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Providing emergency kit items at normal utility gift giving opportunities has been an effective way to sustain the conversation and develop a culture of personal preparedness.

Facilities Plan

In 2013, the Central Lincoln Board of Directors hired a new general manager and specified disaster preparedness as one of their priorities. That same year, the Oregon Department of Geology and Mineral Industries (DOGAMI) completed mapping of the tsunami inundation zone for the entire Oregon coast. The DOGAMI maps brought an awareness of the natural hazard risks to coastal communities and raised concerns within the utility regarding the location of its business and operations centers.

As a result, Central Lincoln hired an outside party to conduct a high-level assessment of its business offices, headquarters building and operations centers and to subsequently develop a Facilities Plan. Having an outside party complete the evaluation provided the utility with an unemotional and unbiased view of its facilities. The purpose of the Facilities Plan was to inform long-term financial planning and prioritize next steps based on identified risks including an earthquake/tsunami event.

Each facility was reviewed for its proximity to the tsunami inundation zone, age and condition of the building, operational functions and services and geographic distribution of customers served. DOGAMI maps were used to determine the facility's proximity to the tsunami inundation zone. The building construction date was used to determine if the facility was constructed using state seismic design requirements. Customer service data, including the number of calls, walk-in customers and transactions completed was used to understand the customer service profile for each business office. All data used in the review process was either in-house data or information readily available online.

In April 2014, the Facilities Plan was presented to the Board and outlined the overall status of Central Lincoln's business and operations centers. It provided recommendations for new construction, seismic retrofitting and closure of facilities based on the geographic distribution of customers, proximity of alternative locations, growth assumptions, service efficiencies, cost effectiveness and mitigation of risks including cybersecurity and the occurrence of an earthquake/tsunami event. The Facilities Plan has served as an important guidance document as management strives to ensure a safe work environment, create operational efficiencies and provide customers with the services they want.

As recommended in the Facilities Plan, Central Lincoln closed three of its five satellite offices. Two offices



DOGAMI developed tsunami inundation zones for the Oregon coast. Full-sized maps available: www.oregongeology.org

were located in the tsunami inundation zone and another had staffing and safety issues. The timing of office closures coincided with staff retirements or natural attrition and no jobs were lost in the process. In each case there were secondary reasons for the office closures, including a location that was in close proximity to another office and, a low volume of customers — primarily due to efficiencies created by the AMI and new communications systems. The two remaining satellite offices are both co-located with an operations center and leverage shared systems including the fiber and communications network. As Central Lincoln has closed offices, it has sought new ways to serve its customer-owners and now offers more online pay options, an enhanced phone system and extended office hours.

The Facilities Plan included a recommendation that geotechnical and seismic analysis be completed on the headquarters facility given its primary role in utility operations. The analysis was completed through a series of steps. A geotechnical survey was performed in 2014, a seismic evaluation in 2015, and a secondary review and cost estimate of seismic retrofits in 2017. Considering that the building is oversized for its current use and the relatively high cost of seismic retrofits, management is currently exploring options including new construction and co-locating headquarters with an existing operations center.

Another recommendation of the Facilities Plan was to replace Central Lincoln’s primary operations center. The operations center was constructed more than 60 years ago, had outlived its useful life and was located in the tsunami inundation zone. The facility provided operational support for the utility’s entire system and was critical to on-going operations. In 2015, Central Lincoln began the process to sell bonds, purchase land and construct a new operations center. Construction of the new operations center was completed in 2017. The new primary operations center is located outside the tsunami inundation zone and meets the seismic standards for an essential facility.



The Board also authorized the remodel and seismic retrofit of the utility’s secondary operations facility. The facility, which is located outside the tsunami inundation zone, but does not meet seismic standards, was retrofitted so that employees may safely exit the building in the event of a major earthquake. The third and smallest of Central Lincoln’s operations centers, is located on the edge of the tsunami inundation zone and options for this facility are being explored.

The Facilities Plan reflects Central Lincoln’s everyday practice of prioritizing employee safety first and protecting utility assets. Retrofitting work spaces so that employees may safely exit in case of an earthquake and abandoning work spaces that are located within the tsunami inundation zone to protect assets are in keeping with the utility’s priorities.

Vulnerability and Risk Assessment

In the event of a Cascadia earthquake, Central Lincoln anticipates that there will be damage to its transmission, substation, distribution and communication systems. The utility sought to understand the scope of probable damage, identify areas of risk and prioritize actions for mitigation. Therefore, in 2016

Central Lincoln engineers completed a Vulnerability and Risk Assessment (VRA) of the utility's substation, transmission and communication systems. Technical papers on the 6.9 magnitude Loma Prieta earthquake, the 8.8 magnitude Chile earthquake and the anticipated Cascadia Subduction Zone earthquake were reviewed to determine how Central Lincoln's systems might respond to these scenarios. DOGAMI maps and data were also analyzed against the utility's substation, transmission and communication facilities to further identify vulnerabilities.

