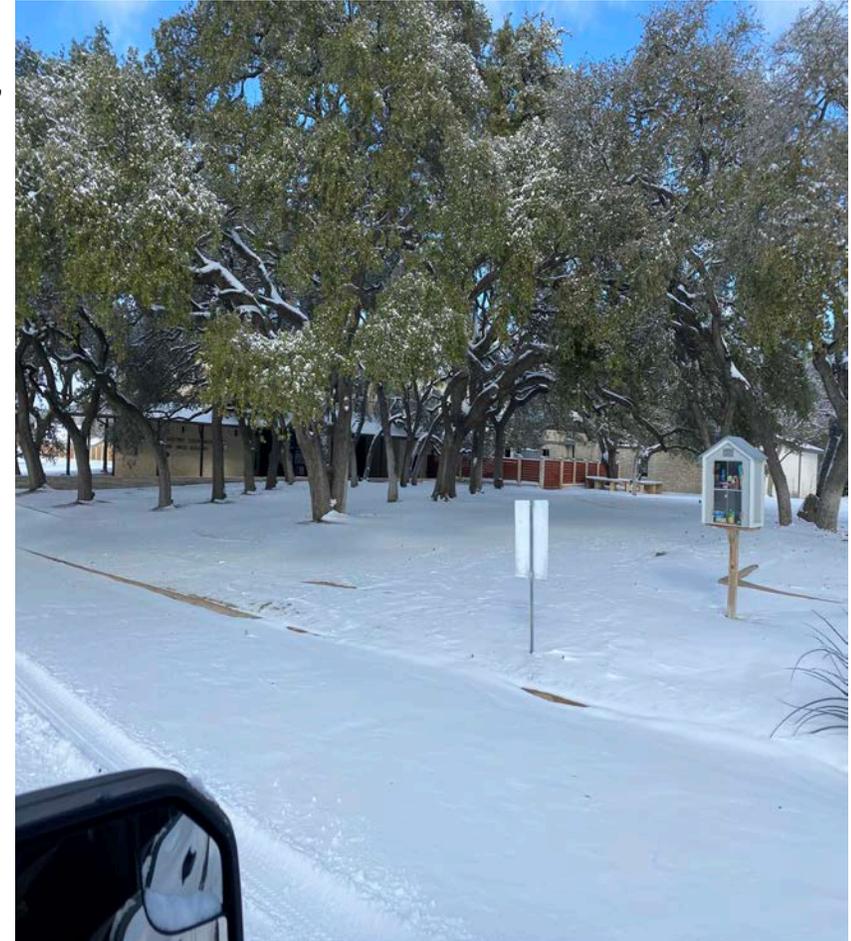
Monday – 2/15

- PEC sent emails to registered Critical Loads at 1:28 am
- PEC sent all-member email regarding service interruptions at 2:30 am
- Began outbound calls to members at 6:00 am, but was taking extremely long times to execute (1600 calls/hr) and slowing down other phone and computer systems so had to discontinue at 6:45 am



Monday – 2/15

- PEC began experiencing system issues, including loss of internet, SmartHub, and phone connections on Monday morning
 - Communications link to the back-up control and data center went down for ~2.5 hours
 - Communications and internet outages impacted Marble Falls and Headquarters locations
 - IT personnel responsible for resolving the problem also lost power and internet at their homes, improvised with cell service and car batteries as power sources to redirect communication links
 - Due to system limitations, all-member emails required 5+ hours to send



