



OLR RESEARCH REPORT

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TWO STORM PANEL REPORT ON 2011 OUTAGES

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You asked for a summary of the Two-Storm Panel's report to the governor, with a particular emphasis on any issues and recommendations that fall under the Energy & Technology Committee's jurisdiction.

SUMMARY

In the wake of 2011's Tropical Storm Irene and October Nor'easter, Governor Malloy tasked the "Two-Storm Panel" with evaluating the state's preparation and response to the storms and making recommendations for ways to improve future disaster preparedness and response. The panel issued its [report](#) on January 9, 2012.

The report contains 82 recommendations on subjects and issues that fall within the jurisdictions of several legislative committees. This report focuses on those recommendations which could concern the Energy & Technology Committee. Many of these issues could require legislative action by the committee, while others could be addressed through administrative action by the Department of Energy and Environmental Protection (DEEP), the Public Utilities Regulatory Authority (PURA), or the Connecticut Siting Council. Recommendations that could fall under the committee's jurisdiction involved the utility companies, tree trimming, infrastructure hardening, general state issues, communication and information sharing, municipal issues, geographical information systems, and climate change and rising sea levels.

UTILITY ISSUES

The panel reports a “striking” pattern of many of the same recommendations to improve the utilities’ responses to storms being repeatedly proposed over the past 25 years. These repeated recommendations include improving contacts with municipalities, incorporating input from field workers, improving labor relations, and improving supervisory training to handle large increases in work crews. Among other things, the panel also finds that (1) the utilities failed to base their emergency response plans on a worst case scenario, (2) the utilities’ incident command systems were not scalable (able to adapt to anything from small to large-scale incidents), (3) certain utilities’ senior management did not take emergency planning seriously enough, and (4) wireless service providers were not prepared to continue service during a power outage.

Recommendations

The panel recommends that the legislature authorize PURA to develop performance standards for utilities’ response to emergencies, storms, and natural disasters. These should include standards for planning, hazard mitigation, staffing and equipment, response times, and recovery efforts in response to emergencies. The panel further recommends that the Legislature establish penalties for failure to meet these standards. For a discussion of Massachusetts’ laws on utility performance standards and penalties, see OLR Reports [2011-R-0385](#).

The panel suggests that the utilities’ emergency plans be based on the effects of a Category 3 hurricane (i.e., one with sustained wind speeds of 100 to 120 mph.), which would be a true worst case scenario. With this in mind, the utilities’ incident command systems must be able to smoothly adjust their ground responses to outages of any size, and to demonstrate the managerial capacity to increase their field workforce by at least five-fold in a time of emergency. The utilities should also review and revise their mutual aid compacts and major contractor contracts to make such a workforce increase is possible.

The panel also recommends that (1) PURA and/or DEEP ensure that the utilities act on previous recommendations to improve storm preparation and response; (2) utilities be required to maintain a portion of their service fleets for use by outside contractors in case of emergency; (3) state regulatory bodies verify that telecommunications service vendors

have sufficient generator and backhaul capacity to meet the emergency needs of consumers and businesses; and (4) all communications systems accurately account for their effectiveness and “lasting use” during a power outage.

TREE TRIMMING

The panel finds that Connecticut has one of the densest tree canopies in the country and that fallen trees and limbs caused 90% of the downed wires during Tropical Storm Irene. However, aside from safety standards, there are no specific industry standards for tree trimming and no specific criteria by which a person can be appointed a tree warden. Annual budgets for tree trimming and removal range from \$550,000 for the state’s Department of Transportation (DOT), to \$3.4 million for United Illuminating’s (UI) 17 towns, to \$24.6 million for Connecticut Light & Power’s (CL&P) 143 towns. CL&P presented the panel with a proposal to harden and strengthen its infrastructure that included a 50% increase in its 10-year budget for tree trimming and vegetation management.

Recommendations

The panel recommends adopting legislation that would allow utilities or municipalities to more easily remove “hazard trees” from private property, provided there are reasonable protections for property owners. The panel does not specifically define what would be considered a hazard tree, but the term generally applies to trees or branches that are outside of a utility’s normal trimming zone, but present a potential hazard to electric lines because they are dead, dying, diseased or structurally defective. The panel also proposes establishing a state-wide Hazardous Tree Removal Fund to provide matching grants to homeowners for the removal of private property trees that endanger utility wires. This grant program would be funded for five years with 1.5 % of all funds that PURA approves for utility vegetation management.

