STATE OF CONNECTICUT
GOVERNOR DANNEL P. MALLOY

The Two Storm Panel
Special Meeting Minutes
Friday, December 2, 2011
Room 1D, Legislative Office Building – 9:30 a.m.

Members Present: (Co-Chair) Joe McGee, (Co-Chair) Major General James Skiff, Peter Carozza, Terry Edelstein, Lee Hoffman, Scott Jackson, and Cathy Osten.

Members Absent: Robert McGrath

1. **Call to Order: Major General James Skiff** called the meeting to order at 9:32 a.m.
Lee Hoffman noted that both he and his firm personally represent Aquarion Water Company, and that he did not believe there to be a conflict. Still, he wanted to bring it to the panel's attention in case anyone disagreed.

2. **Panel 1 – Impact of the Two Storms on Water Supplies and Waste Treatment Facilities:**
   a. **Hal Alvord, Director Dept. of Public Works, City of Norwalk:**

Hal Alvord said that their facility located in Norwalk has a levee with a height of 11 feet. There was discussion of surges expected to be as high as 13 feet. That, combined with excessively high tide, created an expectation that the water could overflow the facility. They made a decision to evacuate the facilty, and functioned well from their temporary location. The wastewater treatment plant was not evacuated, as there is no alternative. Hal Alvord said they moved equipment away from the 11 foot overflow area. If water were to enter the plant, they had the ability to turn off equipment. Residents were informed that if the treatment plant was out of service, they should not operate their toilets. If the plant was shut down, the waste would end up in Long Island Sound.

The key criterion for the plant is the elevation where the water flows out into Norwalk Harbor, which is seven feet above sea level. Ultimately, the water was a little less than a four foot surge, with less than one foot of that location having overflow.

Hal Alvord said that they do have backup power generation from the 1970's at their location. They could run most of the process, but not carry the entire plant load. A $40 million project will be completed in January with a 2-megawatt machine that will carry the entire facility.

Twenty of the twenty-two pumping stations in Norwalk have backup generators. One pumping station in the Bell Island portion of the city was lost. The generator came on, but the surge came in and shut that down. It was restored in approximately 30 hours. People were not flushing their toilets, so there was not a big problem.

Joe McGee said that the panel is looking at a CAT 3 storm and asked what the impact would be in that situation.

Hal Alvord said that they would be shut down and the waste would flow into Long Island Sound in a CAT 3 storm. The only way to minimize this impact is to convince the residents not to use the treatment plant should it get shut down in this kind of situation. The plant can handle up to 30 million gallons per day in a storm flow situation. Everything after a maximum of 33 million gallons per day gets some small grip removal and is released with very high chlorination in those storm flow situations. Communications are then sent to shellfish facilities in the area.

Joe McGee asked in terms of planning, how does one plan for a serious storm with these considerations

Hal Alvord said that given the facility as it exists today, there is nothing they could do that would prevent the plant from being flooded in the near term. Adding a foot or two to the entryway would impact the hydrolic profile.

Joe McGee said that they have had testimony that sea rise level is real and that by the end of the century, the increase will be three to five feet. He asked how they could be assured that Norwalk is preparing for that eventuallity.

Hal Alvord said that they have an emergency response plan but they could not reassure them, nor could any other waste treatment facility reassure them. Their current project of improvements on the plant, specifically the second phase, could include something to change the hydrolic profile of the plant. The cost could be up to $80 million for that project, which might be unaffordable for the City of Norwalk.

Joe McGee asked what recommendations he would make to the Governor in their position.

Hal Alvord said that the formula for which clean water funds are apportioned to communities should be reevaluated. The debt service that Norwalk would need to take on improvements would require a high increase in user rates. Perhaps incentives to communities should be addressed.

Cathy Osten asked if the sewer is segregated from the catch basins in the community.

Hal Alvord said that as they repave streets or separate them, they are making progress. There is a very minimal combination at this point.

Major General James Skiff asked if they have drills on their emergency plan.

Hal Alvord said that they do tabletop exercises, but Irene was their first opportunity to evacuate their public works center. They have done limited exercises at the plant as they can't shut it down for exercises.

Lee Hoffman said that as they are looking at hardening the shorelines, would it be easy to raise the levies or would it be prohibitive?

Hal Alvord said that nothing is prohibitive and that they have had serious issues with their storm draingage system. Anytime you put a new pipe in, you would need a permit from DEEP. That processing time has come down significantly and they have a great relationship with DEEP.

b. **MDC Hartford:** Scott Jellison, COO: Scott Jellison presented to the panel members (see attachment A).

Scott Jellison said that they have some recreation centers for the public to use and maintain 30,000 acres of land for their watershed facilities. As with most utilities, their systems are 100 years old. The challenge is specifically how you operate the system, improve it in a reactive mode, and proactively improve it over time. It takes years of experience for staff to become experienced at what they do in the field. Their seven departments have emergency operation plans. In 2006, they did not have a command center which takes all of those departments to coordinate them together. It takes a lot of energy to be proactive, with developing the technology and buying the equipment. $3 million was spent to build the command center which was merged with their customer service center.

Scott Jellison said that they have implemented a computer control system that monitors their treatment centers and pumping stations which helps them to be proactive. They monitor their dams and facilities with security cameras. These improvements in technology help them to do more with less.

Joe McGee said that the communication issue between the crews and the main office has been an important topic for discussion and. he asked for MDC's input..

Scott Jellison said that the challenge they had was that all information goes through the command center, which is not making decisions for a department, but distributing the information. The crews have laptops and are entering data from the trucks which goes directly to the command center. In these storms, they had to use radios and in some areas cell phones, depending on the severity of the outages.

Joe McGee asked if they used mutual aid assistance agreements.

Scott Jellison said that they have not. They have developed a "wet weather team" which spends lots of time coordinating the emergency action plans. As every storm is different, they all affect departments differently.

Joe McGee asked if they bring in outside contractors.

Scott Jellison said that their approximately 600 employees do almost all of the work themselves. In severe cases, an emergency contactor could assist. The severity of the storm in question would dictate their response.

In severe cases like these past two storms, they house their staff at the command center overnight in anticipation of sending out the staff. In Irene they prepositioned generators throughout the week before as they had advance notice. All fuel tanks are topped off, which means that now their staff only needs to get there and they do not need large equipment.

Scott Jellison said that their staff was walking two miles on foot just to get to the facility.

Joe McGee asked how they handle overtime in these situations.

Scott Jellison said that they have the same 16 hour rule. In these storms they had people sleep at the command center and had 12 hour shifts. Employees were deployed from the command center instead of sending them home. The MDC is very good at responding to emergencies as the system is 100 years old and they spend lots of time doing it.

Joe McGee asked in Irene, how much of the customer base was out of power.

Scott Jellison said that during both storms, not one customer lost water or sewer. In a CAT 3 hurricane, their planning would not be any different. They are working on a $2.1 billion improvement plan on their facilities. Depending on the storm, they have strict flood control procedures. In Irene, the early prediction was the river getting to 24.5 feet, but it got to 28 feet. So, they needed to monitor the river carefully.

Joe McGee said that they have had testimony that the climate is changing, and so we are getting more rain which affects all of the engineering. He asked what was used in terms of engineering for the project.

Scott Jellison said that the entire concept of the project is to get the water out of their sewer system. In a bad rain storm, they could see more water than the system is currently rated for, which is why they are spending the money to improve the facility.

Joe McGee asked what happens to Hartford in a CAT 3 storm.

Scott Jellison said that every storm is different and the river's behavior is different. In the 80's, the river got to 30 feet. When the river is that high, it is 27 feet in Rocky Hill and that facility needs to be sandbagged. In these storms, they filled the sandbags and were ready to deploy

them from prepositioned locations. The dyke could be higher and you could move the sewage treatment plants on hills, buthe nature of the business makes them vulnerable.

The increased rain fall is an issue in terms of their work to monitor the river elevations and the flood control gates at 31 locations. The solution is to make the dyke higher. The MDC spends $8 million per year on electricity, with 80% of that being spent at the waste water facility.

Major General James Skiff asked about the impact from Irene.

Scott Jellison said that the rain during Irene impacted the combined system, which is being addressed in the improvement project. There were some outages, but nothing that was difficult to manage. Since the winter storm was so long, they had to keep working for an extended period of time.

Major General James Skiff asked what kind of generators they used.

Scott Jellison said that they use diesel generators and needed to pre-position the fuel tanks. The belly tank of fuel could run for two to three days. Additional fuel tanks were pre-positioned nearby for refilling later. The new generators from the new project are also going to be diesel.

Major General James Skiff asked if they cooordinate with any other utilities as part of the project.

Scott Jellison said that they spend a lot of time coordinating with other utilities. As they are running the project, they are also a utility that needs to service that construction.

Joe McGee asked if they are combining their work with other utilities.

Scott Jellison said that they are not housing other utilities within their pipes. This has been done in England for example, and they have had discussions for future opportunities. In a street project, other utilities have been reinstalling new conduits for themselves.

Joe McGee asked if it makes sense to combine the utilities in these situations. Clearly undergrounding has got to be an option. The cost gets reduced dramatically when the utilities are combined.

Scott Jellison said that on their projects they have been coordinating with other utilities to improve their infrastructure on those streets.

c. **Greater New Haven Water Pollution Control Authority:** Sid Holbrook, Executive Director: Sid Holbrook presented to the meeting members (see attachment B).

Joe McGee said that the issue of rainfall standards has been discussed. The standard is still a 1960 standard. He said that they would look into that with DEEP.

Major General James Skiff said that DEMHS has a radio program, but wasn't sure if utilities were part of that.

Sid Holbrook said that they needed to go out to contractors and pay for radios. He had previously approached the state and asked for radios, but was told that they could not get them. He was hopeful that would change.

Major General James Skiff said the panel will be looking at communications. He asked for confirmation that they were not connected to the state's EOC.

Sid Holbrook said that he receives the weather updates out of the EOC, and would like a more robust connection to the EOC. He also said that their system tells them what is going on in terms of their pump system, which operates through a radio system.

Major General James Skiff asked if there was anything for them to add in terms of upgrades.

Sid Holbrook said they are planning on spending about $5 billion on improvements. They work closely with Yale for creating streetscapes. He said he wasn't sure what UI was doing in terms of undergrounding. He said he didn't think there were as many outages in cities because of the lack of trees in those locations.

Cathy Osten asked if they had individual conversations with large manufacturers who use large amounts of water or disperse large amounts of sewage in a storm situation to operate differently during those events.

Sid Holbrook said that they don't have any large manufacturers. If they felt a large storm was impending they would have those conversations, but would not see them as necessary in a CAT 3 storm, as they would be able to handle it.

Hal Alvord said that in Norwalk they have several large manufacturers to consider. Both of those companies participate in exercises and beyond that, they coordinate with those companies.

