



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners McRae, Barofsky, Schlossberg, Brown, and Carlson

FROM: Frank Lawson, General Manager; Rod Price, Assistant General Manager; Karen Kelley, Chief Operations Officer; Tyler Nice, Electric Operations Manager

DATE: March 22, 2024

SUBJECT: 2024 January Ice Storm – After Action Report

OBJECTIVE: Information

Issue

Communicate impact data, lessons learned, and recommendations for improvement concerning the 2024 Ice Storm response via a published After-Action Report.

Background

The 2024 January Ice Storm resulted in widespread damage to EWEB’s service territory effecting approximately 38,000 customers with preliminary repair costs of over \$8M and additional repairs to transmission lines required following bulk restoration. In addition to electrical outages to customers, and significant community impact, other EWEB services were severely impacted including Generation, Communications and Water.

Per Incident Command System (ICS) and FEMA best practices, a valuable part of the closeout process for major events, such as this storm, is to discuss lessons learned with all staff involved, document things that went well, and those that need improvement. These findings drive and ultimately create an action plan to improve processes, training and resource needs before the next event occurs. This is completed through a series of “Hot Washes” where each section of the ICS structure shares findings. EWEB staff have completed this effort and have produced an After-Action Report with an overall summary of the event, pertinent data, and action items.

Discussion

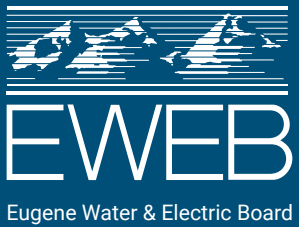
This report is attached for the Commissioners information, interest and awareness around the focus and priority of work moving forward to improve EWEB’s response to major events. The report will be made available to the entire organization and the public. It will be used as an overall guideline of improvement projects concerning ICS improvements.

Recommendation

Staff will be happy to discuss high level findings, data and recommendations as well as field comments and questions from Commissioners at the April Board meeting.

Requested Board Action

None at this time. This is for information only.



After Action Report

JANUARY 2024 ICE STORM



Report Contents



EXECUTIVE SUMMARY & EVENT OVERVIEW



RESTORATION PERFORMANCE



REFLECTIONS FROM PAST STORMS



CONCLUSIONS & RECOMMENDATIONS

- Executive Summary
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Executive Summary

This report summarizes the Eugene Water & Electric Board's (EWEB) performance in response to the January 2024 Ice Storm and the impacts of the storm, both to the community and EWEB's electrical infrastructure.

A heavy accumulation of ice in the middle of January 2024 caused devastating damage throughout EWEB's service territory. The storm resulted in power outages, affecting more than 38,000 electric services, primarily homes and businesses. EWEB's territory has a population of about 180,000, with 95,000 electric services.

The cost of the restoration effort totaled more than \$8 million (not including two transmission line rebuilds required following the completion of customer restorations). Given the likelihood of a presidential declaration of emergency, EWEB is prepared to apply for reimbursement from the Federal Emergency Management Agency (FEMA) to recover a portion of the cost.

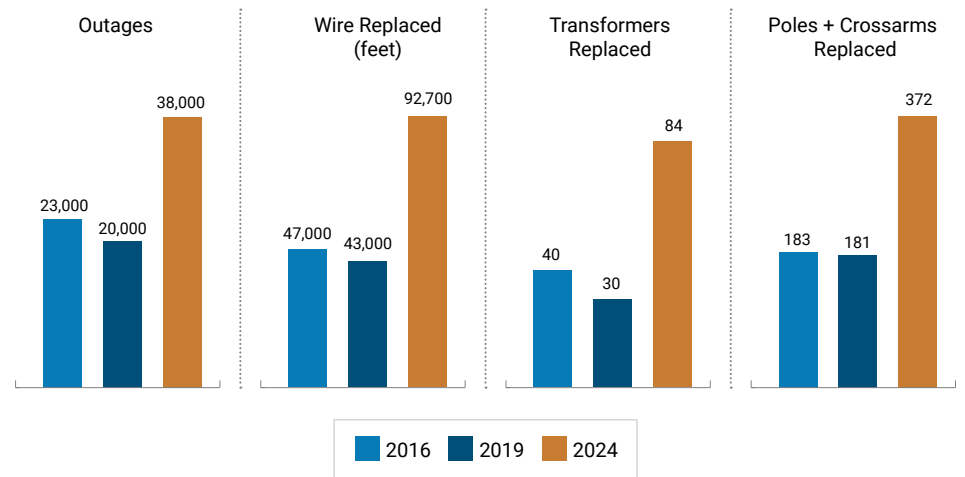
Following the 2016 Ice Storm, EWEB has focused on emergency preparedness and disaster recovery as a strategic priority, with emphasis on enhancing customer trust and confidence in EWEB during disruptive events, such as a large storm. Changes to EWEB's restoration procedures following widespread outages have centered on improving the flow of internal communication, paving the way for efficiency gains in the restoration process, as well as providing customers with relevant and timely information through a public-facing outage map, news, and social media releases.

Building on the lessons learned from the 2016 Ice Storm, the 2019 Snow Storm, and with the utility's continued focus on emergency preparedness and disaster recovery, **EWEB was able to restore approximately 97% of customers within seven days with a similar**

number of crews as in 2019 and fewer than half the field crews dispatched in the 2016 storm.

The January 2024 Ice Storm provided another opportunity to implement those processes and procedures and with new employees, which EWEB will continue to evaluate and refine in the pursuit of delivering exceptional customer service during emergency situations.

DAMAGE COMPARISON



	2016	2019	2024
Days in ICS	9	9	17
Number of Line/Tree Crews	32/14	15/10	17/11
EWEB Staff	200	300	305
Injuries/Number of Recordables	5/1	6/0	11/1
Estimated Cost (millions)	\$4.2	\$3.5	\$8

Event Overview

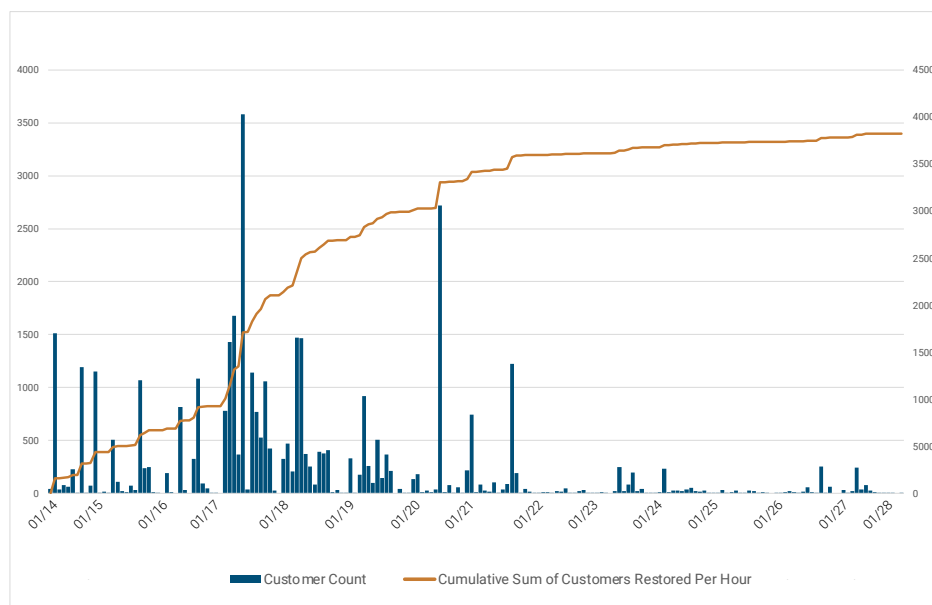
The EWEB service territory experienced widespread power outages due to uncharacteristic snowfall and ice accumulation starting in the evening of Jan. 13, 2024. While freezing temperatures held steady, a second freezing rain storm hit EWEB service territory on Jan. 16, 2024. **The back-to-back storms contributed to devastating damage across the region, including blocked roads and downed lines due to fallen trees.**

EWEB restored 38,000 service outages between the two storms. The majority of outages were due to tree contact with high-voltage lines, automatically tripping off power to homes and businesses and damaging transformers and poles extensively. Power was restored to the majority of customers within nine days of the second storm.