The panel also proposes coordinating the efforts of the various entities responsible for tree trimming through:

1. a state-wide tree risk assessment and prioritization schedule, particularly targeting hazardous trees;
2. the creation of a State Vegetation Management Task Force (SVMTF) with members from the state, municipalities, utilities, and nonprofit environmental organizations, to develop standards for road side tree care, vegetation management practices and schedules for utility rights of way, right tree/right place standards,

- licensing standards for tree wardens, municipal tree inventories and pruning schedules;
3. a five-year collaborative effort between state agencies, municipalities, and utilities to create an enhanced tree maintenance program and develop an educational efforts on the use of appropriate and diverse tree species in public and private spaces; and
 4. a semiannual coordination of tree trimming/removal activities, monitored by SVMTF, to establish goals and maximize effectiveness between electric utilities, municipalities, telecom utilities, and the state.

INFRASTRUCTURE HARDENING

The panel finds that the general maintenance on the existing pole and wire infrastructure insufficiently protected against natural disasters, particularly falling trees and tree limbs. Although the utilities argued that placing their infrastructure underground was not feasible in many areas due to the cost, the panel determined that the cost of installing underground cables in certain areas, such as cities, was not drastically different from the costs of installing them above ground. It also reported that the majority of studies indicated that the appropriate installation of underground cables and a common system of condensation elimination protected the cables from traffic, frost, and condensation damage.

Recommendations

The panel recommends that DEEP immediately begin studying undergrounding, particularly in city and town centers. The study should cover feasibility, costs, and potential reliability issues.

The panel also proposes that PURA require selective undergrounding of utilities and strengthening assets beyond the requirements of the National Electric Safety Code, with the cost shared between ratepayers and shareholders. The work would be permitted by municipalities, with the various utilities coordinating their above and below ground infrastructure to reduce costs. In addition, when one utility expands or builds new infrastructure, it would coordinate with other utilities to co-locate their infrastructure, where possible, to minimize the cost of burying them underground. PURA and the Siting Council would oversee these co-location efforts.

The panel further suggests that the various entities that own and maintain utility poles develop an audited list of their assets, including their age and wind load, which would be annually provided to a newly created pole administrator position to assist in managing a plan for asset strengthening.

GENERAL STATE ISSUES

The panel finds that neither PURA nor the Connecticut Siting Council can effectively enforce compliance with their own orders and decisions. In particular, it points out that PURA did not uniformly enforce its own storm preparation orders when it approved both CL&P's emergency response plan based on 100,000 outages (8.2% of its customer base), and UI's plan based on a 250,000 outages (71% of its customer base).

It also finds that the state lacked a single entity responsible for developing best practices for utility systems and infrastructure. In particular, it notes that standards for maintenance, tree trimming, and replacement varied among towns and utilities.

The panel states that the failure of a large portion of the state's telecommunications system during the storm should be considered a life safety issue. Among the telecommunication companies, it found inconsistent capabilities for back up generation and backhaul (the physical line that connects cell towers and the telecom company's network) with no state standard applicable to all cell towers.

It also found that utility pole ownership is spread out among electric utility companies, telecommunication companies, jointly between electric and telecommunication utilities, and by other third party entities.

Recommendations

The panel recommends creating an enforcement division within PURA to serve both PURA and the Siting Council. This division will be responsible for reviewing open orders; investigating potential violations of the orders; negotiating administrative penalties; and, if necessary, referring violations to the office of the Attorney General. The report notes that creating the division will require additional personnel and funding.

The panel also suggests that the state, the utilities, and a university, or other third party expert, collaborate to create an interdisciplinary center for research on storm hazard mitigation and power system resiliency. Legislation would likely be necessary to fund the center,

specify where it will be housed, and describe how it will relate to other state agencies and departments. The center would:

1. develop better hazard assessment capabilities that can identify “hot spots” for storm damage and integrate early warnings with preparedness and emergency management;
2. conduct research on hardening the present utility pole and wire infrastructure;
3. perform life cycle analysis of the cost of undergrounding utilities;
4. evaluate the use of cogeneration and microgrids to improve the electrical distribution system’s overall reliability and resiliency;
5. evaluate the use of alternative energy as part of a more resilient power system;
6. perform research on regulatory reform and energy infrastructure financing; and
7. leverage available Federal Emergency Management Agency (FEMA) funding by becoming a regional center of excellence for storm hazard mitigation.

The panel also proposes that the Siting Council (1) require continuity of service plans for any future cell tower and (2) where possible, issue clear and uniform standards for generators, battery backups, backhaul capacity, and response times for existing cellular towers. The council currently does not have jurisdiction over facilities once they are built.

Regarding utility poles, the panel proposes the creation of a “pole administrator” position within PURA to manage utility pole rights-of-ways, aging of utility pole infrastructure as reported by pole custodians, and other issues associated with the reliability of utility pole infrastructure. Although this would not require legislation, it could specify the administrator’s powers and responsibilities.

Lastly, the panel recommends that DEEP investigate the physical and fiscal issues related to developing distributed power generation systems in critical areas and “town centers.” The investigation would include establishing energy improvement districts, use of microgrids, and ways to address issues related to crossing rights-of-way.