Peter Carozza asked if they were part of the emergency operations center in New Haven but were unable to coordinate with the state EOC.

Sid Holbrook said they are unique as they have a board of directors which are appointed by first selectmen and mayors and operate autonomously and would like to see them treated as a municipality.

Major General James Skiff said that the electrical utilities have representation in the EOC and it seems that this is what he is asking for specifically.

Sid Holbrook said that would be correct.

d. **Aquarion Company:** Erik Bernard, Manager, Planning, and Emergency Response: Erik Bernard presented to the panel members (see attachment C).

Major General James Skiff asked Hal Alvord to write down his throughts and send them to the panel. He thanked the presenters for coming and for providing their thoughts.

Major General James Skiff called a short recess at 10:51 a.m.

Major General James Skiff reconvened the meeting at 11:03 a.m.

3. **Presentation by Witt Associates:** Charles Fisher, Vice President: Charles Fisher presented to the panel members (see attachment D).

Terrie Edelstein said that they summarize accomplishments with communications. She said that she wanted to focus on texting, as it was one of the only methods available to consumers. Her personal experience led her to a shelter, but that was the extent of it.

Charles Fisher said that efforts were focused on the restoration and not as much onthe communications with customers. This could be improved going forward.

Lee Hoffman said he would like to get more details about what they envision for more robust training, while they are ramping up their workforce and do not know the origin of that manpower.

Charles Fisher said the basis is planning, which starts out by asking how you would manage a workforce seven to ten times the normal workforce. The electric utility industry is fortunate in having a well-working system of mutual aid in their industry as the infrastructure is so similar. The better best-practices for utilities is to have information about their systems which might be difficult to provide to workers who are coming in on mutual aid.

Lee Hoffman said that he knew the 12 hour lag in communications was a problem. He asked how you increase the communication ability such that management knows what is going on and that the crews can communicate without compromising security in terms of homeland security.

Charles Fisher said that it was a good question and not particularly in the scope of the review. He said that they encourage people to be innovative and find different ways of accomplishing this, including just picking up the phone and making the call.

Phillip Webber said that most of the towns he interviewed had a good relationship with their CL&P account representative. They have provided communities with a hard copy of their most recent registered plan and train with first responders. He said they are talking about a more comprehensive approach to that.

Joe McGee asked if they could give the panel recommendations of communities who use best practices in terms of training. Florida does a real-time exercise before the storm season starts and they have made the recommendation that Connecticut could benefit from such training.

Phillip Webber said that is exactly what he is discussing. Regardless of the size of your town or state, there is a broad scope of hazard that could take place. Utility disruption is only one element of that. You don't start with a full scale exercise, but rather an agreement and work from there.

Joe McGee asked where Connecticut is on a scale of status.

Phillip Webber said that he wouldn't put it on a scale but would say that you start on a state level and drive the local governments in a cohesive effort. There are areas for improvement, so you can start with a state-wide program. The communities of Fairfax and the states of Florida and Georgia have regional approaches. New York and New Jersey also have such programs. EMAP also has some solid statistics on who is doing what, and also has standards to use while developing emergency management programs.

Major General James Skiff asked what system or organization works best in terms of where emergency management sits in the state.

Charles Fisher said that they have found that it depends on the environment in the state. They have been tasked with reviewing that question and wouldn't say there is only one recommendation. One consistent point they have made is that post 9/11 and Katrina there is an emphasis on emergency management.

Major General James Skiff said that the 800 MHz is a tower-dependent system and asked where that had been utilized around the country, as the towers could withstand 120 mph winds.

Phillip Webber said that he believes it has worked very well. Southeast Georgia has a robust 800 MHz strategy. It is a big capital investment, but he believes that it has transformed emergency management. Being able to update the incident action plans on a timely basis is critical, as well as driving information out to the public.

Major General James Skiff said that in our state it shouldn't be as hard to find the coverage from the tower system. This communications piece has become a large issue for the panel.

Joe McGee asked how they were supposed to look at this performance in terms of standards for restoring power. He asked what the benchmark should be for restoring power.

Charles Fisher said that their own internal model predicted that they would be back by Wednesday, and 99% by Sunday. That message then became the public goal. It will depend on the type of event. There were 8,000 or 9,000 customers without power at any given time. There were customers who were without power multiple times, which is pretty unique. Again he could not give a specific standard, as it would depend on the event. They recommend in their report that the regulatory process looks at how it interacts with emergency management in large scale restoration process. This is a legitimate question, but it is not one that they considered at in this review.

Joe McGee asked what the priorities were in the storm for utility. Towns would say they were getting the roads open. He asked for them to expand on what the first priorities should be.

Charles Fisher said that the topic of restoration priorities is a primary issue in this case. Some mayors were saying that the utility did not know what the restoration priorities were, but they found that in some cases the mayors themselves did not knkow what the priorities were. For the most part there is agreement between the towns and utilities on what those priorities are or should be. During such an event, you will have officials or community leaders saying what their priorities are, but more important is that you should identify who will be dictating the priorities in communities.

Charles Fisher said that training is an understanding between all on what their priorities are. Some in a community said they could not see trucks in their town working, but in actuality, some trucks were working outside of their town on a circuit which then restored power to that area.

Peter Carozza asked for them to go into more detail on the pre-positioning of assets, where they were coming from, and what assets were on the ground here.

Charles Fisher said that the Company's internal staff was put on call before the event. They have contractors available to them and mutual aid agreements available to them. The company called on those assets. Part of the problem is that you need to convince other utitilities to come help you while they are getting pressure to stay locally. CL&P pre-positioned thirty contract crews from New Hampshire, but they did not pre-position their internal staff.

Lee Hoffman asked if they asked CL&P why they communicated the internal stretch goal.

Charles Fisher said that some officials in the company were confident they would make the goal and others thought they had some doubts. In summary, the company put that information out there and decided to keep with it. They were dealing with expectations with the public and communicating with the workforce. In this major effort they were trying to drive them hard to get the work done and keep the pressure on to get the work done.

Joe McGee said that in the Jacobs Report it was suggested that the relationship between labor and management needed to be improved. He asked what they observed.

Charles Fisher said that they observed tension between management and labor, though that wasn't something they looked at specifically.

Scott Jackson said that during Irene total crews peaked on day 7 and during the snow storm they peaked on day 9. There were some concerns that CL&P couldn't get crews in on time, possibly due to failure of payment from previous storms.

Charles Fisher said they reviewed invoices and didn't find any evidence that that issue affected overall performance.

Leff Hoffman said that Irene was a larger scale storm in terms of a regional impact whereas the October storm only impacted a handful of states. It seems that it would have been easier to get crews in more quickly. He asked if there was a reason for the lag that was given.

Charles Fisher said they did not look into that specific question. When you look at both events it goes back to that initial preparation time. In terms of Irene, you are preparing days in advance. That was not the case for the October storm.

Joe McGee asked what the appropriate time frame would be for storm assessment.

Charles Fisher said that would be pretty expensive to combine those systems. There were instances where local communities had information on damage, but there was no standard or format or protocal to communicate that information and input it into their systems in an effective way to make a substantive difference in the restoration efforts.

Major General James Skiff said that in their report he noticed the failure to address ESF12, and that would be a deficiency of all involved as it is not even in the plan. He asked if they would agree with that point.

Phillip Webber said that he would agree and that is the point they are making. It makes sense to train to that level. UI talked about the need to revisit their plan and make it more of al iving document. CL&P's plan has been revised many times and as recently as June 11th.

Joe McGee said that in our disaster plan we use a CAT 3 storm as the standard for which we should prepare. He asked what they have found in terms of what the standard is elsewhere.

Phillip Webber said that their focus was not the entire emergency management plan, but rather the utilities and the disruptions. Emergency planning is about leveraging capability. It would be to your peril to pick a specific standard. You should leverage your complete capability in terms of technology and staffing, etc.

4. **Break:** Major General James Skiff called for a recess at 12:15 p.m.
   Joe McGee reconvened the meeting at 1:12 p.m.

5. **Evolution to the Intelligent Grid - Smart Grid Possibilities:** Kenneth Geisler, Vice President, Strategic Services, SIEMENS: Kenneth Geisler presented to the panel members (see attachment E).

Joe McGee said that the smart meter would be able to show a control center when power is no longer flowing to the house or structure.

Kenneth Geisler confirmed that this is true.

Joe McGee said that the meter is a large advantage to the company in terms of its operations and an advantage to consumers as they can save some money.

Kenneth Geisler agreed on both points, along with the ability to extrapolate additional data and possible efficiencies for operation. In a storm, infrastructure would be damaged and communications will go down. With loss of power, the meters will omit a final transmission saying that it no longer has power.

Joe McGee said that the smart grid opportunity here is that it speeds up the assessment of the damage, allows us to locate crews to repair it more efficiently, and also automatically fix outages in some cases. He asked how far Connecticut is away from this technology.

Kenneth Geisler said that generally these devices are placed in the existing infrastructure, coupled with the control center at the utility and the smart meter at the home.

Joe McGee said that you aren't undergrounding the utilities, but rather just making advances with the pole and wire system.

Kenneth Geisler said that is correct. Still, undergrounding does help. The utility designs are moving toward a more automated structure. They have a predictable income and budgeting process. He said that it was his opinion that this is a multiple year change process, possibly twenty years worth of work in some cases for full integration.

Cathy Osten asked how the funding source from his examples is made available to cities and states.

Kenneth Geisler said that he knows the ARRA funding for the grid is mostly done at this point. Still there is funding currently ongoing for these kinds of things. As a vendor, they don't get as involved in the funding.

Cathy Osten asked if it was possible to install meters in homes or critical facilities that could give the utilities a better answer as to whether that particular area was out of power.

Kenneth Geisler said it would be a function of where you establish the communications, which would be done in blocks. In other systems, they have their critical customers identified in the systems. There are special devices which are more expensive, but they would plan on rolling that out with communications.

Lee Hoffman said that the grid is designed to be very secure. He said that he is mindful of Mike Davis proof that you could hack into smart meters. He asked how he would respond to the security concern.

Kenneth Geisler said that in general, the systems applied to the control centers and automation for the field are very secure and sophisticated. The meter is accessible, but there is not a lot you can do with that access point.

6. **Lessons Learned and Recommendations:**
    a. **Military Department:** Major General Thaddeus Martin, Connecticut Adjutant General and Brigadier General Gene Mascola: Major General Thaddeus Martin presented to the panel members (see attachment F).

Scott Jackson asked if they had any difficulties specifically with municipalities in not knowing how to request National Guard assets.

Major General Thaddeus Martin said that as the process is advertised, it should go to the state EOC with their need. The National Guard would then be asked if they could fulfill the mission. There were some folks out there who were not familiar with the appropriate steps.

Major General James Skiff asked how pentagon forces would be handled in a joint forces situation.