In preparation for the storms, EWEB activated the Incident Command System (ICS) on Thursday, Jan. 11, 2024, after the National Weather Service predicted 1-6 inches of snow, moving to freezing rain and ice accumulation up to a quarter of an inch in the Willamette Valley and 2-4 feet of snow in the Cascades. General Manager Frank Lawson signed an emergency declaration on Sunday, Jan. 14.

In total, 359 field and office staff participated in the ICS emergency response, including 54 contracted linemen. Approximately 29,000 labor hours were billed. Damage from the storm resulted in approximately \$8 million in restoration costs (parts, materials, staff time and contracted labor).

COUNTS OF ELECTRIC CUSTOMERS RESTORED PER HOUR AND CUMULATIVE CUSTOMERS RESTORED BETWEEN JAN. 14 AND JAN. 28



Other Service Impacts

In addition to widespread customer electrical outages, the Ice Storm disrupted EWEB's generation, communications, water treatment, and water distribution systems. Maintaining operations in these areas took significant staff time and effort to ensure risks were mitigated to the extent possible and service disruptions were minimized.

GENERATION

EWEB's Walterville and Leaburg projects were without power at the storm's onset. Emergency generators were deployed at Leaburg Dam, Leaburg Plant, and Walterville Plant to maintain critical systems used for communication, monitoring, and water flow. Both plants' project office and housing were without power for multiple days. Small portable emergency generators were procured during the storm to keep domestic water and lights on at the homes that house operators. Operations staff used an emergency generator to manage the project's canal levels and water flow.



Communications were lost at the Walterville and Leaburg Plants for about 28 hours, which resulted in the need for 24/7 presence by Operations Staff to maintain and monitor critical systems. Under an ICS activation, the Communications Shop made a temporary repair off Camp Creek Road to restore communications taken down by trees.

Carmen Smith was tripped off early in the storm due to tree-related outages on the transmission line. No significant operational impacts were experienced while the plant was supplying its own power and disconnected from the power grid. In all, the outages resulted in \$4.3 million in lost generation during the storm.

COMMUNICATIONS

For the duration of the storm, the Communications and Controls team worked to support radio towers, fiber, and microwave communications systems critical to EWEB's operation, along with the regional radio system for our partners at LRIG. This work included fueling generators at Blanton Heights and other communication sites when the power supply was interrupted.



There was significant damage to the fiber system managed by our neighboring utility, the Springfield Utility Board (SUB), which impacted our ability to communicate with our facilities on the east side of our service area. The team developed novel solutions utilizing temporary wireless links to bypass damaged fiber and establish communications to the Thurston and Hayden Bridge substations. As poles were repaired the team worked with line crews to splice and re-establish damaged fiber communication lines and also offered assistance to our regional partners.

WATER TREATMENT

EWEB's Hayden Bridge Water Filtration Plant lost all utility power on three separate occasions between Jan. 14 and Jan. 18. The outages required the plant to switch to an emergency backup generator system. Plant staff managed the outages via emergency procedures and increased awareness and response to maintain water production. Refueling the diesel generator became a crucial component to operation during this time. EWEB's fleet provided refueling when the contracted vendor was unable to deliver fuel due to the extent of icing on roadways.



In the early days of the storm, heavy ice accumulation complicated the operation of the plant's lower gate, upper gate, intake gate, sweep valves, and influent gates to some filters. Operators exercised the gates to prevent sticking and completed manual intervention for equipment that had been locked up by ice.

Warming temperatures helped gate and valve issues but brought other challenges, with falling trees causing outages, blocking roads, and making the lower gate inoperable. EWEB installed a temporary fix to allow for the manual operation of the lower gate and scheduled full restoration following the storm.

WATER DISTRIBUTION

In the days prior to the storm, Water Staff increased system reservoir levels to cover an additional three days of demand, then continued adding water as Hayden Bridge capacity allowed. Reservoir levels were maintained in several parts of the South Eugene system throughout power outages. This included impacts to Shasta, Dillard, Fairmont, and City View where available water was used to balance the system, and portable generators provided temporary power to pump stations.



Manual and frequent monitoring was performed at additional pump stations and reservoirs to ensure supply. One station lost power momentarily and EWEB issued a boil water notice to six customers. It was lifted 24 hours later after water samples tested normal. Nine main breaks were experienced over the course of the Ice Storm and were assumed to be due to the freezing weather. This was generally across the system with 8", 6" and 2" mains affected.

Days 1-3 (Jan. 13-15): Initial Storm Outages

Isolated outages began Saturday, Jan. 13, with approximately 2,100 customers losing power in the upriver service territory, primarily east of Thurston (Hayden Bridge feeder 2406, Holden Creek-Carmen Line, and Waltherville 12kV). At approximately 0906, the 115kV feed from Holden Creek Substation to Carmen Substation tripped due to a fault, resulting in an outage to Blue River customers, the Army Corps of Engineers Cougar Power Plant and EWEB's Carmen-Smith Hydroelectric Project. This line remained out of service for six days due to restricted access and the impending second Ice Storm which created further hazardous conditions. EWEB's Carmen-Smith Hydroelectric Project went offline and was islanding. The freezing temperatures continued to hold over the next two days. Numerous tree limbs came into contact with cable and secondary lines were damaged from falling trees.

On Sunday, Jan. 14, approximately 3,500 customers were out of power. In addition to upriver outages, dozens of scattered outages were reported in town, with a large one (1,200 customers) at the Hilyard substation. EWEB troubleshooters and crews were able to begin the hierarchy of repair, making safe and maintaining critical response while continuing to make progress on customer restorations.

On Monday, Jan. 15, approximately 5,100 customers were without power. Upriver, transmission lines were still down. Conditions remained too hazardous to travel there and even assess the damage, and downed trees resulted in unpassable roads. So, crews continued to make progress in town. In the meantime, staff prepared for upriver restoration work by procuring resources (poles, transformers, wires, etc.), onboarding contract crews, and developing an upriver staging area for efficient deployment. The weather forecast called for a second storm of freezing rain on Tuesday, with temperatures warming in the afternoon.



ACTIVITIES ACCOMPLISHED

- **Thursday, Jan. 11:** ICS Activated
- **Saturday, Jan. 13:** Carmen air switch freed for operation
- **Sunday, Jan. 14:** 1,947 services restored
- **Monday, Jan. 15:** 4,477 services restored

MAKE SAFE STAGE: During the first few days of the back-to-back storms, crews primarily focused on making electrical facilities safe and de-energizing and removing downed wire rather than on restoration of power. This reduced risk to the public of electrical contact and increased access allowing for assessments and the necessary repairs to follow. Downed wire reports came in from the general public, assessment crews and local agencies. During this time, the Liaison office coordinated with Lane County area public entities, including police and fire, to gather additional reports of downed wires.

Days 4-6 (Jan. 16-18): Outages Peak After Second Storm

As forecasted, the freezing rain caused another significant round of outages overnight. While EWEB worked to restore power for thousands of customers over the past few days, the damage sustained in the last 24 hours was a setback for the progress previously made. **Power outages peaked at 24,000 on Wednesday morning.**

From Wednesday on, temperatures rose above freezing and the ice began to melt. Road and safety conditions improved. All six EWEB Crews and five contract crews begin restoration following the hierarchy of repair, focusing on transmission line restoration and clearing unsafe conditions.

Hayden Bridge lost service again and was operating on diesel backup generation. Crews continued to dispatch fuel to both that facility and to the lower McKenzie River dams that were still operating on backup power. Wednesday evening, the Carmen line was cleared and ready for connection to BPA, with the site running on station service from the Carmen units.

At the start of each day, all crews gathered for a safety and strategy briefing that focused on current hazards and confirmed restoration strategy. Crews worked a consistent shift of 16 hours on and 8 hours off and were dispatched daily by 0700 with work packets to determine the day's scope of work. In the initial days after the second storm, crew efforts focused on restoring outages in the metro Eugene area while upriver customers were advised it could take up to a week before they saw power restored due to transmission line outages and accessibility constraints.