As a result, Central Lincoln has taken initial steps to mitigate the risks identified in the VRA report. For substations, new power transformers are bolted to concrete pads, new equipment have seismic ratings, silicon polymer bushings have replaced ceramic bushings, breakers have flexible wire connections, and dead-end structures are designed to resist external pull. Also, an auxiliary breaker will be added to a substation in 2018 while another substation will be relocated to an area outside the flood zone in 2019. For the transmission system, the utility has increased line redundancy, designed steel poles to a minimum of 120 mph, initiated mutual assistance agreements and stockpiled materials. For the communications network, Central Lincoln is looking at a multi-year timeframe to replace much of its current system. In 2018, Central Lincoln initiated a request for information (RFI) process to determine available technology followed by a request for proposal (RFP) process for professional and technical services necessary to deploy the technology. A robust RFI and RFP process gives consideration to the utility's long-term capital budget plus ensures that multiple technologies are reviewed and the selected technology will meet the utility's future needs. In 2018, Central Lincoln updated the VRA to include the distribution system and Information Technology (IT) functional interdependencies.

Incident Command System

In 2015, Central Lincoln adopted the Federal Emergency Management Agency (FEMA) Incident Command System (ICS) and trained all 125 employees in the fundamentals of ICS. The basic course was offered on-site with an instructor who had extensive electric utility experience. The instructor was able to demonstrate how FEMA's command and control management structure applied to the electric industry and how employees could expect to interface with emergency responders during an incident. Since then, dispatchers, supervisors and managers have received advanced training through online coursework and have attended another on-site course tailored specifically to Central Lincoln. Learning to work within the national emergency responder framework is prerequisite to standing up the utility after a major disaster or catastrophic event.



CLPUD staff completed advanced Incident Command System training in 2017.

Mutual Assistance

To restore power to its service territory after a catastrophic event, Central Lincoln will inevitably need help from other utilities. Therefore, it views membership in mutual assistance groups as critical and is signatory to four mutual assistance agreements including the Bonneville Power Administration (BPA), Lane County utilities, American Public Power Association (APPA) and the Western Regional Mutual Assistance Agreement Group (WRMAAG). Further, if Central Lincoln seeks to receive reimbursement for mutual assistance services after a declared natural disaster, “FEMA encourages parties to have written mutual aid agreements in place prior to a declared fire, emergency, or major disaster.” - *FEMA Disaster Assistance Policy DAP9523.6*. Central Lincoln has provided mutual assistance to neighboring utilities on multiple occasions in the last three years and has benefited from shared after action reports, professional networking and exposure to new methods and technology.

Communications

Central Lincoln enjoys a robust communications and fiber network with physically redundant routes; however, after a Cascadia earthquake portions of the service territory are expected to be without communications. To ensure a basic level of communication immediately following a disaster, the utility has deployed stand-alone contingency systems that will allow employees in the field to check in and provide for limited communication between the north and south operations centers.

The utility has identified four primary emergency communication needs including office-to-office, office-to-county, office-to-state, and dispatch-to-truck. To bridge the sixty mile gap between the utility’s business offices, satellite phones are in place and may be used in an emergency for office-to-office and office-to-state communication. Counties within the Central Lincoln service territory have specified that they will use ham radios; therefore, office-to-county communication will be accomplished through the use of ham radios.

To address emergency dispatch-to-truck or truck-to-truck communication, Central Lincoln sought a radio repeater system that would be portable, easily deployed and provided sufficient coverage. In 2016, the utility purchased four radio repeater systems and staged them across the service territory. To ensure that the repeaters would be deployed when needed, all 125 employees were trained to assemble and operate the repeaters. Central Lincoln will continue to update and exercise current communication strategies including the Employee Hotline which allows an employee to call in from any location and receive messages from management.



All CLPUD employees are trained to deploy the radio repeater system.

Leveraging Technology

Central Lincoln recently digitized all archived distribution engineering records in an effort to enhance the utility's ability to recover after a major event. The 1.1 million digitized documents are easily accessible to staff now and will be invaluable in rebuilding the system in the aftermath of a disaster.

The utility has equipped all fleet vehicles with Global Positioning System (GPS) devices to assist in locating employees in the aftermath of a disaster. All meters and most distribution equipment also have GPS addresses which will help to expedite recovery efforts.

Central Lincoln's advanced metering infrastructure (AMI) system has been fundamental to improving reliability and resiliency in day to day operations. Employees are able to view meter data on handheld devices and operators can determine system status from the substation to the customer meter. After a disaster, having eyes on the system to the meter level means that crews can be directed to specific prioritized outages resulting in more timely repairs and reduced outage times. Central Lincoln will continue to use AMI data to optimize its systems including the communication network that it relies upon to operate. With the AMI system, Central Lincoln is in a position to integrate distributed energy resources as they come available including solar, wind, biomass, battery storage and wave energy.

Central Lincoln's will continue to take incremental steps toward becoming a more resilient utility. The utility's documented plans will require updating to reflect the recently adopted preparedness and mitigation strategies including new business locations, work protocols and technologies. Response strategies will require more development (staged supplies, fuel) and practice (ICS exercises). Recovery strategies will include a plan for acquiring materials to rebuild the system and identifying a distributed source of power supply to serve critical loads post disaster.