Brigadier General Gene Mascola said that a contingency dual status commander would be conducting command and control over any federal forces that are sent to the state.

Cathy Osten asked if debris clearance teams can work around down wires or if they need to work with the utility teams.

Major General Thaddeus Martin said that they do not have anyone qualified to clear the lines.

Major General James Skiff asked for them to give the panel a little background on the commodities distribution system.

Brigadier General Gene Mascola said that prior to the hurricane season they began the process of conducting an MDMP exercise and looked at what would be required to exercise POD operations.

Cathy Osten asked if they looked at the Department of Corrections institutions that may have been closed recently which could have the ability to unload large amounts of commondities.

Major General Thaddeus Martin said that yes, they did look at some, though he was not sure which ones. The FEMA size requirement is very large. He said he is a strong proponent of a centralized POD with delivery, so municipalities do not have to work to get to the commodities.

Major General James Skiff said that they would appreciate one of their best communications persons telling the panel what the National Guard brings to that capability.

    b. **Fire Commission:** Jeff Morrissette; Chief Edward Richards, State Fire Coordinator; and Mr. Higgins, State Fire Admin presented to the panel members (see attachment G).

Major General James Skiff said that his assumptions are that they would like someone to come back in to go into more detail for the communications pieces that they will cover at a future meeting. He said that they have a New England Emergency Mutual Assistance pact. Has there been any consideration to expand the territory?

Chief Edward Richards said that the FEMA plan is in the process of going national.

Cathy Osten asked if the database of assets has been updated.

Mr. Higgins said that he knows that it is regularly updated. If a town sends information into Web EOC, the most current map with assets is displayed.

Major General James Skiff asked what the current capability is for the five hazmat teams.

Mr. Higgins said that they are primarily staffed by fire departments, but staffed by DEMHS. Two of the five are 100% ready to go and train regularly within their areas, which are Hartford and Fairfield Counties.

c. **Connecticut Food Association:** Stan Sorkin, President, presented to the panel members (see attachment H).

Major General James Skiff said that he thought that his organization needs to be at the community level.

Stan Sorkin said that they have found by speaking to others that a member of his organization who would sit at the table at the EOC would be a point of contact to funnel information regarding openings or closing of roads for the transfer of possibly perishable goods to stores for consumers. This industry-wide communications channel would provide up-to-date information, which they have not had in the past.

Major General James Skiff said that the local merchants need a seat at the local EOC, and he agrees that he should have a seat at the statewide EOC.

Stan Sorkin said that one of the things they benefitted from was a list of the local EOC's. They were able to get the local stores to connect with those contacts directly to get priority for restoration.

Terrie Edelstein said that she thought his testimony was very apt for language that could apply to one of the charges they try to grapple with in terms of good communications.

Major General James Skiff said that only one grocery store was open. He asked if that was the average for the state.

Stan Sorkin said that the Stop & Shop chain is well prepared with generators. Incentives would be helpful to assist the other stores in preparation.

7. **Adjournment:** Lee Hoffman moved to adjourn at 3:53 p.m., seconded by Cathy Osten. All members present voted in favor. The motion carried.

Attachments

A. **MDC, Planning for Storm Irene and Storm Alfred, Governor's Two Storm Panel**
B. **Testimony of Sidney J. Holbrook, Executive Director of the Greater new Haven Water Pollution Control Authority to Governor Malloy's working Group Two Storm Panel**
C. **Testimony of Erik Bernard, Manager of Planning for Aquarion Water Company, December 2, 2011**
D. **Witt Associates, October 2011 Snowstorm power Restoration Report**
E. **Siemens Evolution to the Intelligent Grid: Smart Grid Possibilities, Ken Geisler, December 2, 2011**
F. **Testimony of Major General Thaddeus Martin, Connecticut Adjutant General**
G. **Statewide Fire-Rescue Disaster Response Plan, The Connecticut Chiefs Association in cooperation with the Commission on Fire Prevention and Control**
H. **Two Storm Committee Testimony by Stan Sorkin, President, Connecticut Food Association, Friday, December 2, 2011**

Submitted By:

Mike Caplet

MDC

Planning for Storm Irene and Storm Alfred

Governor's Two Storm Panel
Retired Air Force Maj. Gen. James Skiff
Joe McGee

MDC Reorganization to become proactive rather than reactive

- MDC , under new leadership with CEO, Charles Sheehan, began reorganizing its Operational Departments in 2005/2006
  - WHY; long rang planning is necessary to eventually be able to respond and apply appropriate resources to major emergencies, the more organized we become the more time can be spend on preparation for Major Storm events
    - Operations maintains and operates 1200 miles of sewer, 1500 miles of water distribution in addition to; serving WH,EH,RH,Weth.'Hartford,Winsor,Bloomfield and Newington
      - Provides drinking water and sewer service to population of 400,000
      - Emergency repairs and maintenance of our infrastructure
      - Town/state paving program- renewals, point repairs, depressions
      - Water Meter Program
      - Maintain 30,000 acres of water shed lands
      - Maintain 40 billion gallons of water source reservoir
      - Maintain Public access for Recreational purposes at our MDC facilities
- Operations did not have enough crews to complete the backlog of non emergency work
- MDC was about to embark on a $200 million per year Clean Water Project and Asset management program which would stress existing resources
- MDC would not only be executing a $200M Design and Construction program but as a utility co. would be responsible and need to support the coordination of relocations and conflicts with MDC infrastructure just as would the CNG, AT&T and CL&P.

Reorganization/Staffing Changes

- 50% MDC skilled craft work force was within less than 9 years of retirement; a succession plan need to be developed
- MDC was comprised of 7 operational departments all competing for the same financial and staffing resources both for planned work and emergency management
- It is impossible to overcome the backlog with staff increases alone, MDC understood we needed to become organized thru Combining Customer Service Center with the new Emergency Command Center
- **Takes much more energy and effort to become organized , implementing new technology, procedures and equipment, while maintaining and operating an infrastructure which is 100 years old.**

Organization

- Merged Customer Service and the Emergency Command Center to create a complete new *EMERGENCY COMMAND CENTER*
- As a result, MDC added 14 new positions for maintenance and repair in 2007
- Additional staff to the day shift which allows a 1st responder to investigate prior to pulling Repair or Maintenance staff off prematurely for planned activity
- Added 2 full repair crew to repair
- Added engineering staff to manage Operations responsibilities

Emergency Command Center

- The ECC group has been expanded to organize and allow other Operations Departments to become *Proactive* rather than *Reactive*
  - New Command & Control Center
  - All alarms throughout MDC are received at the ECC
    - SCADA for Water Tanks, Pump Stations, Waste Water and Water Treatment plants
      - Provides real time information on system operations, power failures, pump and generator run time
    - Security Cameras from Dams to Treatment facilities received at ECC
  - Emergency Response Protocols; Wet Weather team
  - Coordinate all Departments EAP's
  - We implemented communicate and prioritization of scheduled work and emergency response with all Departments thru SAP Work Orders

ECC cont.

- Improve Technology
  - Develop work order systems which could be implemented in the fields by operational crews eliminating redundancy with information updating our data bases real time
  - Integrate GIS and oracle data base on Operational Crews lap tops in field
  - We have centralized Inventory staff under CEM for continuity of process with all other Departments which allows;
    - Develop CMMS (Commuter Management Maintenance Systems) programs; Work Orders are the basis for documenting the repair and maintenance activity to the Collection and Distribution systems which will be the essential information utilized in Asset Management
    - Developed Asset Management system for MDC Water Distribution system based on break history from real time data

Wet Weather Protocols

- Put in place in 2008, issued by Command Center
- Every storm is assessed based on its characteristics since each storm is different and will effect different departments
- All MDC towns are included in the wet weather team preparation activity
- Protocols 1-6 for various severity weather events
- Actions driven by type of storm and intensity of storm
  1. ¾" – 1 ½" Rain Event
  2. >1 ½" Rain Event
  3. >1/2" Rain & Wind >30 mph
  4. Rain Event which causes CT River > 8'
  5. Winter storm events w/ snow accumulations > 3"
  6. Hurricane or Tornado Event
- Major events
  - Plan for crews to stay on site for duration (food & lodging)
  - Stage generators at pump stations

Flood Control

- As part of our Flood Control Procedures, the MDC Operations Department is responsible to monitor the Ct River elevation and coordinate with the City of Hartford for specific inspections and tasks at 31 locations thru out the Combined Sewer System
- These tasks are clearly defined as to outline MDC and City responsibilities involving checking and closing of flood gates, operation of Flood Pump stations and installation of stop-log structures for penetrations thru the Hartford Dike Flood Control structure.
- As for the past 5 years, MDC ECC has included the City of Hartford, as other member towns, in our proactive Wet Weather meetings, which in part, monitors and tracks storm events including implementations of the Flood Control procedures.
- Each storm is coordinated with the Cities responsibilities as required based on each level of the River elevation.

Flood Control Plan (cont'd)

- Armory Corp certifies flood control structures with the City
- Inspect drainage structures, Open/Close & visually inspect sewer gates at various river levels, begin pumping operations on sewer plant effluent lines and fill/install sand bags at sewer treatment plants (Rocky Hill) if needed

MDC Water system consists of 3 major reservoirs all serving water to our water treatment plant by gravity. With 95% of our customers being unaffected during power outages. Our Sewer system is comprised of 4 waste water plants , with 90% of our customers served by gravity. Therefore MDC has pump Stations servicing remote locations;

- Total Pump Stations
  - Sewer - 71 Pump Stations
  - Water - 18 Pump Stations
- Permanent standby Generators
  - Sewer – 36 Generators
  - Water – 16 Generators or Diesel Pumps

❖ Small Sewer Pump Station – small sewer pump stations which do not have a generator. Vactor trucks are used to remove sewage 1-2 times a day from small pump stations during outages

Generators

- Over the past 2 year s we have identified generators to 36 stations which are in need of replacement. **A contract to install 17 stationary and four portable emergency generators is in the process of being awarded (Contract 2010-13, $3,043,408). This project is expected to be completed by September 2012.** Contract 2009-78 ($357,130) which was for installation of 2 critical emergency stationary generators for Wethersfield Trunk and Farmstead Pump Station was completed in September 2011.
- MDC CEM maintains 8 portable generators
- Permanently mounted generators at all plant facilities and pump stations undergo a weekly load test
- Suppliers – H.O. Penn, Cummins Metro, Sunbelt Rentals

Preparation for Tropical Storm Irene; ***Hurricane IRENE***, has been predicted by the USGS to raise the elevation of the Ct River to peak at 24.2 feet by Tuesday August 30, 2011.