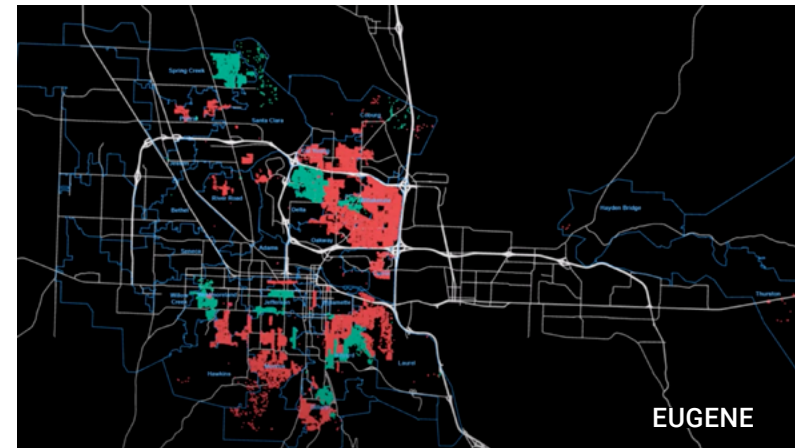
FOCUS ON SAFETY

Throughout the event, safety was a top priority. Safety staff observed work in the field to confirm staff personal protective equipment usage, staff wellness and conducted hazard assessments resulting in additional safety recommendations. From Jan. 13 to Jan. 27, 36 safety incidents were reported. Of those, five pertained to mutual aid partners/contractors. Nearly all these incidents were related to working conditions associated with snow and ice (such as slips and falls).

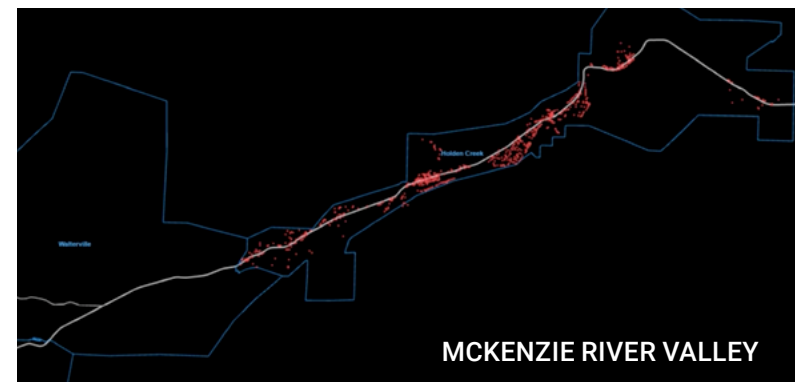
ACTIVITIES ACCOMPLISHED

- **Tuesday, Jan. 16:** 2,837 services restored
- **Wednesday, Jan. 17:** 11,809 services restored
- **Thursday, Jan. 18:** 5,836 services restored

OUTAGES AND RESTORATIONS AS OF 1:05 A.M. ON WEDNESDAY, JAN. 17, 2024



■ Outages ■ Restorations



[Watch a timelapse video of the storm event.](#)

Days 7-11 (Jan. 19-23): Upriver Restoration

On Friday, Jan. 19, the Bonneville Power Administration (BPA) reenergized power lines the federal agency owns in the McKenzie Valley. That progress allowed EWEB crews on Thursday to restore power to the customer-owned utility's Holden Substation, which feeds customers from approximately the town of Walterville to Vida. And that restoration, in turn, allowed for Friday's big push upriver to repair and restore EWEB customers' power. Some areas took longer to reach due to coordination with other agencies to clear roads to get access before staff could assess damage and make repairs.

On Friday and Saturday, the majority of EWEB crews and six contract crews focused restoration efforts on the Camp Creek, Deerhorn, Thurston and Walterville areas. A few EWEB crews began work in Eugene on single service restorations. By Sunday, less than 2,700 customers remained without power.

In areas like Deerhorn and Cedar Flats, the damage was so extensive that EWEB had to wait for other agencies to provide access. Some of these areas saw widespread stretches of poles broken due to ice and trees, but crews were prepared with the equipment and resources to make repairs. Customers in these areas were told to expect a few more days before an estimated time of restoration. It is challenging for crews to provide estimated restoration times for customers in the lower McKenzie Valley because of the extensive damage to electric equipment in these areas.



HIERARCHY OF REPAIR

EWEB follows a "hierarchy of repair" when restoring power after major outages. This system is used throughout the utility industry to get power turned on the fastest to the highest number of people.

The order of priority means first making safe any situation that poses a threat to public safety, such as ensuring downed powerlines are not sparking and critical facilities such as hospitals have power. After that, crews begin repairing downed transmission and distribution lines that will restore power to the greatest number of people, then focusing on repairing lines that serve fewer customers.

For example, repairing one large transmission line can restore power to thousands of customers, while repairing a small "tap" line that serves a few people in a neighborhood often is more time consuming. The repair of the individual service line that provides power to a single home is often last on the restoration priority list.

The damage sustained at the service line is the most time-consuming to repair. A crew might spend the same amount of time restoring power to a few customers as it takes to restore power to several hundred customers.

ACTIVITIES ACCOMPLISHED

- **Friday, Jan. 19:** 3,515 services restored
- **Saturday, Jan. 20:** 3,040 services restored
- **Sunday, Jan. 21:** 3,255 services restored
- **Monday, Jan. 22:** 2,727 services restored
- **Tuesday, Jan. 23:** 218 services restored

Days 12-16 (Jan. 24-27): Restoration, Repair and Stand Down

On Wednesday, Jan. 24, 1,000 customers remained without power and restoration response upriver continued, especially the Deerhorn, Cedar Flats, and Camp Creek areas. Nearly 20 linemen and 15 support staff worked dedicated to the Deerhorn area replacing dozens of damaged power poles. In addition to poles, crews replaced above or below-ground transformers that were damaged and miles of feeder lines. Due to the tight roadways and terrain, there was a limit to the number of staff, equipment, and trucks that could occupy that area safely, and all available resources were invested to a safe capacity. On Wednesday, 12 crews worked in the lower McKenzie, and repairs to the Walterville main feeder line restored power to more than 200 customers. The remaining 2-person crews made significant progress restoring single-service damages in the metro Eugene area, where customers had already engaged an electrician to complete customer-side repairs.

Thursday night and through Friday, crews made significant progress on Camp Creek and Deerhorn. Power had been substantially restored on Camp Creek and the Deerhorn area was energized up to and including Booth Kelly Road. The majority of outages in the Deerhorn and Cedar Flat areas were restored by Saturday afternoon.

When work was deemed manageable by internal crews and normal operation support personnel, contract crews were released. EWEB stood down ICS on Sunday, Jan. 28 at 0600. At that time, less than 400 electric services remained out of power. Most of the remaining restorations involved single-service incidents where an electrician was needed for repairs before reconnection. Single premise restorations are often labor and time intensive. Restorations of single services continued for nearly two months following ICS deactivation.