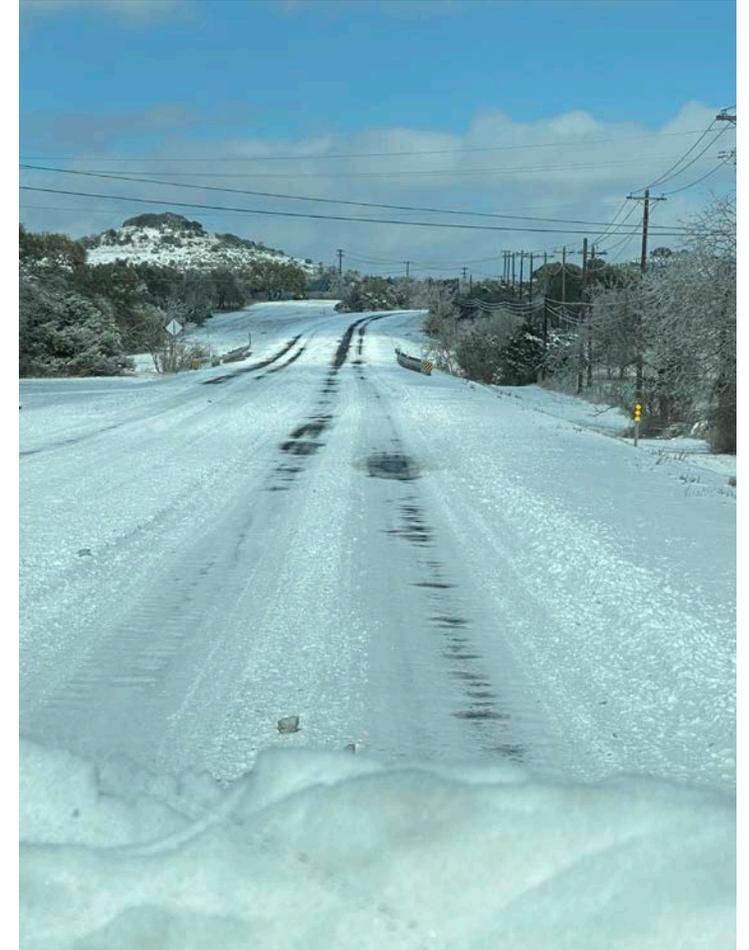
Monday – 2/15



- Members were reporting outages caused by both the ERCOT load-shed interruptions as well as outages caused by the winter weather, which caused an extremely large increase in reported outages
- Overwhelming outage increase resulted in an incorrect outage map
- Icy conditions Monday night required PEC crews to stop restoration efforts; Contractors also pulled their crews for restoration efforts

Tuesday – 2/16

- Required load shed continues, maximum PEC obligation 403 MW at 7:58 am
- PEC removed the outage map from the website and focused on providing members with timely and accurate information by email, PEC's website, and social media
- Formed internal task force to address outage concerns and how to distinguish cause
 - Also handled incoming outage calls with control center and worked to address extended outages and outages on critical infrastructure
- PEC sent all-member email regarding service interruptions with FAQs



Wednesday – 2/17



- PEC required load shed for EEA Level 3 continues
 - Developed consistent rotation schedule to allow longer durations of power and anticipate rotations
 - Returned to automated load-shed program
- Controlled restoration to maintain grid stability required crews to wait to re-energize lines after repairs so demand could be reduced on another portion of the system to ensure staying under or within the reductions required by ERCOT
- Internal staff task force proactively identified and protected critical infrastructure locations not registered with Critical Load Program
- All-member email sent regarding update on power restoration and PEC’s service interruption schedule, with link to Community Resources on pec.coop and additional FAQs
- ERCOT ends EEA Level 3 at 11:55 pm

Thursday – 2/18

- Restoration efforts become more efficient with end of load-shed activities
- Junction and Oak Hill had the most outages
- Staff around the cooperative volunteered to support Member Relations with responding to members
 - Safety Team arranged escorting staff to offices
- Oak Hill, Dripping Springs, and Junction offices sustained damages from freezing pipes, and repairs scheduled for damaged facilities
- Requested additional fuel and water supplies for crews



Post Event Through 2/23



Friday – 2/19

- Temperatures returned to above freezing for the first time in a week
- Melting ice caused additional issues with equipment failures and muddy conditions
- Most Eastern districts now managing outages with regularly scheduled crews, and begin to prepare for sharing resources with Junction and Oak Hill