- Storm preparation began Tuesday Aug. 23
- Eye of storm hit CT Sunday aprox. 2pm
- Held multiple preparatory meetings with all staff several days in advance
- Reviewed water release plans at MDC dams with US Army Corps of Engineers
- Obtained and prepositioned 19 portable generators at pump stations prior to storm
- Topped off all fuel tanks and received bulk fuel deliveries prior to storm
- Positioned fuel trucks throughout District facilities
- Closed recreation areas prior to storm
- Prepared 10,000 poly sandbags for support to MDC towns and District facilities
- Monitored river elevations at critical points ever 1hr
  - Rocky Hill WPC, surveyed flood waters to verify-historical data
- 14 chain saws fueled and tested, logging truck brought to Maxim Road
- Radios distributed to critical staff and member towns
- Topped off all water storage tanks before storm
- Exercise to install flood control stop log in City of Hartford Dike

Preparation for Tropical Storm Irene

- Active construction sites inspected, made safe and secured against high winds and flooding- closed projects down on Frid.
- All MDC facilities inspected prior to storm
- MDC Purchasing Agent remained at Operations throughout storm for emergency purchases
- 4 MDC Police remained at Command Center to provide emergency response and police escort
- Issued updates every 1hoursto critical staff regarding storm related issues, facilities without power, etc.
- **Conducted conference calls with critical staff every 4hrs before, during and after storm- included town managers DPW directors and Katherine McCormick of CREPC**
- 6 Sewer Maintenance/Repair/Gate Valve Crews and 12 Plant/Pump Station Crews remained stationed at MDC facilities throughout storm; cots & food provided
- MDC liaison staff stationed at CT State Emergency Operation Center throughout storm and the week following the storm
- Emergency Command Center monitored all emergency power and distributed information including last fuel/capacity/alarm status

Preparation for Winter Storm Alfred Different type storm

with 9 " of heavy snow with severe wide spread outages predicted

- Friday October 28, MDC prepared to mobilize equipment and staff for Storm Alfred,
- MDC Wet Weather Team initiated Protocols and put in place necessary staffing and equipment to proactively deal with the impending storm.
- Departments were notified to place personnel on standby to respond to the upcoming winter event.
- MDC rented 34 portable generators and purchase an additional 5 generators
- Pump station crews and Repair crews were all housed overnight at the Command Center in order to respond, while CEM and Riverfront crews were put on Standby and began to prepare and deliver equipment to our remote facilities.
- Maintenance teams were pared with electricians and technicians to tie in portable units throughout Friday night and Saturday.
- Both the Command Center and the Maintenance Department were closely monitoring the event through our SCADA alarm system centralized in the Command Center.
- By midnight Saturday the MDC had lost power to the following facilities:
    1. Barkhamsted HQ
    2. Reservoir 6
    3. West Hartford
    4. Collinsville
    5. Rocky Hill WPCF
    6. Poquonock WPCF
    7. East Hartford WPCF
    8. 71Wastewater Pump Station
    9. 18Water Pump Stations
    10. 3 Water Storage Tanks

Preparation for Winter Storm Alfred

- MDC crews in some cased walked in 2 miles to our remote facilities on foot, to operated prepositioned equipment
- 36 hours into the storm, we had relieved 50% of the maintenance personnel to rest and continued 24 hour operations with two twelve hour shifts.
- Water service was never interrupted to any of our customers.
- Monitored Generator operation status/fuel tank elevations at ECC
- Topped off all fuel tanks and prepared vehicles for snow plow/sanding
- Reviewed and made safe all active construction sites
- Reviewed and identified roadways with steel plates in member towns for snow plow drivers
- Added hay bales around temporary water main connections for insulation and marked areas with cones & barrels
- Monitored issues at state EOC via use of WebEOC

Emergency Preparedness

- Maintain emergency action/response plans for all facilities, updated annually
- Review inundation maps and evacuation plans for all dams with at-risk towns- Annual 1year Goodwin Dam with Cities, state police 1st responders Dec. 8
- Meet regularly with towns to update emergency contact lists, coordinate meetings prior to large weather events, especially with city of Hartford for Flood Plan
- Participate in tabletop exercises for FERC Dams every 5 years
- MDC police coordinate with Dept. Homeland Security for alerts, reports
- Use MDC lands to facilitate training for CT National Guard, SWAT teams, police departments
- Conduct After Action Reports (AAR) and other analyses after events to record what worked and where changes are needed
- Train Command Center staff on use of CT DEMHS's Web EOC system
- Created Water Distribution Operation Plan to record tacit knowledge of water system, normal and emergency operation, summarize and train current future employees

WebEOC / CREPC

Quick Summary of WebEOC

- WebEOC is an on-line Emergency Operations Center run by DEMHS. Prior to or immediately following an emergency event, DEMHS will create an incident for user to log in under. WebEOC then keeps a log of all organizations and users who log into the system. WebEOC issues continuous updates of the status of shelters, hospitals, weather updates and it includes statewide organization status reports every 4 hours. It provides links to many valuable on-line resources including flood mapping, weather, river projections, traffic cameras, etc. Also, if the MDC ever needed help with an issue during an emergency event such as a bulk fuel deliver, that request could be processed through Web EOC. The formal request would be placed in Web EOC, then monitored to see if the request had been approved and assigned to either a local organization, FEMA, Homeland Security, etc. Once assigned, there would be information added regarding a point person responsible for fulfilling the request and their contact information.

Quick Summary of CREPC

- After 9/11/2001, all local communities were required to have Local Emergency Planning Committees (LEPC) to create all-hazards plans to address emergencies spanning from natural disasters to chemical spills and terrorist attacks. To satisfy this requirement, many local communities banded together and utilized regional planning authorities to create these plans. The Capitol Region Emergency Planning Committee (CREPC) acts as the LEPC for 28 cities and towns surrounding the Hartford area. CREPC also acts as a regional coordinator for emergency preparedness in Region 3, preparing the Regional Emergency Support Plan (RESP) to summarize resources and foster cooperation among cities, towns and industry in the Region 3 area.

- Under a major disaster, all requests need to be funneled through the state's emergency operations center.

(B)

TESTIMONY OF SIDNEY J. HOLBROOK, EXECUTIVE DIRECTOR OF THE GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY TO GOVERNOR MALLOY'S WORKING GROUP TWO STORM PANEL.

Good morning Chairman McGee, Chairman Skiff and members of the Two Storm Panel. My name is Sidney Holbrook. I am the Executive Director of the GNHWPCA and joining me today is Gary Zrelak our Chief of Operations.

The GNHWPCA serves around 200,000 people in the towns of New Haven, East Haven, Hamden and Woodbridge. Our Water Pollution Abatement Facility is located on the East side of New Haven Harbor. We maintain and operate 30 pump stations and 550 miles of sewer lines.

Because of our location relating to Long Island Sound, we have for a long time had an emergency response plan in place. Since we were not affected by storm Alfred I will focus my testimony on Hurricane Irene. Prior to Hurricane Irene becoming a threat to Southern CT. We began monitoring its location and intensity by way of the State's Emergency Operations Center. Specifically through updates, and e-mails to us by Douglas Glowacki. Doug is a very compedent forecaster who I have known for many years going back to my days as Commissioner of the D.E.P. I believe the service provided by the

EOC is invaluable and would suggest that all utilities take advantage of the notifications!

When it was determined that Hurricane Irene would be impacting the GNHWPCA area. I convened a meeting with our staff to review our emergency response plan and to make all preparations necessary to deal with anticipated impacts of the storm.

Outside contractors where secured to perform works that may be needed beyond the capabilities of our operations personnel.

Thursday August 25, 2011

- Roof fixtures, loose items were secured and vehicle preparations, fuel and storage plans were followed according to the ERP.
- All vehicles, generator, and equipment were made ready, exercised, fueled and accessible prior to this event.
- Backup communication was obtained (2way radios) prior to this event in case cell phones went out of service.

Friday August 26, 2011

- A follow up meeting was held at 260 East St. Friday August 26th to discuss plans that had been implanted.
- Staffing and preparedness of the pump stations and the plant were reviewed.

- Friday plant wet well level was lowered to facilitate storm flow, main gate being lowered in a power failure condition.
- GNHWPCA attended a meeting and designated a representative to be located at the Emergency Operations Center (EOC) New Haven.

Saturday August 27, 2011

- Saturday August 27, at 10:30 am. A meeting was held at the EOC to discuss what each representative had done to prepare.
- Saturday August 27, a second meeting was held at EOC to inform all City officials and Utilities as to an update of Hurricane Irene.
- Prior to leaving for the EOC contact was made with the Operations Desk at the WWYP to ask them to turn on the two way radio as a backup.
- Saturday 8pm primary and secondary plant placed into storm flow mode with flows approaching 60 mgd.
- Saturday night the tow behind emergency generator tied into inlet works Rodney Hunt system to facilitate main gate lowering in the event of a power failure and tested OK.

- During the Storm communication between the ECO and the Operations Desk at the WWTP were maintained as reports from the EOC came in for power outages and flooding.
- There were reports from the Operations Desk that Communication had been lost with the SCADA system (EXPLAIN SCADA SYSTEM) at one or more of the pump stations

Sunday August 28, 2011

- Sunday 3am plant water strainers fail due to secondary bypass flow debris.
- Sunday peak flows reached 94.3 mgd about 12 noon, note Sat. and Sun. rain total recorded at East Shore was only 2.9" for both days.
- Operators were busy coordinating multiple power failure responses with collection and maintenance personnel in regards to the pump station during the storm.
- Our plant faired very well, but rain totals that were expected never materialized.
- All pump stations were visited and evaluated to assess damages and determine severity where needed portable pumps and generators were put in place.

Monday August 29, 2011

- Revisited all pump stations and re-evaluated conditions.
- The goal was t keep all pump stations running and keep bypass situations to a minimum.
- Outside contractors were called on to assist with the cleanup and operations of the GNHWPCA infrastructure.
- Over the next several days GNHWPCA continues to address issues with generators and pump stations.

Immediately following the storm those involved conducted a post storm analysis – the general consensus was that all that could be done by staff had been done and that we were fortunate in continuing normal service to our customers.

We have however indentified two areas where we feel improvements are necessary.

If a storm of greater magnitude were to come ashore and create a situation where we lost power – currently we have no ability on site to generate power to maintain our pollution abatement process. This issue however will be resolved hopefully within the next 2 years. We are presently undertaking an upgrade of our facility and as part of this upgrade is the installation of the emergency generator capable of supplying the energy to operate the plant.

The second issue relates to our ability to communicate with the State EOC. Currently we are not aware of a direct contact at the Center if a need arises that the State may be able to help us with i.e. radios, portable generators, potable water. It is our hope that after your panel has given its final report that this issue will be addressed. In conclusion I want to thank Gov. Malloy for empowering this panel.

To review what occurred during the two natural disasters and to make recommendations to improve services to the people of the State of CT. when we are faced with similar situations in the future.