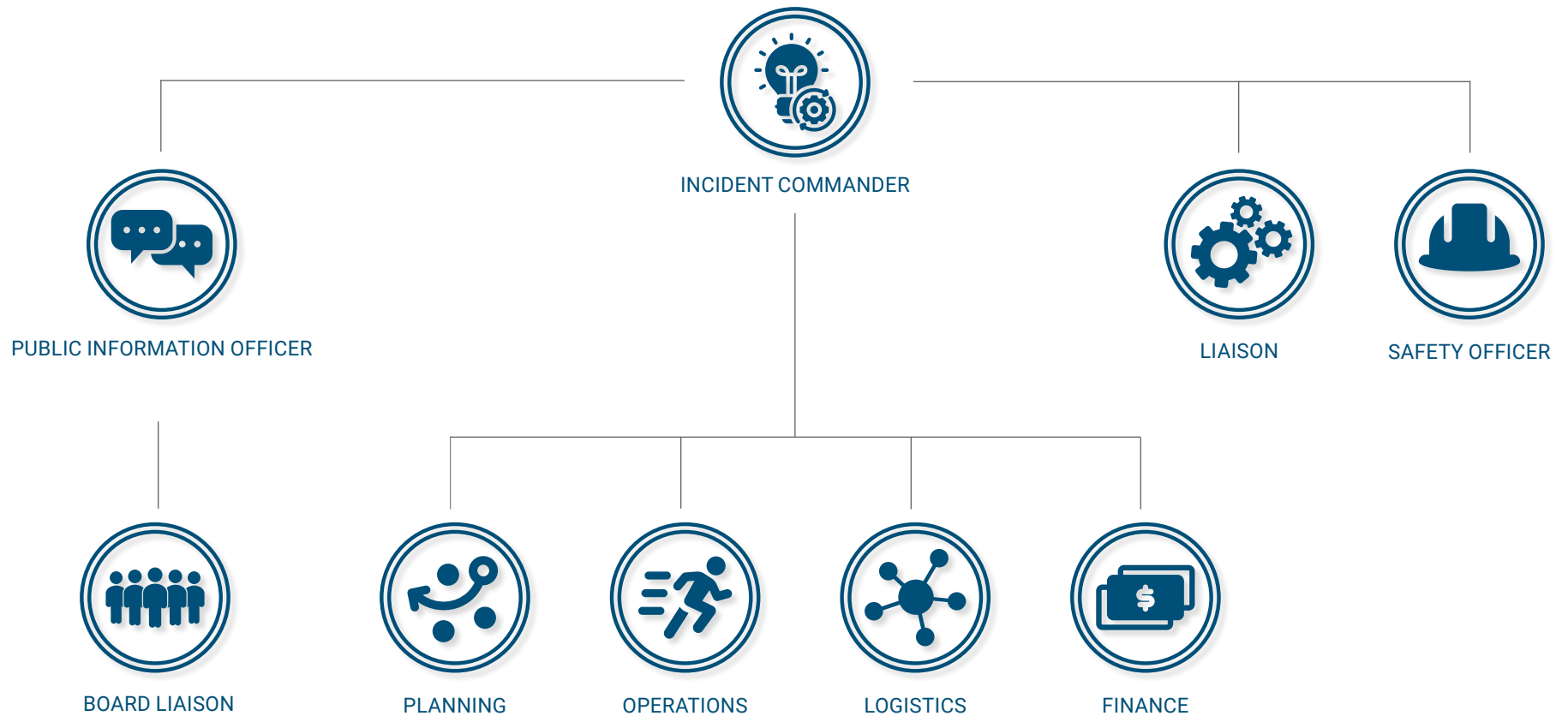
ACTIVITIES ACCOMPLISHED

- **Wednesday, Jan. 24:** 645 services restored
- **Thursday, Jan. 25:** 460 services restored
- **Friday, Jan. 26:** 136 services restored
- **Sunday, Jan. 28:** ICS deactivation



Restoration Performance

ICS STRUCTURE: CHAIN OF COMMAND





Incident Command

CORE RESPONSIBILITIES

- Overall management of the incident
- Approve and direct Incident Objectives
- Approve Staff, Materials and Resources
- Maintain manageable span of control for incident functions

RESOURCES

- Three staff supplied resourcing for the IC function.
- Initially the primary IC held the position during the initial event onset.
- Once sections and processes were stood up and clear ongoing operational periods were established, the primary and secondary developed a rotating day and evening shift.
- The tertiary IC filled in as needed throughout the event for relief of either chief.

SECTION STANDUP

- The IC initiated a "Warm" ICS Standup upon receiving weather alerts to ensure Section chief availability and increased situational awareness Jan. 5, 2024
- Monitoring in warm status continued until the first ICS standup briefing on Jan. 11, 2024 where chief and section availability for future operational periods were to be poised for standup should the event produce substantial outages.
- Full resource activation occurred midday on Jan. 13, 2024.

SECTION PERFORMANCE

- The IC function remained staffed during all hours of operation and held post at the ROC throughout the event.
- Adjustments based on safety, system condition, crew feedback and community need were taken into account for incident objectives and adjustments mid-operational period.

NOTES OF SUCCESS

- Continual staffing on site and engagement.
- Maintained three deep in staffing and maintained a consistent schedule for rest of each chief.
- Coordination with BPA staff allowed for pre-planning of bulk system restorations.
- Regular field visits allowed for assessment of staff and gathering of feedback and situational awareness.
- Holding additional check ins with Section Staff following and outside of briefings allowed for refined information to be disseminated.
- Coordination with PIO allowed for accurate and timely news and social media releases and troubleshooting of ETOR accuracy issues.
- Additional Planning/Ops/Logistics meetings.

AREAS OF IMPROVEMENT

- Maintaining section chief span of control through expanding ICS structure.
- Initial event onset situational awareness through field visits.
- Development of day ahead incident objective priorities for finalization by Planning/Ops/Logistics.
- Appropriate technical and operational support for ETOR process and Outage Map assessment and troubleshooting.
- Maintaining ongoing official event logs.





Planning Section

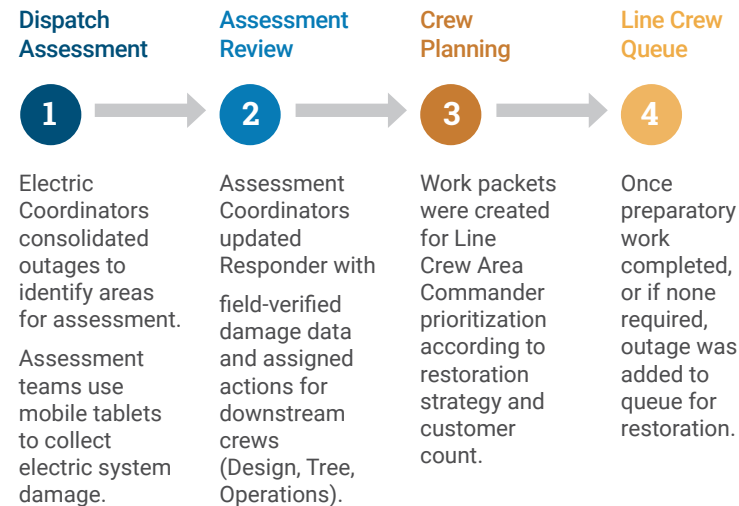
CORE RESPONSIBILITIES

- Develop Incident Action Plan (IAP) every operational period throughout event
- Develop make-safe, triage and restoration strategy
- Perform field assessments and process field damage reports
- Assign crews for restoration work per restoration process
- Collect event documentation, metrics, statistics through Documentation Unit
- Recommend demobilization timing

RESOURCES

The Planning Section included up to 23 office staff and 39 field assessment and triage staff (see details on following page).

PLANNING SECTION PROCESS



SECTION STANDUP

Planning Section staff were deployed upon activation of ICS. The first goal after mobilization was the make-safe stage. The Planning Section worked with the Incident Commander and Operations to develop a restoration strategy, execute assessments and process work packets for crews through the Responder outage management software according to the overall hierarchy of repair strategy.

SECTION PERFORMANCE

The Planning Section successfully produced work in pace with the need of the restoration crews, maintaining a work package queue with 12 - 24 hours of lead time. This fluctuated depending on the complexity of the damage assessments received from the field and planning staffing and crew restoration rate.

NOTES OF SUCCESS

- **Process:** Effective in processing events for restoration by operations. Process modifications were made quickly to address issues brought up by Operations.
- **Training:** Planning Section staff were adequately trained in their roles and able to complete work in the process as defined.
- **Assessment Team staffing:** Staffing was right-sized for processing speed among the Assessment Coordinators and Assessor Crews.
- **Adaptability:** Resource needs were evaluated and resourcing was adjusted to meet the needs as they changed. Many were new to ICS at EWEB which required some on-the-job training.

AREAS OF IMPROVEMENT

- **Resourcing:** Resourcing gaps existed in crucial areas, and additional staff should be trained in order to provide uninterrupted queue flow – specifically the Radio Office, and associate scribes.
- **Strategic Coordination:** Operations and Planning could work more closely to coordinate flow of assignments. In the future, a process for coordinating detailed strategy outside of the IC briefings would ensure that assessments and work packages are processed in the order of restoration strategy. While generally achieved, should be documented a best practice. Clarification or updating tasks, roles, and responsibilities across sections.
- **Technology:** The GIS, Responder and associated hardware performed generally well, and was well supported by IS and GIS groups. Use of the tools is still inconsistent.
- **Process:** Incident management was challenging and inconsistent. Incidents can get absorbed and lost in larger incidents automatically. Incidents can be broken out for evaluation and also get lost in the many.



Planning Section

STAFFING

Staffing fluctuated according to the required pace of assessment, design, and work package creation needed to ensure line crews were continuously occupied. The section consisted of the following teams:

Planning Chief – Provided strategic communication between IC level and situation unit. Led development of Incident Action Plans (IAP).

Situation Unit Leader – Developed situational awareness through monitoring outage data, resource levels and restoration progress.

Assessor Lead, Coordinators and Assessors – Prepared assessment forms for field assessors, and dispatched assessors according to regions based on overall event strategy. Processed assessment records and updated Responder outage management software. Assigned work to downstream process crews.

Design Team – Completed and delivered designs to Operations for damage which required design before repair (broken poles/cross arms, transformer load checks, anchoring, etc.).