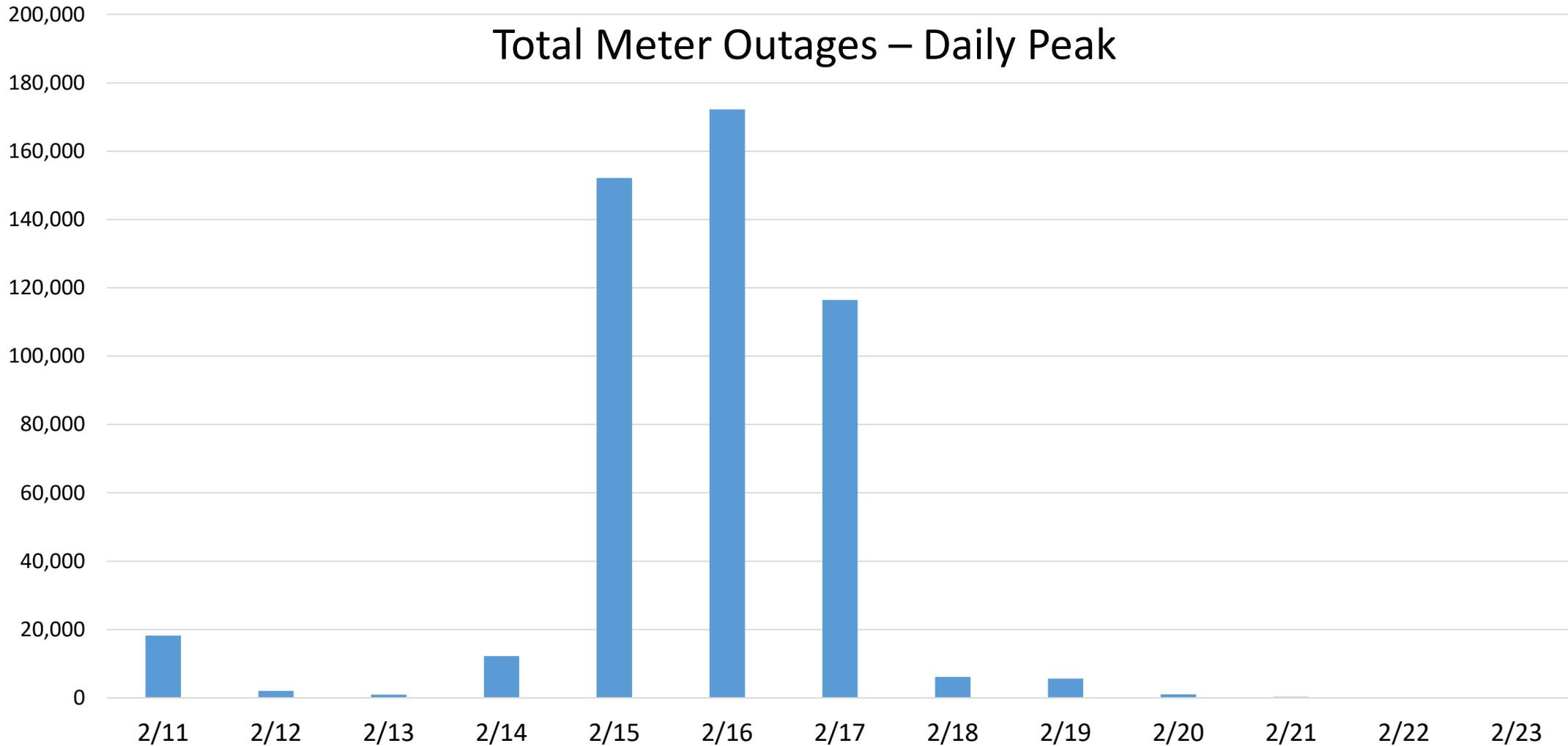
Saturday through Tuesday – 2/20 and 2/23

- Junction battling muddy conditions to restore remaining outages in remote locations
- All available crews sent to Junction, with 12 UAVs that flew 350 miles of line
- Service restored to last member in Junction on 2/23