GNHWPCA
Protecting the Environment

Greater New Haven Water Pollution Control Authority
260 East Street, New Haven, CT 06511 203.466.5280 p 203 772.2027 f www.gnhwpca.com

POST STORM REPORT by Maintenance Administrator

Hurricane Irene
GNHWPCA Lift Station Impacts

New Haven
Stations retaining power and pumping normally through the event
East St
James St
State & Union
West Rock
New Grand Ave

Stations impacted

Boulevard Power outage on Sunday. Generator transferred power and ran the station until power was restored on Wednesday. Area around station was flooded causing 40ft. rain barrel storage box to float blocking garage doors. Contractor in to move storage box and clean up debris on access road and parking area.

Long Wharf Station flooded with level reaching middle of control panel. Contractor implemented emergency pumping. Control panel has been evaluated with repair components placed on order. Panel scheduled to be restored by week ending 9/16.

Stone St. Power lost on Sunday. Portable generator brought to site and connected. Power restored Wednesday.

Humphrey St. Power lost on Sunday restored on Tuesday.

Market St. Power lost on Sunday with street flooding.

Old Grand Power lost on Sunday with street flooding. Power restored on Wednesday. Old Grand Station had issues with both pumps. Vac-trucks used to control station flow. Issues resolved on Saturday.

Mitchel Dr. Power lost on Sunday restored on Tuesday.

Truman Tank filled. Tank will need to pump down once interceptor level resides.

Morris Cove Power lost on Sunday restored on Monday. Generator transferred and carried the station pumping 16.5 mgd @ 135" in wetwell.

Fort Hale Power lost on Sunday restored on Friday. Emergency pumping implemented.

Quinnipiac Power lost on Sunday restored on Thursday. Generator transferred carrying the station during the event.

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Barnes Ave Power lost on Sunday for a few hours. Generator transferred and carried the station.

Woodbridge Power lost on Sunday. Generator started but didn't transfer. Found bad connection in switch which was corrected. Power restored on Wednesday.

East Haven

Cosey Beach Lost power on Sunday. Generator transferred and carried the station until Power was restored on Wednesday.

Meadow St. Lost power on Sunday. Generator transferred. Problem with CSI control panel electrical monitoring module which was repaired on Monday. Power restored on Wednesday.

Fairview No power outage. Lost channel grinder motor due to flooding. Station pumped for the duration of the event.

Minor Rd No power outage. Problems occurred with pumps Monday into Thursday.

Thompson Lost power on Sunday restored on Tuesday.

Main St. Lost power on Sunday. Portable generator brought to site and connected. Power restored on Friday.

Hamden

Arch St. Power lost on Sunday. Generator started and transferred.
Problem occurred Monday with generator engine failure.
Portable generator brought to site and till power was restored on Tuesday.

Stations retaining power and pumping normally through the event

Lovell
State
Welton
Mill Rock
Putnam

Old Chauncey – Power lost on Sunday. Generator transferred and carried the station.
Power restored on Wednesday.

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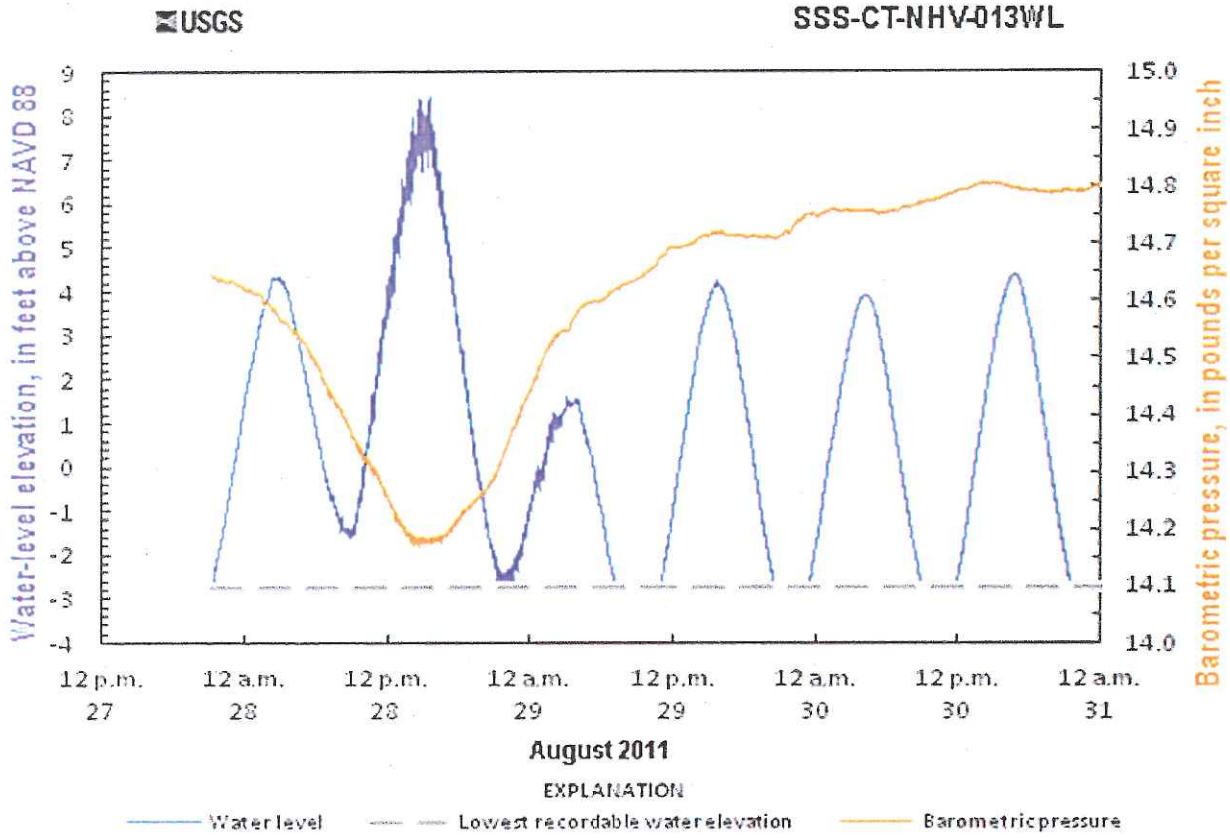
USGS

Hurricane Irene

SSS-CT-NHV-013WL
East Haven Coast Guard station dock



(C)

Governor Dannel P. Malloy
Two Storm panel Special Meeting
December 2, 2011
Room 1D, Legislative Office Building

My name is Erik Bernard. I am the Manager of Planning for Aquarion Water Company responsible for, among other things, emergency planning and response. The following testimony is provided in response to a request to share our experiences during the storms including how the storms impacted our operations, how we responded and what lessons we learned.

Aquarion Water Company is the public water supply provider for more than 590,000 people in 41 communities throughout Connecticut, as well as five in Massachusetts and three in New Hampshire. We are the largest investor-owned water utility in New England and among the seven largest in the U.S. Based in Bridgeport, we have been in the public water supply business since 1857.

Aquarion annually treats and distributes approximately 30 billion gallons of water to our customers in Connecticut. Over 90 percent of this volume is from impounded reservoirs located throughout the State, the remainder is from wellfields or is purchased from neighboring utilities.

Our typical mode of operation is to treat water at treatment facilities and then pump it to storage tanks and our customers located throughout our service territories. In many areas, due to large differences in topography, it is necessary to pump water to our customers through the use of strategically located pumping stations. Storage tanks provide system storage to meet peak demands, fight fires, and assist in maintaining service during power outages. We currently operate approximately 202 remote locations that require power to either pump, store, treat or convey water to our customers, 158 of these facilities are within CL&P territory and 44 are within UI territory.

These facilities are broken down by type as follows:

9 Surface Water Treatment Facilities

51 Ground Water Treatment Facilities

56 Pumping Stations

18 Storage Tanks

31 Meter or Valve Facilities

37 Administrative/Miscellaneous Buildings

Most of our facilities are designed with onsite backup power generation capable of operating our facilities through periods of power outages. These generators are designed with fuel storage capable of providing multiple days of backup power without the need to refuel. We also have three large trailer mounted generators that can be moved to locations in case of failure of backup power generation as well as numerous smaller portable generators capable of providing service to smaller locations. In theory, we can run our facilities indefinitely as long we are able to refuel our generators.

Aquarion began preparation several days in advance of Tropical Storm Irene and Storm Alfred. The following specific activities were performed by Aquarion in advance of the storms:

- "Topped off" fuel at all generators
- Developed a staffing plan for monitoring the situation
- Contacted our dam inspection consultant to put on standby
- Discontinued use of supply sources that are prone to flooding
- Ensured that chemicals were "topped off" at treatment facilities
- Notified contractors to be on standby for emergencies during the event
- Ensured that contact lists of emergency personnel were updated and distributed to all operating personnel.
- Mitigated any potential flooding issues by operating blow offs, or crest gates at dams to drop the level in anticipation of the heavy rain
- Stationed a maintenance person at each major plant
- Operating personnel took vehicles home to be available as needed
- Communicated with the Bridgeport Emergency Operations Center (EOC)
- Communicated with towns individually
- Contacted State agencies including DPH, DEEP and PURA in advance of the storm regarding planning

In general, our operational response to the storms went smoothly. As was the case with most of the electric customers in our area, we experienced significant power outages across our service territory. Each storm left over 90% of our facilities without power. The duration of the outages varied, from a matter of hours to as long as 15 days in one case. In the large majority of instances, our backup power generation facilities operated as designed. We lost communications with several storage tank transmitters due to loss of power and had to operate some pumping facilities locally by system pressure instead of by tank level. Our smaller systems, especially recently or soon to be acquired systems, lost power which required portable generators.

Aquarion weathered both storms and the subsequent power outages without any major customer outages. Approximately 60 customers were impacted during repair of a water main break caused by tree uprootings following Storm Irene and approximately 200 customers were impacted by a generator mechanical failure following Storm Alfred.

Aquarion incurred extensive overtime and expense related to the storm. This was primarily related to responding to alarms, clearing downed trees and snow, refueling smaller generators and operating treatment facilities that were running on generator power. We estimate that we incurred $190,000 in labor, material and fuel purchases associated with Storm Irene and approximately $240,000 due to Storm Alfred.

As part of our emergency preparedness program, Aquarion conducted an internal "lessons learned" exercise to review the actions taken before, during and after the storm events. The exercise included key personnel from various departments including operations, water quality and customer service.