Documentation Unit – Collected FEMA required documentation throughout event which does not exist in Responder outage management software or the Work Asset Management (WAM) database.

Dispatch – Monitored SCADA and provided clearance activities for power system protection devices (i.e. high voltage breakers and switches).

Electric Coordinators – Performed consolidation and roll-up quality assurance in Responder outage management software for dispersing to Assessor Coordinators. Coordinated reconnection of “Needs Electrician” customer outages.

Needs Electrician – Managed queue of customers who needed repair by a contractor electrician before reconnection. Processed supervisory letters and coordinated with Electric Coordinators for reconnection.

Radio Office – Directed field restoration and triage activities through radio communications to troubleshooters and line crew foreman.

Triage Coordinator and Triage Crews – Executed make-safe procedures for secondary down wire, including update of Responder outage management software to capture damage.

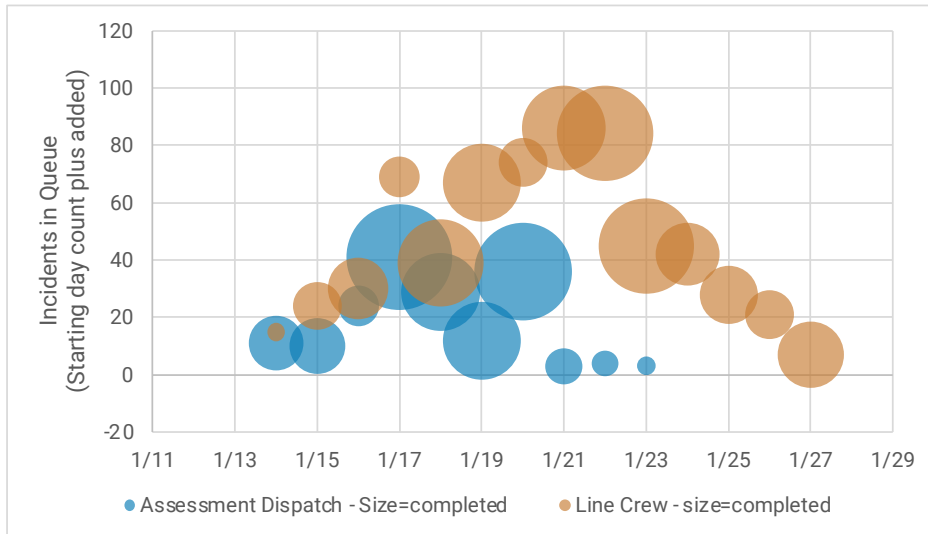
Planning Section Rover – Provided process and Responder support by request and through auditing incidents for correction.





Planning Section

STACKED WORKLOAD FOR ASSESSMENT CREWS & LINE CREWS

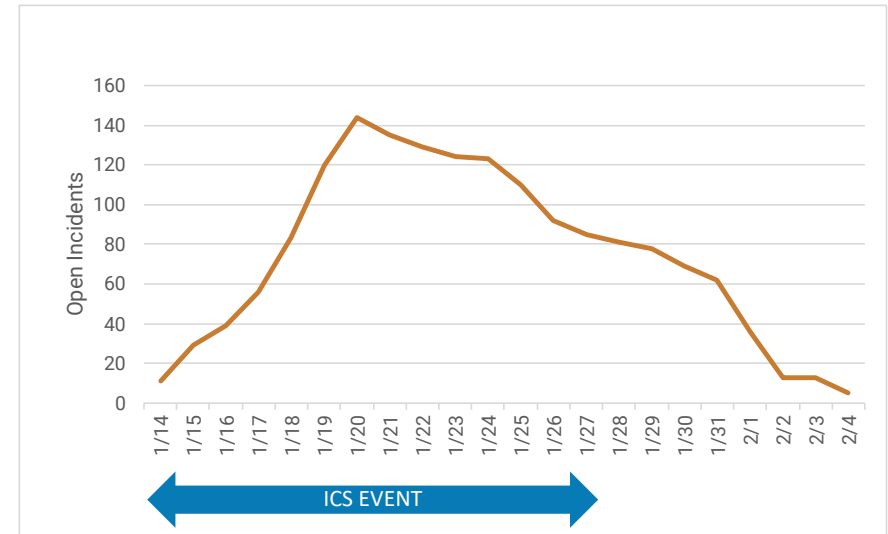


In the initial phase of the event, crews spent a majority of the time making feeder and switching restorations, as well as responding to downed wire reports. As the event progressed into the assessment stage, assessment progress accelerated, as seen from Jan. 17 to Jan. 20.

The Line Crew Planning role of printing and delivering work packages to Line Crew Area Commanders peaked the following day, Jan. 21. Active assessments were completed on Jan. 23, as shown by the flat line at the zero-level following assessment completion to the end of the event.

From Jan. 20 to the end of the restoration period, Line Crews were actively repairing and restoring customers. As the restorations moved to single premises and crews were demobilized, the resourcing level of the crews decreased substantially.

ELECTRICIAN NEEDED WORK QUEUE



As restoration efforts slowed to single premise "Needs Electrician" responses, the restoration pace slowed.

This queue builds throughout the storm recovery efforts as customer damage is reported during assessment by phone and from restoration activities. The queue then drops dramatically as customers actively acquire repair services towards the end of the event as neighborhood power is brought back.

This flow of restoration for single premises is shown in the figure above, where the work queue builds during the ICS event, with restorations continuing after the event is complete. Some customers experienced outages up to two weeks following the event due to access, response time for contracted electricians and final processing by EWEB crews.



Operations Section

CORE RESPONSIBILITIES

- Public and Crew safety (Make safe)
- Implement power restoration hierarchy
- Prioritize work packages
- Form two-person teams for initial triage
- Release first responders (Police & Fire) upon arrival to wire down scenes in the field
- Determine workload of crews and recommend field resourcing
- Onboard contract crews
- Form and manage two-person teams for the end of storm for service reconnects

RESOURCES

- 3 Section Chiefs
- 17 Line Crews
- 119 Poles Replaced
- 253 Cross Arms Replaced
- 84 Transformers Replaced
- 7 Substations Offline
- All line crews worked from Jan. 13 to Jan. 27; Declaration Issued Jan. 14
- All crews and trouble shooters worked 0600-2200 remainder of event

SECTION STANDUP

Three crews and one Line Crew Leader II were called Jan. 13 for initial restoration activities. At first, restorations were focused on the McKenzie River Valley, then spread to the metro area of Eugene. The decision was made to call all crews in on Jan. 13. After full internal callout was initiated, and initial damage assessments gathered from field personnel, it was evident that mutual aid crews would be required due to the extent of the damage.

SECTION PERFORMANCE

During ICS events, the Operations group mimics normal operational duties with expanded resourcing and increased pace. Following ICS activation, two-person teams were formed to respond to initial outage reports. As the storm and damage developed, full line crews were formed from internal line staff, and additional crews were acquired.

Throughout the storm, Operations maintained a focus on safety by keeping two-person teams dedicated to responding to downed wire or severe damage. The remaining crews were organized and dispatched by area commanders for repair and restoration of customers. Crews were assigned to regions, with restoration job packets consisting of maps, materials, and damage reports. Priority of restoration was determined by hierarchy of repair and customer count, with a goal of each crew restoring the maximum number of customers in the shortest period.

Job packets were prepared by the Line Crew Planning office within Operations. These packets were based on field assessments by the Planning Office. Upon arrival to a restoration location in the field, a reassessment was completed to ensure no new damage had occurred, to confirm needed materials and resources, and to identify any safety issues.

NOTES OF SUCCESS

- Line workers as Field Area Commanders aka “Bird Dogs.”
- Time sheet accuracy and completion.
- Crew location on upriver paper wall sized map.
- Releasing wire watch teams.
- Ability to communicate with other section Chiefs.
- Use of contracted helicopter for remote transmission line assessment.
- Direct issue material for capital jobs.
- On hand material and re-ordering.
- Pre-prep Meetings prior to main ICS briefing.
- Tree crews with Line crews.

AREAS OF IMPROVEMENT

- Field Ambassadors to meet with customers during event and establish realistic and timely ETORs.
- Timely and consistent estimated time of restoration (ETOR).
- Contractors and crews need to utilize iPads that can download maps to aid in efficient work completion.
- Finance briefings about time ticket expectations for contractors.
- Daily log for crews.
- Select utility liaisons before storm.
- Connex boxes stocked for storm season.