PEC Meter Outage System

- Automated outage system uses system data and member outage reports to predict the number of outages
- When winter event began and ERCOT ordered rotating service interruptions, members reported outages caused by both the ERCOT service interruptions as well as outages caused by the winter weather, which caused an extremely large increase in reported outages and impacted the outage map
- PEC removed the outage map on 2/16 so we could provide members with timely and accurate information by other means, and members were directed to call or visit SmartHub to report outages
- Internal staff task force mobilized on Monday to segregate regular outages versus load-shedding outages, and to address long duration load-shed outages; worked around the clock
- PEC reported outage numbers three times a day to the Public Utility Commission of Texas

Meter Outages During Event



Historic Winter Peak Demand

ERCOT WINTER PEAKS

Year	Peak Demand (MW)	Date & Time	Year-Over-Year Increase
2021	69,420	2/14/21 19:00	23%
2020	56,503	2/6/20 7:15	-1%
2019	56,827	11/13/19 7:00	-14%
2018	66,068	1/17/18 7:15	

PEC WINTER PEAKS

Peak Demand (MW)	Date & Time	Year-Over-Year Increase
1,993	2/12/21 19:45	42%
1,403	2/6/20 7:30	5%
1,332	11/12/19 8:45	-23%
1,738	1/17/18 6:30	

PEC Load-Shed Obligations

- Load-shed requirements in ERCOT Nodal Operating Guidelines, Section 4.5.3.4
- PEC met required demand reductions by interrupting service to different distribution feeders across PEC's system for limited periods of time, "rotating" interruptions among members
- When power was restored to one set of distribution feeders, PEC then had to interrupt service on a different set of feeders to ensure the required level of reduced demand
- Length of rotations depend on how much demand PEC was required to interrupt, and this amount changed up and down as grid conditions changed
- Larger demand reduction amounts could only be done at the distribution feeder level by PEC because we do not have the ability to turn off a limited number of members on a feeder
- All available feeders on PEC's system are included on the list for potential rotating service interruptions, but some feeders may include members on the Critical Load Program registry and rotate as little as possible

PEC Load-Shedding Feeders

Critical Load Feeders

- On 2/15 there were 153 feeders out of 281 in the load-shed cycle as load shedding began
- By 2/17 the number of load-shed feeders had been reduced to 109 feeders, primarily to reflect additional critical infrastructure and those taken out for construction and repairs

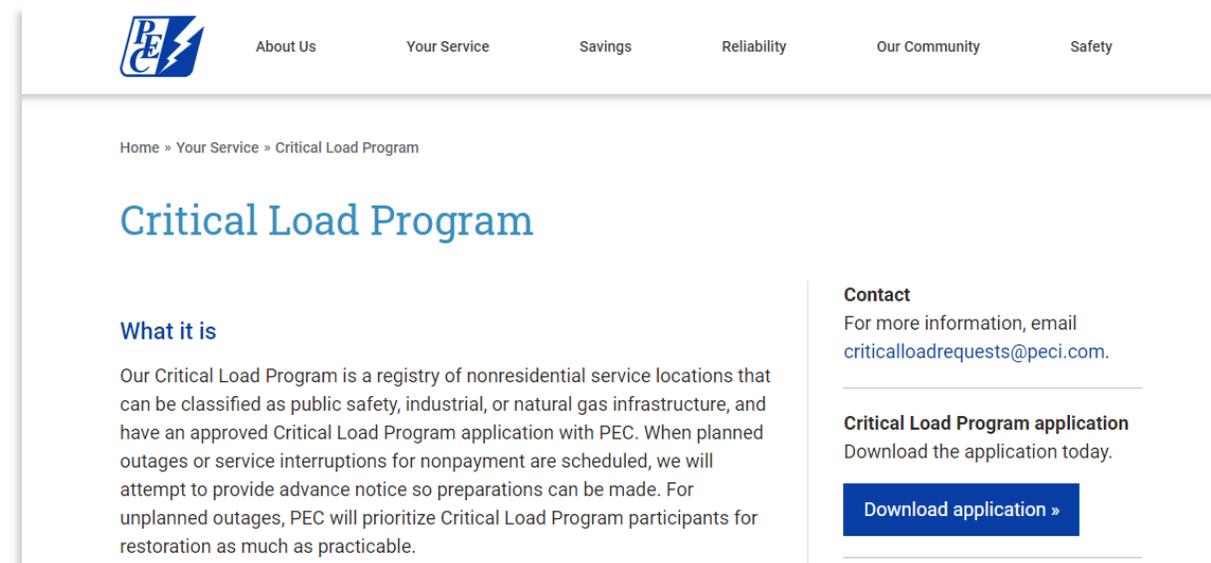
Under Frequency Load-Shed (UFLS) Feeders