The following Lessons Learned associated with the Storm Events were identified:

1) Deploy a sufficient staffing profile earlier. Consider having additional Operators and Call Center Reps. on standby. Determine availability of all staff.
2) Communicate with towns in advance of the storm. Provide them with our contact numbers. Consider using Liaisons or sending out blast emails.
3) Consider an upfront message to customers prior to the storm to summarize our preparation activities. Have someone on standby who can travel to our customer service center to do an upfront message in the event cell phone service is lost.
4) Develop a plan to fuel small-sized generators.
5) Communicate with the Answering service in advance of the storm.
6) Contact our electric utility Account Executives in advance of the storm.
7) Investigate/consider use of two-way or Ham radios if normal communications are lost.
8) Consider outfitting Trap Falls as an Emergency Operations Center.
9) Be prepared in advance to operate off of pressure when tank level transmitters are down.
10) Have additional smaller-sized generators on hand in advance of the storm.
11) Develop a Communications Plan with towns during the storm including electronic updates and Reverse 911 updates.
12) Have on hand a supply of 12 volt inverters that could be used in vehicles to run laptops and Toughbooks.

In summary, any emergency response equivalent to Tropical Storm Irene or Storm Alfred will test an organization to the limits. If there is not a " culture of service" embedded in your organization, you cannot create it in the middle of a crisis. At Aquarion for five consecutive years we have been awarded first place in the Public Utility Regulatory Authority's assessment of all utility companies by registering the fewest customer complaints per 100,000 customers. This is an enviable record and does not just happen. It requires dedication to customer concerns and means that in an emergency we can count on employees who understand the need to be responsive and go the extra mile as was the case during Storms Irene and Alfred.

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October 2011 Snowstorm Power Restoration Report

Presentation to the
Connecticut Two-Storm Panel
December 2, 2011

www.wittassociates.com

Agenda

- Introduction
- Scope
- Methodology and Approach
- Acknowledgements
- Findings
- Recommendations
- Q&A

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Introduction

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Scope

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Methodology and Approach

- Team
- Interviews
- Document requests and review
- Analysis
- Findings
- Recommendations

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Summary of Events

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CL&P Findings

- Restoration effort safety
- Accurate CL&P's restoration model
- Restoration crew performance
- Customer services
- Town liaison program

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CL&P Findings

- Worst-case scenario planning
- Leaning forward
- Auxiliary staffing
- Tracking restoration process
- Public communications
- Executive leadership
- Tracking restoration process
- Town Liaison program

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UI Findings

- About 15% of customers without power
- Worst-case scenario planning
- Situational awareness
- Estimated restoration times
- Scaling up for large events
- Communications
- Emergency Preparedness Plan update

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Comprehensive Findings

- Preparedness for a widespread power outage (planning, training, exercises)across all sectors
- Communications interoperability

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CL&P Recommendations

- Improve planning, procedures, training & pre-staging practices by increasing scale of planning scenarios
- In-depth review of the Incident Command System
- Improve information management
- Emergency management leadership

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Global Recommendations

- Connecticut utilities should more closely coordinate and integrate preparedness activities with state and local governments
- State and local government planning and preparedness should address major power disruption more comprehensively and inclusively

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Areas for Additional Review

- Mitigation
  - Vegetation management
  - System hardening
- Workforce issues
- Regulatory oversight
- Other critical services

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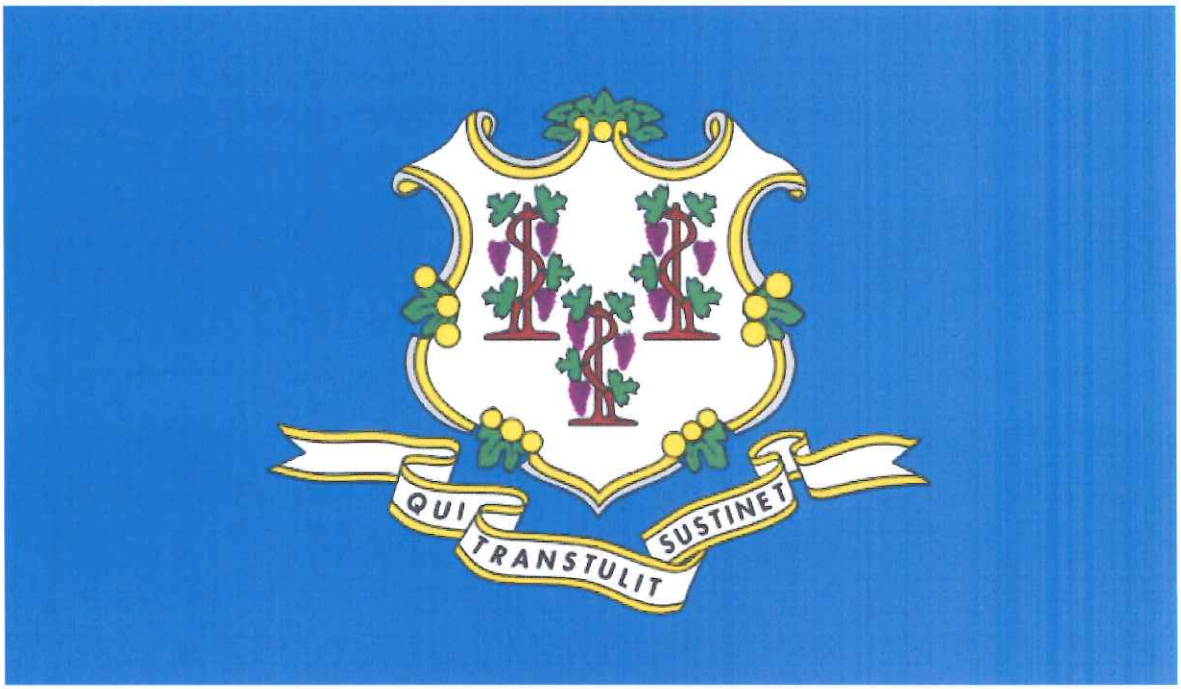
Connecticut October 2011 Snowstorm Power Restoration Report



Prepared by:
Witt Associates
December 1, 2011

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About Witt Associates:

Witt Associates is a public safety and crisis management consulting firm based in Washington, D.C., with consultants located throughout the country. Witt Associates has unrivaled experience and hands-on knowledge of emergency preparedness, response, recovery, and mitigation. Witt Associates bridges government agencies and non-profits with industry and citizens as they assist state and local governments to prepare for and recover from disasters and crisis.

Witt Associates is uniquely positioned to bring together policy architects and technical experts in public safety, with leaders from all levels of government and private sector partners to forge solutions to emergency management challenges.

Our team includes seasoned crisis and emergency management leaders with significant experience to provide consultation on key issues of public safety. The team is proficient in the details of emergency management, committed to the responsibility of the profession, and understands how crisis and emergency management work fits into a larger political and social climate.

Disclaimer and Disclosure:

This report prepared by Witt Associates was requested by the State of Connecticut. The opinions, findings, conclusions, and recommendations are provided solely for the use and benefit of the requesting party. Any warranties (expressed and/or implied) are specifically waived. Any statements, allegations, and recommendations in this report should not be construed as a governing policy, or decision, unless so designated by other documentation. The report is based on the most accurate data available to Witt Associates at the time of publication, and therefore is subject to change without notice.

Connecticut October 2011 Snowstorm Power Restoration
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I. Executive Summary

The northeastern United States was struck by an unusual pre-Halloween snowstorm on October 29, 2011. The wet snow – more than 12 inches in some areas -- stuck to the still leaf-laden trees bringing down limbs, branches and, in some cases, full trees. Fallen trees caused substantial damage to power lines, including some transmission lines, and blocked roads. More than 3 million electric utility customers lost power in the region. Eight deaths related to the snowstorm were reported in Connecticut. The snowstorm and power outage resulted in significant economic losses in Connecticut.

North Central Connecticut was hit especially hard, challenging the capabilities and coordination of electricity providers and public sector response. Almost 70 percent of Connecticut Light and Power's (CL&P) 1.2 million customers, lost power. Customers of The United Illuminating Company (UI), serving the coastal area, were not hit as hard, with a total of 52,000 of its 350,000 customers affected at some time during the outage.

This *Connecticut October 2011 Snowstorm Power Restoration Report* provides an independent assessment of the preparedness, response, and restoration efforts and offers recommendations for how capabilities to address such events can be improved.

The October 2011 snowstorm resulted in 809,097 CL&P customers being without power at some time during the 11-day outage; many suffered multiple outages. The duration of the power outage in some of the most heavily impacted areas caused inconvenience and frustration among the public and municipal officials. Community frustration was exacerbated by CL&P's communications with the general public and state and local officials.

This report provides a brief summary of the outage event, describes the methodology used to create this expedited evaluation, and presents key findings and recommendations for improving power restoration response. It is intended to provide a basis for further examination of key issues and improvement planning by the state, municipalities and utility providers. Although the performance of both CL&P and UI were reviewed and summarized here, the primary focus of this effort is on the CL&P service territory.

The October snowstorm resulted in the largest restoration effort in CL&P's history. Despite the length and extent of the service outages, and the effect on customers in the affected service areas, there were successes in CL&P's power restoration effort. The company's internal forecast model accurately predicted power would be fully restored by Wednesday, November 9, although an unprecedented army of mutual aid workers from other utilities was required to do so. No serious injuries or deaths were reported associated with the restoration effort. Municipalities reported that power restoration crews, once they arrived in their communities, generally functioned well and efficiently. Stakeholders also praised the assistance from power company customer service representatives in answering phone lines in a timely fashion, with an average wait time of less than

45 seconds;[1] this is frequently not the case in such a wide-scale event. CL&P's recently created Town Liaison program, while not completely successful in its implementation, is recognized as positive in concept.

UI outages were smaller in number and in proportion to their total customers. After the October snowstorm, all UI customers were restored by the night of Wednesday, November 2.

Summary of Issues

Findings and recommendations in this report address a number of issue areas:

- CL&P was not prepared for an event of this size. The worst-case scenario in the company's emergency response plan considered outages over 100,000 customers, or less than 10 percent of their total customer base. More than two-thirds of its customers lost power as a result of the October snowstorm.
- Preparedness, including planning, training, and exercise, for a widespread power outage and/or infrastructure damage event is inadequate across all sectors.
- CL&P did not lean forward by pre-staging adequate restoration resources in advance of the October 29 snowstorm; this delayed the recovery effort in the first days.
- As is the case with most electric utilities, CL&P is dependent on contractors and mutual aid from other utilities to address a large-scale outage. Several factors contributed to initial delays in auxiliary staffing for this event. The company was able to almost fully restore power by Wednesday, November 9, by bringing in thousands of crews later in the event.
- CL&P developed an internal stretch goal to restore power to 99 percent of all customers by Sunday, November 6. Without vetting internally, the company announced this date as a public performance commitment. This announcement, and a subsequent commitment to restore 99 percent of all customers in each of 149 municipalities by November 6, unnecessarily contributed to increased customer frustration and challenges for municipal governments.
- Northeast Utilities (NU), CL&P's parent company, did not provide sufficient executive leadership during this restoration effort, allowing one individual to oversee the restoration effort, serve as the primary liaison at the state Emergency Operations Center, and be the public spokesperson.
- When power was restored for individual customers, CL&P's real-time situational awareness and ability to communicate restoration status to customers, was delayed by as much as 12 hours as data was not updated in the system until crews returned from their shifts. This hampered coordinated decision-making and accurate communication regarding power restoration activities.
- Although a good idea in concept, CL&P's Town Liaison program had not been fully developed at the time of the snowstorm and was not consistently effective in providing

[1] CL&P Internal Communications Report, November 9, 2011

a conduit for accurate information between the company and municipal governments, and, in some cases, undermined the company's credibility with local officials.
- CL&P crews and public sector response and emergency management entities in Connecticut generally use radio systems for response communication in the field that are not compatible with each other.
- While vital to provide needed capabilities, use of external mutual assistance and contract crews presents communication, reporting, and tracking challenges because they often do not have the same communications or field reporting technology as used by local crews.