Logistics Section

CORE RESPONSIBILITIES

- Check in/out contracted staff to include lodging
- Staging area set up
- Maintain and repair vehicles and equipment
- Procured air assets for line inspections
- Provide fuel for back up generators
- Manage wire watch, runners, and flagger staffing
- Procure and deliver meals

RESOURCES

76 EWEB staff members helped work the storm on the Logistics Team, including the Chief, Coordinators, Wire Watch, and other staff running parts, meals, and incidentals. The support group pulled staff from ten different EWEB departments and ten contracted Flaggers.



12 wire watch locations



100+ traffic locations

SECTION STANDUP

During the storm, Logistics had several important tasks which were needed immediately upon ICS activation: arranging food, equipment and accommodations as well as internal staff deployment were the first priorities.

SECTION PERFORMANCE

Throughout the event, over 100 traffic locations were established, using up to 27 flaggers at one time in ten different locations. Wire watch was deployed at 12 different locations to maintain situational safety. There were 200+ requests for runners throughout the storm.

Additional logistical requests included:

- Transporting EWEB employees to and from their homes
- Running tools and materials to crews
- Providing fuel to Hayden Bridge and upriver facilities
- Picking up items for the Warehouse when delivery companies were unable to deliver materials
- Maintain contractor vehicles

EWEB experienced eleven water service interruptions throughout the duration of the storm. This was impactful as several of the core Logistics staff are sourced from the water department. These additional events put pressure on the Logistics staffing.

NOTES OF SUCCESS

- Over 80 purchases made with zero lost receipts.
- Established dedicated coordinators for runners, wire watchers, and traffic control/ground personnel.
- Established a process for employee/contractor laundry service.
- Fleet provided fueling services for Hayden Bridge and upriver facilities when our distributor was unable to deliver fuel.

AREAS OF IMPROVEMENT

- Need a “live” ICS documentation program that is user friendly and we can easily pull information out for FEMA.
- Resource unit did not receive any request for staffing needs and work can be done on the check in/out process.
- Create an intake/processing flow to centralize and track incoming logistical needs.
- Limited inventory and locations for common use warehouse items.
- Personal vehicles in the ROC yard.





Finance Section

CORE RESPONSIBILITIES

- Create emergency contracts
- Procure and distribute supplies
- Identify, estimate and record costs
- Ensure continuity of financial resources: Accounts Receivable (A/R) and payable
- Handle claims

RESOURCES

Supply Unit accommodated the line crew schedules by having all staff on hand for morning loading (6:30 am) and keeping at least 2 staff on hand for end of day (8:30 pm).

Procurement Unit spent significant time during the entire event ensuring contracts were in place and stock was adequate.

Time Unit on-site every day entering crew time and equipment and answering questions. Significant effort required to ensure accurate time reporting based on HR policy understanding and instructions.

Cost Unit worked onsite to help answer questions about work orders, adding tasks and/or creating new work orders as needed

Claims Unit available, but very little activity during ICS.

A/R Unit was not created or tested during drills.

SECTION STANDUP

The Finance Section Chief was activated Jan. 11 at 1500. Supply, Cost, Procurement, Time, and Claims Units were notified for availability and activation on Jan. 11 at 1140. Initial work concentrated on emergency contracts, p-card limits, materials management and distribution, and activating ICS work orders and time codes.

SECTION PERFORMANCE

Procurement: Prior to storm season, stock was increased on several restoration materials. Emergency trailers were stocked and several storm baskets prepared. There were few stock shortages and staff quickly sourced materials as required, thus reducing the restoration efforts. Contracts were prepared in advance and new contracts were executed in reasonably short order.

Supply: The unit was able to keep up with crew requests. Demobilization of the crews and returns went well, but staff would like more notice to prepare for returns. The additional container of materials stored off-site (ORAQUA) did not work well for supply or crews. It was not utilized due to the location and used critical resources to stock, manage, then return. Staff suggest a mobile option that can be placed near crews for future events.

Time: Crew time/equipment was entered daily. The time ticket entry process increased efficiency. Payroll validation was time consuming.

Cost: Regional and standard work orders and guides were created and distributed January 12 in anticipation of the storm event. Unit staff were available to Operations to answer questions and the process to update/generate work orders was effective. Process review will continue throughout FEMA application work.

Claims: During ICS, a majority of work was around employee incidents which were handled by the Safety Officer. Suggest moving that work officially to Safety.

NOTES OF SUCCESS

- Stock levels were adequate for restoration needs.
- Emergency trailers/storm baskets available.
- Unit availability quickly determined and documented.
- Emergency contracts were quickly executed.
- Quicker recording and interfacing of costs/ time allowed for faster/more accurate projections.
- Demobilization and stock return went smoothly; contract crews provided feedback that EWEB Warehouse operations among the best they've seen.

AREAS OF IMPROVEMENT

- Foster workforce resiliency; encourage and facilitate employee and family emergency preparedness.
- Need to create A/R Unit procedures.
- Conex Box for Upriver supply was barely used; time drain for supply staff to stock and return items.
- Cost Unit needs to develop additional templates/ cheat sheets.
- Metered Services role in ICS should be solidified.



Liaison Section

CORE RESPONSIBILITIES

- Serve as EWEB point of contact for partner agencies; elevate priority incidents for EWEB response.
- Support Customer Relationship Managers with updates involving key account customers.

RESOURCES

The Liaison Office was able to manage this prolonged ICS event with two primary liaison officers, a remote back-up liaison and an experienced scribe. A back-up scribe was activated as well but had limited in-depth training in Responder. This event provided hands-on learning of both the process and tools for all Liaison office staff (this was the first major winter storm event for the primary liaisons).

Due to the combination of the number of incidents that were being tracked and attendance at state and local cooperator's meetings, it was helpful to have both liaisons available during day-time hours, with at least one Chief at the ROC. Road conditions initially prevented the scribe from coming into the office until a few days into the incident, but they could still be effective remotely.

Two of the liaisons had issues with access/training in the Responder Web Portal version which limited their ability to research incidents. The scribe role was invaluable to limit reliance on other staff to gather incident status and highlights the need for bench strength and experience in this role.

SECTION STANDUP

EWEB's Liaison Office was activated on Thursday, Jan. 11. An email communication was sent out to the Liaison contact list at approximately 1700 to alert partners of EWEB ICS standup and to direct communications to the shared email. Updates to this communication list were needed almost immediately despite revisions in 2023. Overall, activation was successful in establishing inter-agency communications with a few areas of improvement noted for future.

SECTION PERFORMANCE

The Liaison office tracked 74 incidents over the course of the event, working directly with other agency staff to relay information in a timely manner so that trees could be safely removed and streets cleared. In addition to specific incident updates, the Liaison office shared daily updates with partners based on EWEB briefings and attended State of Oregon, Lane County and City of Eugene cooperator's meetings for additional information exchange.

The large majority of incidents reported to the Liaison office were from the City of Eugene. The scale and magnitude of damage to some county roads was beyond what is typically tracked through the liaison office; aka the entire road was impassible/inaccessible. The office coordinated delivery of 25 water containers donated to Leaburg Fire and Rescue for area residents, and worked with Lane County Public Health on welfare checks with customers who rely on electricity for medical equipment. Partners reported that the level of communication and response was excellent and appreciated. A hotwash with liaison staff from the County and City has been requested.

NOTES OF SUCCESS

- **Training:** Both a scribe and one liaison with full Responder access contributed greatly to liaison office effectiveness.
- **Resources:** Availability of two liaisons and scribe during day-time hours, and one person in office to elevate priority incidents and get updates.

AREAS OF IMPROVEMENT

- **Process:** Agreed to definition of high priority incidents and process for elevation.
- **Technology:** Modernize tools for incident tracking (both Responder and collaboration with partners).
- **Training:** More pre-event training with partners and internally, particularly with upgraded Responder.

ACTION ITEMS

- Review & update liaison forms/templates/methods of communication.
- Hotwash and blue-sky drill with partners.
- Engage in training for upgraded Responder, continue to build bench strength for scribe.



Public Information Office

CORE RESPONSIBILITIES

- Based on likely longevity of mass outages, begin communicating with internal/ external audiences using pre-written “evergreen” messages.
- Compile and translate outage/ assessment/restoration information gathered from ICS officers, other staff and Responder to communicate with all internal audiences, customers and the media.
- Provide best available updates to internal and external audiences throughout the event.
- Manage digital and traditional news media communication channels.