- PEC has 74 UFLS feeders not part of the rotational load shedding to protect another aspect of grid stability
- If the system gets to a point where frequency is dropping, PEC is obligated to drop load in 3 steps for up to 25% of total load
- PEC can not rotate UFLS feeders in load shed, because they would then be unavailable to automatically drop when needed to protect the system
- Requirements in ERCOT Nodal Operating Guide, Section 2.6.1., states that whenever possible, Distribution Service Providers shall not manually drop load connected to UFLS during implementation of E-3 EEA



PEC's Critical Load Program

- PEC's registry of nonresidential service locations includes infrastructure for:
 - Public safety (hospitals, water sites)
 - Industrial
 - Natural gas
- The application process:
 - Is voluntary and maintained with the EOP
 - Uses the PUCT rules as a guidance
 - Program information is on PEC's website
 - Bi-annually staff reviews applications and may designate a "Do Not Shed" or a "Priority" in restoration
- The 2020-21 list contains 24 various sites:
 - 17 applicants were given "Do Not Shed" priority
 - 7 applicants were given "Priority" status
- Despite Critical Load list, PEC cannot guarantee uninterrupted power at all times



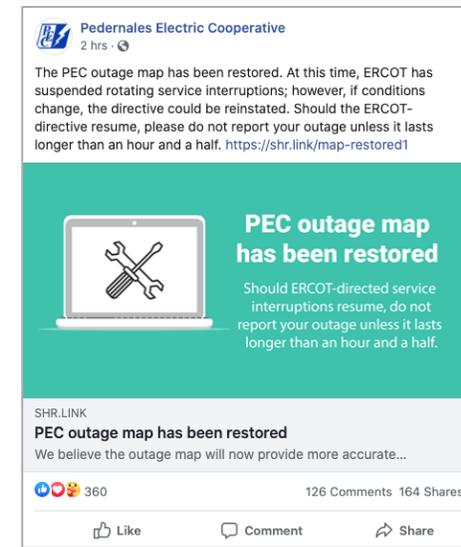
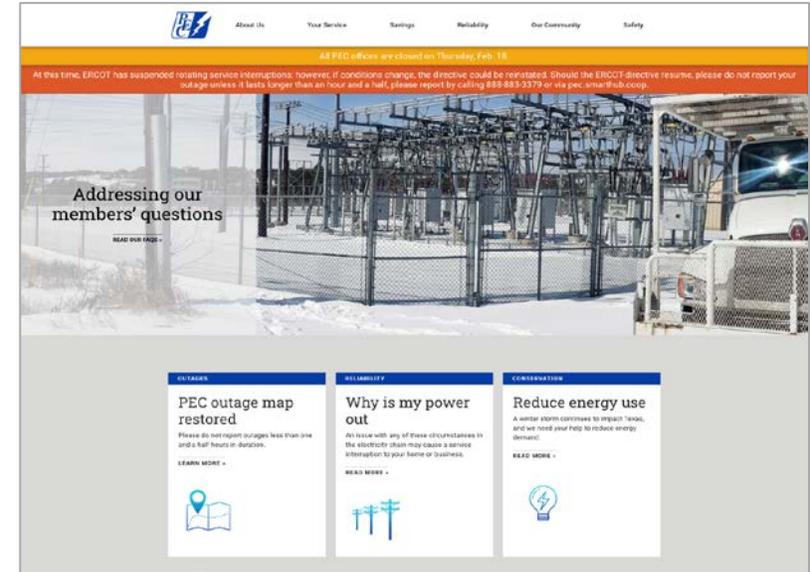
Member Outage Communications Issues