COMMUNICATION & INFORMATION SHARING

The panel reports that municipal officials and first responders repeatedly testified about the confusion and conflict between municipal priorities and the utilities' desire to restore service. It finds that utility liaisons assigned to work with municipalities often had no prior knowledge of their assigned municipality, no access to information on power restoration timetables, and no way to find out when work crews would arrive, when lines would be cleared from roads, or when power would be restored.

It also determined that there was a lack of accurate information about power resumption that affected all consumers and businesses throughout the state. In particular, this limited the ability of hospitals and other healthcare and human service providers to provide continuous services and resulted in service inefficiencies such as patients staying in hospitals longer than necessary because they didn't know if their power or phone service had been restored.

Recommendations

The panel recommends that utility liaisons be trained to understand their assigned municipality's position and activity within the overall grid and be able to give accurate, non-inflated, and up-to-date information on the timelines for power restoration. The liaisons should also be pre-assigned to each municipality so that he or she can participate in emergency preparedness exercises and become familiar with key municipal staff and priorities.

The panel suggests that the electric utilities' be able to provide timely, accurate information about power restoration projections. This would allow (1) patients to be safely discharged home, (2) individuals with medical needs to safely remain in their own homes, and (3) healthcare providers to better allocate healthcare staff resources. The panel also proposes the creation of regulatory standards on providing information about the resumption of telecommunication service. The panel also recommends that municipalities and utilities coordinate their restoration efforts so that individuals served by community provider organizations (organizations that support individuals with disabilities and significant challenges in community-based settings) can continue to receive services in their own homes or in provider service delivery locations rather than in municipal shelters, nursing homes, hospitals, or other more costly levels of care.

MUNICIPAL ISSUES

The panel finds that as an overall strategy, municipalities should be able to protect their most vulnerable citizens for up to five days in a row with no real assistance from any outside entities.

It also reports that while clearing roads was a top municipal priority immediately following the storms, there were many delays caused by a lack of utility resources and coordination. While municipal public works crews could clear roadway debris, their access, and emergency vehicle access, was often limited and delayed by downed wires, which can only be moved by individuals trained and approved by the electric utility companies. The panel determined these companies must plan and work with municipalities to ensure public safety by getting roads cleared as quickly as possible.

Recommendations

The panel recommends that municipalities be able to delineate a “town center” in which they can mandate the inclusion of alternate power sources (including distributed generation) for private facilities such as gas stations and grocery stores.

The panel also proposes that utilities and municipalities work together and expend appropriate resources to ensure that sufficient technicians and resources are available to each municipality to ensure proper and prompt roadway clearance.

GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

The panel reports consistent complaints on the difficulty of determining what streets were blocked, what poles and wires were down, and where power was on or off. They determined that a common GIS platform that could share information about storm assessments between towns, utilities, and state agencies would help address these problems. While some towns and utilities are gathering the data needed to implement such a system, none have completed the process, and there is no single statewide entity with authority over implementation standards for applying GIS information to storm-response applications.

Recommendations

The panel recommends that the existing Connecticut GIS Council expand its membership to include the state's investor-owned and municipal utilities. Membership on the 21-member council is defined in [CGS § 4d-90](#) and presently consists of the heads of various state agencies and municipal and regional representatives. It coordinates GIS capacity for the state and provides technical assistance to towns and regional planning agencies.

The panel also proposed establishing a division in the Office of Policy and Management (OPM) that would work with the state's various emergency management entities, water and wastewater facilities, and utility companies to synthesize available GIS information and provide it to the Department of Emergency Management and Homeland Security (DEMHS) for integrated and uniform planning purposes. The panel further suggests that all councils of government, utilities and others should be mandated to regularly report their respective GIS updates to this division.

The panel suggests that PURA require all electric utilities to develop GIS applications that incorporate information from smart meters/smart grids and mobile data terminals to facilitate the real-time sharing of data on service outages. It also recommends that utility companies provide local emergency operation centers (EOCs) with circuit maps, piping maps organizational flow charts, escalation paths, and up-to-date information on service outages within two hours of an EOC opening.

CLIMATE CHANGE & RISING SEA LEVELS

The panel finds that a strong Category 3 hurricane is the most probable worst-case natural disaster scenario for which the state should plan. While Tropical Storm Irene downed 1-2% of the state's trees, a Category 3 hurricane could down 70-80% of them, black out the entire state with some areas losing power for over a month, and cause an estimated \$54.2 billion in damage.

The panel also reports that weather and climate studies indicate that (1) the state is overdue for a major hurricane, (2) precipitation has greatly increased over the past 40 years, and (3) sea levels are anticipated to rise by approximately 1.5 feet over the next 40 years and from 3 to 5 feet by the end of the century.

Recommendations

The panel recommends that the Department of Construction Services collaborate with the DOT and DEEP to develop new engineering standards better suited to protect against the effects of extreme weather. The standards would subsequently be incorporated into the State's Building Code.

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