RESOURCES

When ICS was activated, the section was staffed by a primary and secondary PIO. On Jan. 16 an additional team member was brought in to round out the core team with a Primary, Secondary, and Media Representative, collaborating on messaging and tasks as necessary. The secondary PIO was responsible for coordinating additional tasks with PIO assistant staff, including social media messaging, graphic design, and program coordination. Customer Service and the Board Liaison worked as a branch of the PIO team. A PIO Teams channel was established to share information between key stakeholders.

SECTION STANDUP

The Public Information Officer (PIO) was activated on January 11, 2024, after the Command Staff ICS briefing. In preparation for a potential storm, PIO initially communicated a weather alert and notice of potential power outages internally and externally on social media channels.

The staff member who typically acts as the Primary PIO was out of town for the first few days of the event. The role leaned heavily on the secondary and back-up staff without issue because of PIO team planning, training, and staff expertise.

SECTION PERFORMANCE

As is common during emergency events, information was limited and imprecise for the first several days. Using pre-written messages and communicating realistic expectations helped fill the void for information about specific restoration updates.

After the second storm passed a better understanding of the scope of the damage to the system in Eugene and the McKenzie River Valley allowed the team to begin sharing more specific information, including ETORs and daily restoration plans. Establishing a daily narrative of information was a key strategy for maintaining customer trust and confidence even when detailed information was unavailable.

Public Information Team members worked collaboratively with Operations and Planning to gather the most up-to-date information to share with CSAs, customers via our social media and eweb.org platforms, as well traditional media. Early on, the PIO team discovered inaccuracies with the information on the online outage map, the main tool used for outage updates. Fortunately, the Planning section prioritized an outage map strike team to ensure attention was given to the outage map, resolving issues in real-time.

NOTES OF SUCCESS

- **The PIO team was prepared and trained.** Having staff that dedicate time to focus on developing PIO team structure, playbooks and trainings year round contributed to an efficient and organized PIO team.
- **Daily information narrative.** The PIO team established a structured approach to daily updates using social media, the website, and traditional media. Each day had a headline theme that helped keep information organized and relevant for each phase of the restoration response.
- **Approach to social media engagement.** The PIO team made the decision not to respond to individual Facebook comments. This strategy reduced emotionally charged comments, the spread of misinformation and also streamlined PIO duties.





Public Information Office

SOCIAL MEDIA



129 posts



564,924
Times people saw
EWEB posts



4
Platforms
(Facebook, Instagram,
NextDoor, X)



71%
Positive feedback from
viewers

TRADITIONAL NEWS MEDIA



40 stories



27
Television



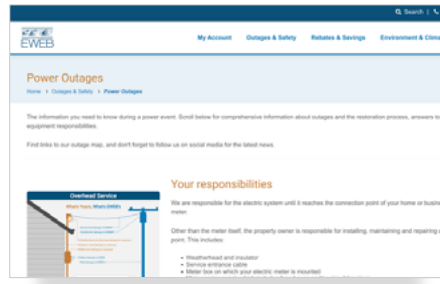
3
Radio



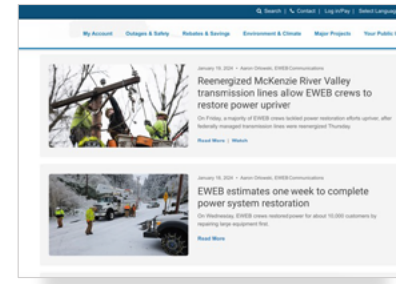
10
Print



432,405
Outage map views



34,078
Power Outages Page
Views



4,305
Newsroom story
page views

AREAS OF IMPROVEMENT

- The customer outage experience during major outage events. To maintain trust and confidence, we must provide efficient tools and timely, reliable information. During this event we uncovered failures with the outage reporting system, text message updates, and online outage map. Work must be done to provide a quality customer outage experience without “dead-ends.”
- Reliability in outage data entry and outage map information. A band-aid was put on the outage map during this event after discovering inaccuracies and lack of data entry. Whether this was a manual issue in Responder or technical difficulties, the outage map MUST be able to perform two basic functions: 1) Accurately display all known outages and 2) Give customers a reliable estimated time of restoration.
- PIO and Operations Communication. This storm demonstrated that the process for receiving updates and information from the Operations section was under-developed. Streamlining the communication between the two sections would improve the quality of information provided to customers.
- Communicator tools for major outage FAQs. Although customers found the Hierarchy of Repair information useful, more emphasis can be put on explaining the hierarchy. For instance, explaining why upriver customers may wait longer than Eugene customers for restoration after an event that impacts a wide service territory. More pre-made tools would be helpful to explain downed wire safety, “what to dos” and single service electrician information for CSAs.
- Explore outlets for disseminating updates to upriver customers.



Safety Section

CORE RESPONSIBILITIES

- Provide IC Briefing information on weather, crew condition, operational recommendations and information for communication to Command Staff
- Perform field visits and crew evaluations to audit conditions
- Provide safety equipment and supplies to field staff as needed
- Escort dignitaries, media and executive staff on field visits

RESOURCES

- Safety officer available from 0600 to 2200 for the duration of the ICS event. Secondary officer available 0600 to 1700.
- Initial staffing model
 - Two safety staff during daylight hours (0600-1900)
 - One safety staff second shift (1700-0900)
- Single shift staffing model
 - One safety officer (0600-2200)

SECTION STANDUP

The Safety Officer role was activated on Jan. 14 at approximately 0600. For the initial days of the response, two safety staff were available during daylight hours (0600-2200).

SECTION PERFORMANCE

Safety Officer and staff support of field crews and IC senior staff went very well. Briefing reports were uniform, complete and provided accurate information on field conditions. Safety staff escorted guests to visit field staff without incident. Safety staff were able to provide PIO photo documentation of field conditions which were then shared with the greater community via social media.

Additionally, safety reports were received and processed to look at the following categories of metrics:

- All Injuries
- OSHA Recordable Injuries
- Vehicle incidents
- Good Catch / Near Miss reports
- Property Damage reports



2 OSHA recordable injuries



11 minor injuries



8 property damages



15 good catches/near misses

NOTES OF SUCCESS

- Safety Officer escorted media/executive team members safely to field operations.
- Photo documentation provided to PIO for use on social medial platforms.
- Shared presentation of Daily Safety Briefing with all ICS staff (field & support staff) by Operations Officer and Safety Office:
 - 16/8 work shift
 - 2 OSHA recordable injury incidents
 - 3 lost work days due to injury
 - Crew condition (mental & physical) was good through whole event
- Solidified 3-deep training of Safety Officer position by taking advantage of job-shadowing opportunity during first five days of ICS event.

AREAS OF IMPROVEMENT

- Observed occasional exposure of field staff in roadway/ right-of-way without Class 2 Hi-Vis clothing or vest.
- Safety office to evaluate stock of storm-related safety supplies to be stored in warehouse in safety area. These materials are not available (sold-out) at vendors once storm arrives (cold weather gloves, ice-trekkers, hand creams, lip balm, hardhat liners, etc.).
- EWEB needs to evaluate Mutual aid contract requirements around safety. Saw multiple violations regarding PPE and vehicles.
- Some staff had difficulty due to travel or proximity getting home during the rest period for recuperation. Evaluate options for staff support for accommodations to avoid fatigue related injuries.
- Provide Wire Watch and make-safe support for County, ODOT, and City of Eugene road/tree crews to remote areas as soon as possible and when safe to do so. The balance between resource availability and community safety is complex.



Board Liaison Section

CORE RESPONSIBILITIES

- The Board Liaison reports to the Public Information Officer (PIO)
- Obtain briefing from Incident Commander, review shift notes from alternate Board Liaisons, and ICS Documents
- Receive, review, and communicate to the Board the Incident Action Plan (IAP) Form ICS 201 from the Incident Commander
- Maintain contact with the Public Information Officer to review internal communications and media releases
- Participate in Incident Command Team meetings and provide general status report and feedback via the PIO to Incident Commander from Board and Executive Team
- Provide the Board and Executive Team with regular status reports obtained at the Incident

RESOURCES

One person on duty is adequate, with alternates available to provide relief as needed. Worked closely with PIO office and had access to Chiefs as needed for additional information. Updated the Board once daily, unless situation called for more or less communication, as dictated by circumstances. Hours are more flexible than other positions, and staff can work from home and call in and email remotely, primarily in the evenings.