Outage Communications System has significant limitation

- Outage Map – temporarily taken down
- SmartHub - designed as a tool to help manage monthly consumption, but estimates usage if unable to capture energy consumption which can be inaccurate due to winter storm event; separate from billing system which is based on actual usage

Member Relations agents had limited access to phone systems due to weather

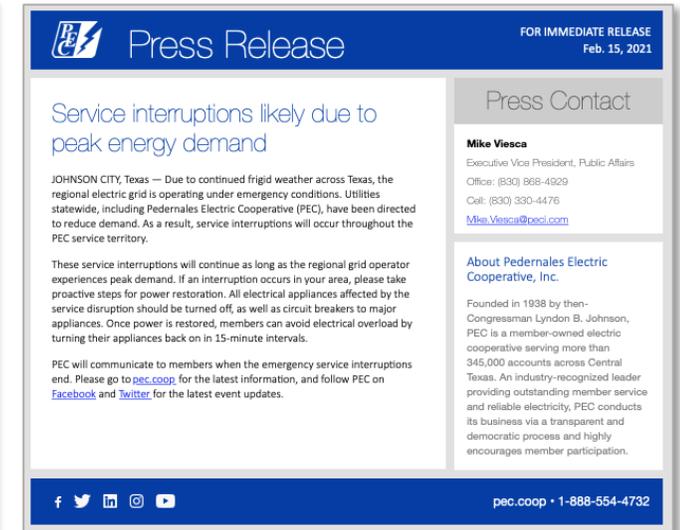
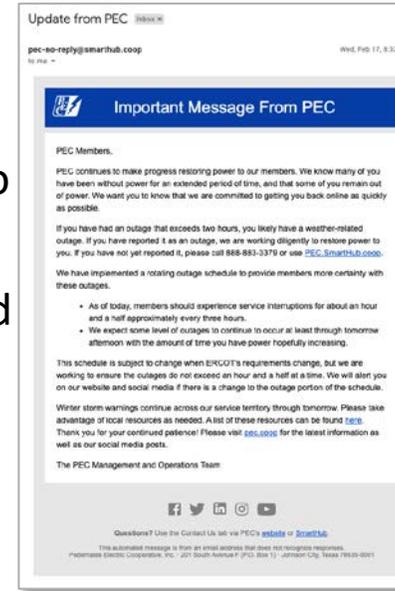
- Required to stay in hotels to be close to offices



Member Informational Communications

Mass Member Communications (email, website, social media)

- 7 all-member emails sent 2/13 – 2/19
 - System limitations caused executing all-member emails to take ~5.5 hours to process
 - IT created new process to assist email system on 2/17 and reduced execution time to ~2.5 hours
- Press releases issued and media inquiries addressed throughout the week
- Social Media messaging mirrored the information on the website.
 - Facebook – 46 posts, with 50K engagements (24K followers)
 - Twitter – 60 posts, with 3.3K engagements (11K followers)
 - Instagram – 25 posts, with 1.6K engagements (1.6K followers)
 - LinkedIn – 30 posts, with 732 engagements (8.1K followers)



Actions Pursuant to Tariff and Business Rules

- Waiver of fees from 2/22 – 3/12 for residential members affected by the winter storm in the event members may need to relocate for repairs or damage to their current residence or for new applicants into the PEC territory (Section 300.5)
 - Deposits for residential service (Section 300.7.5; generally range \$75 - \$150 for residential accounts)
 - Establishment fee (Section 500.4; \$75)
 - Same day service fee (Section 500.4; \$250)
- Waivers of late payment fees for residential and non-residential service bills from 2/14 – 3/12
 - Section 300.11.4 and Section 500.4; \$20.00
- Suspension of disconnection from 2/14 – 3/12
 - Section 300.9.20.2.1

Damages

- Members encouraged to file claims with their homeowners' or renters' insurance carriers
- Members should visit our [Community Resources page](#). This page includes links to [FEMA](#) and the [Texas Division of Emergency Management](#).