Overview of Recommendations

The 27 recommendations found in this report can be categorized in several broad themes:

- CL&P should improve its planning, procedures, training, and pre-staging practices to adequately prepare its crews and resources for the scale of incidents it and its customers potentially face by significantly increasing the scale of planning scenarios.
- CL&P needs to develop its management scalability for large-scale incidents by implementing an Incident Command System (ICS) structure that expands with the requirements of the incident.
- CL&P needs to improve its processes for information management, including message vetting, communication, and coordination with local governments, and the dissemination of public information to its customers, external partners, stakeholders, and the media. During a large-scale outage, it can be as important to communicate the restoration plan and progress toward implementation of that plan, as it is to restore power itself.
- CL&P should more closely coordinate and integrate preparedness activities with state and local governments to include ongoing planning, training, and exercise for utility disruption.
- State and local government planning and preparedness should address major power disruption more comprehensively and inclusively, including coordination with utility providers and procedures for damage assessment teams in power and/or utility outage events.

As noted above, the scope of this expedited high-level review is limited to the restoration effort itself. There are several other factors that impact the scale of outages during a major event including system design, hardening, vegetation management, and regulatory issues. We recommend further review of these and other issues.

This review was conducted under extraordinary circumstances; the restoration effort was still ongoing when interviews were conducted. We want to thank the state, local, utility, and labor officials who cooperated in this review. Finally, we want to thank the thousands of workers who cleared the roads and restored the power for individual citizens, their schools, businesses, and

communities. This review appropriately focuses on opportunities for improvement, but we should not overlook the millions of actions that were performed well.

II. Scope and Methodology

A. Scope

The State of Connecticut retained Witt Associates to provide an independent assessment of preparedness, response, and restoration efforts associated with the snowstorm that occurred October 29-30, 2011.

The focus of this assessment is the performance of private utility providers and local and state public sector entities responsible for (1) restoration of electric power transmission and distribution, and (2) emergency preparedness and response related to widespread power outages. This assessment presents an objective and informative identification of problem areas along with recommendations for improvement.

B. Methodology

This assessment is an expedited, high-level report that addresses issues associated with the restoration of power after the October 29, 2011, snowstorm. The assessment included a series of activities in a compressed time frame (November 7 to December 1):

- project initiation and objective setting
- data collection, including document review and analysis
- interviews with local elected officials, as well as public safety, emergency management, public works, and transportation officials and interviews with state agency personnel
- interviews with utility officials
- interviews with labor officials
- assessment report development

In setting the aggressive timeline for the report, Governor Dannel P. Malloy noted the need for expedited review. The report was developed using qualitative and expert analysis of input from individuals in responsible positions in the private and public sectors, as well as document review.

The consultant team reviewed documents relevant to the incident, including but not limited to:

- utility and government emergency response plans
- evaluations of recent power outage events including the March 2010 severe weather and Hurricane Irene (August 2011)
- snowstorm event summaries and response timelines
- weather forecasts
- CL&P and UI presentations to the State Team Organized for the Review of Management of Irene (STORM) Panel and Two STORM Panel
- coverage and outage maps

- utility company mutual aid agreements;
- staffing data and related information providing by CL&P
- press releases
- other documents

(A list of documents reviewed is provided in Appendix B.)

Witt Associates conducted a series of interviews, asking standardized questions to focus the interviews on factors related to power restoration and emergency response, and to provide consistency across interviewers and participants. In addition to directed questions, interviewees also were asked open-ended questions to allow for discussion of the issues and recommendations most relevant or important to their jurisdiction or organization. The team conducted more than 65 interviews with local and state government representatives and executives, operational staff, communications staff, and other personnel from CL&P and UI. A list of interview participants is found in Appendix A.

To analyze the information available, the consultant team applied its expertise in the field of emergency preparedness, response, recovery, and mitigation as well as electric utility operations and restoration. The team also referenced findings and recommendations from previous incident assessment reports. Findings and recommendations contained in this report have been vetted and validated by members of the consultant team, including utility subject-matter experts.

When asked to conduct reviews such as this, Witt Associates finds it effective and helpful for the client to focus on areas that offer the greatest potential for improving future performance. This methodology can have the effect of emphasizing challenges and other negative issues. However, Witt Associates also recognizes strengths and successes in the response and has sought to note effective action where appropriate.

C. Acknowledgements

Witt Associates acknowledges the assistance of local and state officials, CL&P and UI officials, labor and others in providing access and information in a timely manner. The consultant team appreciates the time and valuable input of the individuals interviewed for the assessment, who were forthcoming and thoughtful in the information and opinions they provided, despite in most cases having just experienced a long and difficult snowstorm response and power restoration. Witt Associates would like to emphasize the extraordinary actions and efforts of those involved in the power restoration effort in both the public and private sectors, including line crews, public works personnel, and utility company and government emergency management staff. They worked diligently, many in hazardous or challenging conditions, to return Connecticut's communities back to normal operations in what was the largest power outage event in the state's history. Many individuals performed as best they could in adverse circumstances.

III. Summary of Events

The northeastern United States, including the State of Connecticut, experienced an early season snowstorm on October 29-30, 2011, that resulted in more than 809,097 individual CL&P customers[2] without power at some time (807,228 at the peak of the outage), a portion of whom remained without power for a week to 11 days. Peak outages in UI's service area were approximately 19,000, and total outages 52,000[3]. While the region is accustomed to significant winter snowfall , the snowstorm dumped 12 inches or more of wet, heavy snow on parts of Connecticut and its neighboring states at a time when foliage remained on many trees. As a result, the snowstorm caused major damage to trees and power lines, blocking roads and creating widespread power outages. Eight snowstorm-related fatalities were reported. The snowstorm and power outage resulted in significant economic impacts in the state, including response and debris removal costs and lost business days.

Predictions for Early Snow

Weather forecasts for Connecticut at midweek before the storm warned of the potential for heavy, wet snow. By Friday morning, October 28, weather subscription services were issuing winter weather alerts, with forecasts predicting up to eight inches of snow beginning on Saturday afternoon, October 29. The Connecticut Department of Emergency Services and Public Protection sent notices of weather forecasts to local governments and others (see Appendix C), and its Department of Emergency Management and Homeland Security (DEMHS) communicated with local governments and utilities including electric power and some telecommunications providers. On Friday DEMHS began holding Unified Command conference calls or meetings, which included utility representatives, as well as conference calls with municipalities. Some local governments began preparing public works and snow removal crews for the weekend's work.

The two private electricity providers[4] in the state, CL&P, a subsidiary of Northeast Utilities, and UI, began placing crews on standby Friday morning, October 28. In addition, CL&P pre-positioned 30 contractors who had been working on transmission lines for anticipated distribution line damage. According to CL&P, this was the first time in its history crews had been pre-positioned. CL&P

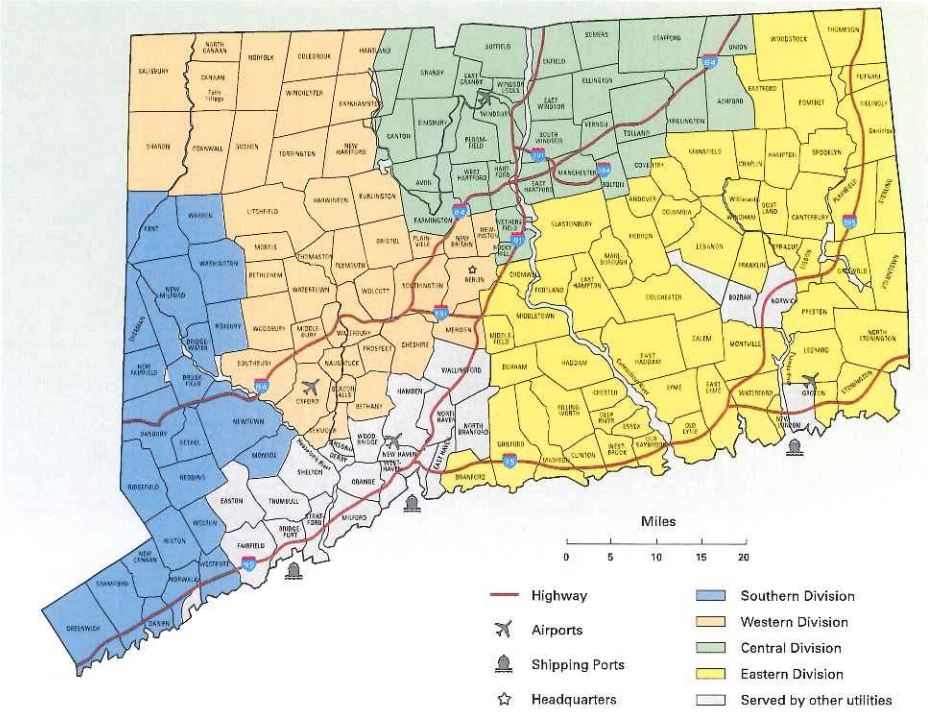
[2] A customer is defined based on meters and billing; it can be a residence housing one individual or a family, an apartment complex housing several families, or an individual business or multiple facilities under one account. In general, the number of individual persons affected by a large-scale power outage exceeds the number of utilty customers.

[3] For comparison, in a total service area of approximately 350,000, during Irene UI had a peak of 158,000 customers out, and a total of 201,000.

[4] Two towns are served by Norwich's municipal utility.

provides electricity to approximately 1.2 million customers, with UI serving approximately 350,000 customers, primarily in south-central and southwestern coastal areas of Connecticut.