SECTION STANDUP

Public Information Officer activated Board Liaison on Jan. 11. Initial actions were to attend ICS Briefings regularly, via Teams . Used approved messaging and/or coordinated with PIO on outgoing messages to the Board and Executive Team prior to disseminating the information.

SECTION PERFORMANCE

Received correspondence and questions from Board members, primarily formulating responses to the inquiries that the Board had received. Informed Board on restoration process, provided evergreen messages for them to use when talking with the public, and other messaging.

Called and spoke to each Board member on Jan. 17 (day seven of ICS/day five of the storm) to see if there were any needs as a proactive approach to addressing any information or additional concerns. Commissioners were offered an opportunity to accompany the Safety Officer on field crew visits; all participated, with the exception of one board member who was already activated in their own employer's emergency response.

Participated in several County-wide coordination meetings with the Liaison Officer – which provided a broader picture of the event and how other utilities and public services were performing due to the storm.

NOTES OF SUCCESS

- Communications with IC and PIO and Communications staff; information was accessible.
- Opportunity to stay and ask questions after the briefings was helpful for clarifications.
- Scribe was a valuable resource for researching Commissioner inquiries about specific outages.
- Amount of information to Board and Executive Team was appropriate. Role seemed to be well respected amongst rest of ICS staff and team.

AREAS OF IMPROVEMENT

- Additional Responder/Outage System Training.
- ICS Form 214 was not consistently used.



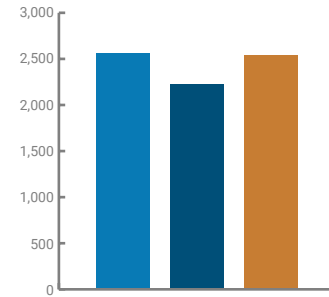
Reflections from Past Storms

The 2024 Ice Storm surpassed past storms on record in duration, system and community impact, outage count, and cost. Storms statistics can be difficult to compare due to unique weather, system configuration, and timing considerations for the region. The closest comparators are the 2016 Ice Storm and the 2019 Snow Storm. **Statistics associated with this storm have indicated that EWEB was able to restore power at a similar pace on a customer-per-day basis despite the extensive damage experienced beyond other storms.**

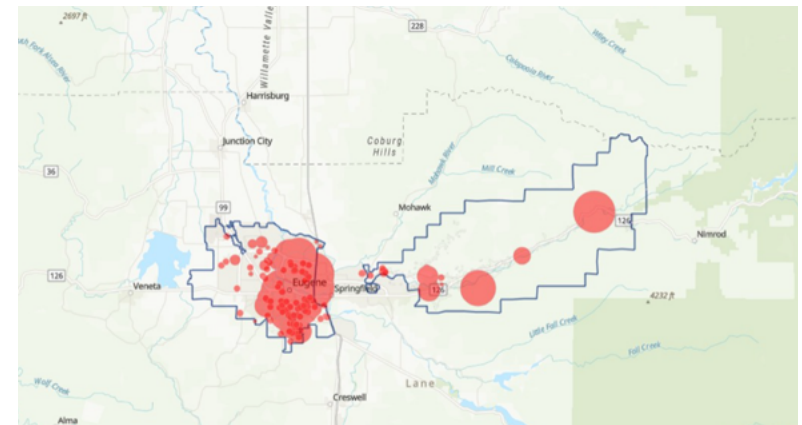
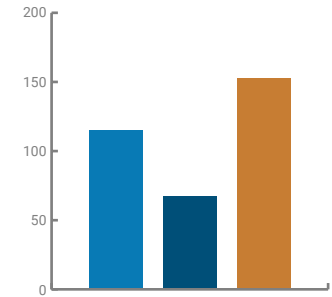
EWEB has invested in ICS-related continuous improvement around training, systems and processes, and as a result **saw an improvement in the ratio of Customer Outages processed to FTE.** This storm was also unique in the management of the event. It was the first for EWEB in a combined ICS approach for all divisions through one ICS structure. The structure included Electric, Water, Generation and Communications responses to increase coordination for work groups, and also to make more efficient and streamline the requests to logistics and other support functions. This method was proven to work, though it will need focus and discipline through planning as well as additional resources in the Operations and Planning sections to implement in future events.

EWEB learned during the 2016 Ice Storm and following the storm through public comment during live town hall sessions and online surveys that communication was important for the community to make decisions and plan during these events. EWEB launched a Public Facing Outage Map following that storm and it was used in the 2019 Snow Storm with success and in the 2024 Ice Storm as well. Several features were added between the 2019 and 2024 storm to aesthetics and presentation. However, the back-end process of entering and maintaining data is still a manual process due to reliance on current systems. Both storms experienced additional resource strain to achieve up-to-date information and difficulty providing reliable data at the individual, customer-specific level. Due to lessons learned from the 2019 Storm, EWEB dedicated resources to the map in 2024.

CUSTOMERS RESTORED PER DAY



RATIO OF CUSTOMER OUTAGES PROCESSED PER FTE



EWEB's Outage Map.

Reflections from Past Storms

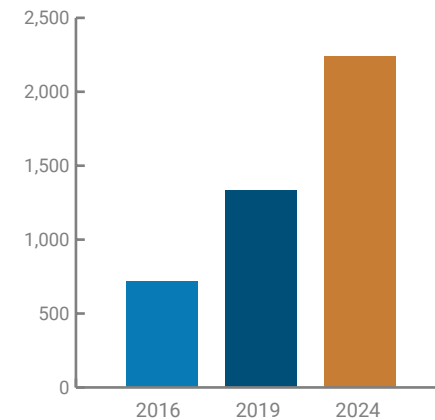
Due to EWEB's day-to-day Asset base and Territory size, staffing is not at the level needed in normal operations to respond to large events without assistance. Mutual aid or contracted crews will continue to be a strategy for accelerated outage restoration. **This storm saw an increase in the ratio of restorations per crew, though this is influenced by the type of damage experienced, this storm saw close to double the previous damage to capital equipment that requires more time to replace than wire alone (transformers and poles).**

In addition to the factor of more efficient processing and support functions upstream of crews, this is the first storm that work schedules were tied to a fatigue standard following the first stand-up period of 16 hours worked and 8 hours rest. This proved to maintain crew wellness and avoided fatigue over the 15-day response period which is around double of previous storm durations. Safety was an important factor and drove work decisions and pace and was similar in terms of incidents per day. A majority of field related safety incidents were associated with minor slips and trips.

A notable factor to the storm's success and an item that was managed actively was concerning the number of staff in new roles both in an ICS function and new to EWEB or the workforce. EWEB has seen an unprecedented amount of staffing transitions due to retirements, staff departures, and promotions within the company. Additionally, new staff have been added across the organization to support an aggressive capital improvement plan. This resulted in many employees experiencing their first storm response effort, sometimes all employees in a response unit. This was mitigated through training in the prior year, as well as dedication from more senior employees who served as mentors and quality control for response processes.

Every storm response and requires an extraordinary effort to restore customers in a timely and safe manner. This storm was nearly double of comparable storms, and the reliance on employee knowledge, skills, abilities, and attitude was the most critical asset to the storm response. This storm affected nearly all the lower Willamette Valley where past storms were isolated to the South Eugene or Upriver territories. This resulted in numerous staff being affected at home unlike before, and these staff and others less affected rose to the occasion in a manner that represented a response of immediacy without panic.

RATIO OF RESTORATIONS BY CREW



Conclusions & Recommendations

High-level themes of areas of success and improvement will be emphasized for the remainder of 2024 and implemented into the planning and execution of EWEB's resiliency work through training, equipment, material stocks, process improvements, and functional exercises.

AREAS TO CONTINUE TO EMPHASIZE

- Annual technical role training in processes and systems used in storm response.
- Maintain consumable, equipment and materials stock with pre storm season verification and on hand increases for winter months.
- Policy driven support of ICS training, resource dedication for planning and implementation of improvements and organizational goals for training.

AREAS TO IMPROVE AND DEVELOP

- Increase Chief-level resources to allow for more holistic management of the event by all organizational business units (Electric, Generation, Water, Communications).
- Update and refine the Assessment and Restoration Process ensuring that ETOR data is readily available and reportable for the current and future public-facing mapping systems.
- Increase use of FEMA forms and standard practices to improve documentation and standardize processes to streamline Activation/Deactivation for staff, resource requests (staffing, equipment, materials), and multidivisional coordinated response.