Overview of Preliminary After-Action Review

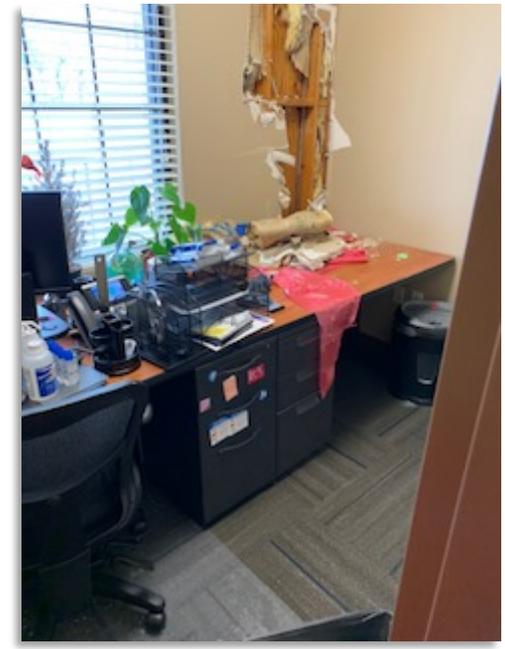
Lessons Learned and Areas for Improvements:

- Address Critical Load List and Outage Communications
 - Improve outage communications and management of member escalations and restoration updates
 - Re-examine load-shedding program to clearly identify priority levels and communications
 - Strengthen Operations relationship and communications to cities and public officials
- Address Systems Limitations
 - Assess Outage Management System (OMS) and ability to segment load-shed outages, including options with Aclara metering
 - Resolve system limitations with mass communications (calls, emails, texts)
- Strengthen Coordination
 - Strengthen Control Center coordination with District Operations

Conduct After-Action Review by each department beginning next week

Facility Damage and Repairs

- All offices had at least minor issues, ranging from gate repair to kitchen cabinetry removal
- Major damages from burst water pipes occurred in Oak Hill, Dripping Springs, and Junction
- Dripping Springs 100% flooded including damage to sheet rock and insulation
- Oak Hill water leak caused kitchen cabinetry and appliances to be removed to replace sheet rock and insulation



Safety in the Field

- Through the event, the Safety Technical Training team reinforced safety guidelines and supported escorting employees to offices through hazardous conditions
- In total, 14 vehicle incidents occurred during the ice storm
 - All were minor, ranging from broken mirrors, windshields, and bumpers typically due to sliding off road or debris from falling ice or tree branches
 - No injuries from vehicle incidents
- One minor employee injury when sawdust was thrown into their eye when clearing lines, the employee was immediately taken to a clinic and the debris was safely flushed out
- **Overall, considering the extremely hazardous events, all staff did a great job to perform their jobs safely**

PEC Strong

Our employees deserve so much applause for the dedication shown over the last two weeks. Here are a few examples of why we are so PEC Proud:

- We called for volunteers during the storm to report to a nearby office and support member phone calls to locate outages - all available staff stepped up to help members!
- Our Safety team escorted staff in four-wheel drive vehicles so they could safely reach offices.
- Our facilities team kept our facilities clean and running, delivered meals and water to offices, and provided inflatable mattresses and other accommodations where needed. They also immediately coordinating repairs and cleanup up after flooding.
- Even through a grueling week of harsh situations, PEC's membership has shown appreciation in many forms for our entire staff's efforts to power their homes and businesses.

Lineworker Appreciation

Our lineworkers worked tirelessly throughout this 13-day event!