Figure 1. CL&P Coverage Area



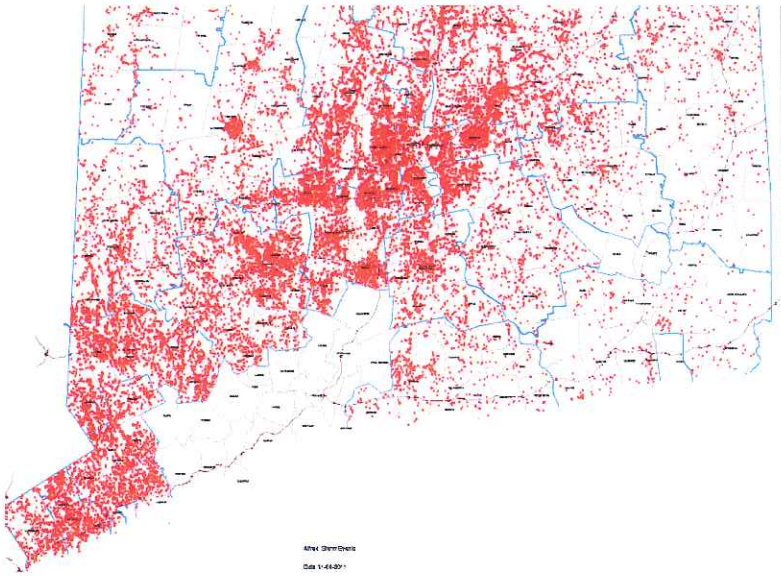
Cracking Branches, Widespread Power Outage

Although snow had not been forecast to begin falling until the afternoon of Saturday, October 29, it began before noon on Saturday, becoming heavy by midday, and continuing through Sunday. By the overnight hours on Saturday, the heavy snow began taking its toll on trees, with limbs sagging and breaking – issuing loud cracks heard in many neighborhoods – and taking out power lines and poles as they fell. A state that only two months prior had experienced record power outages because of Hurricane Irene (August 28, 2011) was about to experience another major power emergency, and this one would prove to be far worse.

Much of the state was impacted by the power outage; hardest hit areas included the north central part of the state, including the Farmington Valley. CL&P reports indicated a total of approximately 25,000 "trouble spots"[5]. This is the highest number in CL&P's history. (See Figure 1.)

[5] A trouble spot is a location where there is damage to electrical transmission / distribution system components requiring crew response to make conditions safe for the public, repair damage, and restore power.

Figure 2. Trouble Spots from October Snowstorm



CL&P Trouble Spots From October Snowstorm

- ~25,500 trouble spots (almost 60% more than Irene); repaired over 11 days
- CL&P estimated 205,000 crew hours of restoration work during incident
- Most significant damage experienced in north-central portion of state

Source: CL&PReport to Two STORM Panel

In heavily impacted locations, the severity and breadth of damage from the snowstorm created challenges for municipalities' tree- and road-clearing crews and CL&P's restoration operations. There were thousands of locations of downed trees and power lines, and in many cases, this resulted in challenges related to making sure that downed lines were not live – "cut, clear and make safe" in power company terminology – before local public works crews could remove trees and clear roads.

Interviews with CL&P personnel indicated the company devoted its resources heavily to cut, clear, and make-safe operations for the first three days following the storm, and it attempted to deploy at least one crew to each town in its service area to support this. As a result, a full focus on actual power restoration did not begin until Wednesday, November 2, according to an interview with CL&P systems operations management. In addition, getting from place to place was difficult because of the number of roads blocked by downed trees and, often, power lines. Areas served by UI were less severely impacted. A total of 52,000 UI customers lost power (with a peak of 19,000 outages at one time). All UI service was restored by the close of Wednesday, November 2.

Projecting and Communicating Restoration Times

Early in the outage, CL&P officials, using outage reports and computer models designed for planning power-restoration activities, projected Wednesday, November 9, as the date for full restoration to all customers. However, as customers complained about the length of time without electricity, CL&P set an aggressive internal goal – based on the restoration curve projected by its restoration model – to restore 99 percent of its customers who were without power by midnight Sunday, November 6. Although not vetted internally, this internal target was communicated to the public through statements to the media on November 1.

On November 4, CL&P's president and chief operating officer reiterated the target but stated more specifically that all of the municipalities served by CL&P would be 99 percent restored by midnight Sunday. This is numerically different and was a more difficult goal than the general 99 percent target. Some CL&P liaisons assigned to the most affected towns were skeptical that each town could be restored to 99 percent by Sunday, although they typically maintained unity of message in their communications.

When this projection, which had been viewed as a promise by both customers and towns, was not met, customers and local officials in towns still below 99 percent were frustrated. Through these statements, CL&P created unnecessary expectations on the part of customers and their elected officials, resulting in cynicism regarding power company operations and statements and adding to anger about the duration of the outage.

A recently implemented Town Liaison program, through which CL&P placed liaisons with each municipality during the outage, had mixed results. In some towns, liaisons communicated reliable information between CL&P operations and the towns. In others, however, the presence of liaisons raised municipal officials' expectations of communication and coordination, and the assigned liaisons were not sufficiently integrated with restoration operations to meet these expectations.

Frustration

Local government officials and residents in towns that still had power outages were frustrated by the uncertainty regarding the time by which power would be restored, which challenged planning for shelter operations, continuity operations, and emergency and human services. Some town officials were told they would get power crews in their area on specific days and the crews did not appear. Municipal emergency officials communicated damage assessments and top priorities for restoration through their CL&P town liaison; however, many reported delays in addressing their priorities, and they described a failure on CL&P's part to explain these delays.

CL&P's Restoration Effort

A new CL&P Emergency Plan (June 2011) was in place, but many corrective actions identified in the intervening Hurricane Irene outage had not yet been implemented. Because of the recency of the plan update, the company had not had time to engage in significant training or exercise of the new version of the plan.

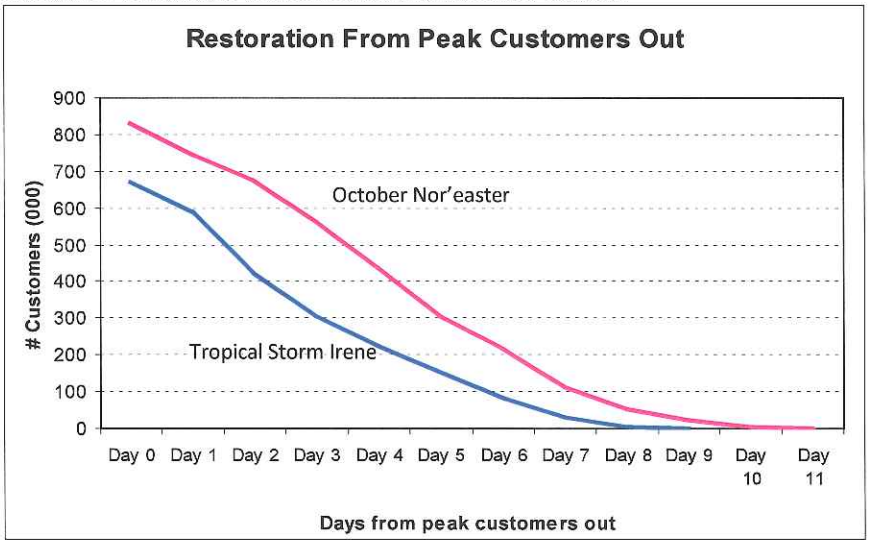
CL&P, which served most of the outage area, brought in contract and mutual aid crews from other states and Canadian provinces. Both CL&P and UI are members of the Northeast Mutual Assistance Group (NEMAG), a collection of northeastern electricity providers that have an agreement under which they can send resources to assist in another state in power emergencies. CL&P also is a member of the New York Mutual Assistance Group (NYMAG). CL&P called up some contract crews on Friday, October 29, and requested mutual assistance crews on Saturday, about the same time as

other companies in the region also identified the need for mutual assistance. Prior to the snow starting, states in the region were not releasing crews.

CL&P reported delays in some mutual assistance reaching the state, which was likely complicated by the regional nature of the incident and competition for resources (multiple nearby states were also affected). CL&P reported the number of tree, line, and service crews that worked in the restoration effort totaled 2,917 (internal and external)[6].

Restoration involved addressing transmission backbone and infrastructure damage as well as distribution lines. It is unusual to lose transmission lines as trees are cleared to provide much wider right-of-ways; but in several cases, the weight of the snow brought down full trees onto transmission lines. In some areas, portions of the system had to be rebuilt.

Figure 3. Restoration Curve
Source: CL&P Presentation to Two STORM Panel, November 15, 2011



Gradually, power was restored to the 149 municipalities without power; the 99 percent overall restoration benchmark was reached shortly after the original projection date of Sunday, November 6 (though not for every town). The last CL&P customers to be brought back online were restored on November 9, as the company's model had initially predicted. Restoration of more than 809,000 outages in 11 days in not inconsistent with industry benchmarks. However, there are factors that could have reduced the time required for restoration.

While the power outage was widespread and challenging, it is noted that there were no fatalities or major injuries reported at the time of this report associated with either CL&P or UI's restoration efforts.

[6] CL&P Presentation to Two STORM Panel, November 15, 2011.

Evaluating the Response

Governor Dannel P. Malloy requested an emergency declaration for affected areas of the state, which President Barack Obama approved on October 31, 2011. On November 11, 2011, after a preliminary damage assessment that estimated eligible costs at $27 million, Governor Malloy requested a major disaster declaration, which was granted on November 17. The declaration will make assistance available to local governments for debris removal, infrastructure repair, and mitigation projects.

Governor Malloy added review of the snowstorm outage to the responsibilities of the STORM Panel he established after Hurricane Irene. Many municipal and state government agencies and the utility companies noted that they will review their response capabilities and adjust plans and resource planning in light of the incident.

Additionally, on November 4, Governor Malloy retained the services of Witt Associates to perform an independent assessment of utility companies' response to the snow event. The Connecticut Public Utilities Regulating Authority (PURA) also initiated an investigation of restoration performance in response to both Irene and the snowstorm. The Attorney General's Office called for the investigation to be broadened to include telecommunications and cable services as well. On November 17, CL&P announced several personnel changes, including the resignation of its president and chief operating officer, and the establishment of a position of senior vice president of emergency preparedness.

IV. Findings and Recommendations

The primary objective of this review is to identify what went well and where improvement is warranted. Where appropriate, we offer recommendations to enhance Connecticut's resiliency for the next significant outage event.

The findings and recommendations listed in this section were developed based on analysis of interviews conducted with more than 65 key personnel (see Appendix A) and through document review (see Appendix B). Members of the consultant team attended the November 9 Two STORM Panel meeting and reviewed summaries from other meetings of the panel. Findings and recommendations are organized by issue area, generally progressing from preparedness through response (including coordination and communication). A section noting issues outside the scope of this report is found in section IV.H.

Each issue section describes background regarding the issue, a simple statement of findings, and one or more recommendation regarding that finding. Recommendations are numbered for ease of reference for corrective action planning and monitoring.

A. Preparedness Across All Sectors

Issue: Preparedness – including planning, training, and exercise – for a widespread power outage and/or infrastructure damage event is inadequate across all sectors.

Background: CL&P underestimated in its planning the potential scale of a worst-case power outage event. This underestimate had ripple effects through CL&P's planning for personnel, equipment, and coordination needs. CL&P's 2011 Emergency Response Plan uses a series of five levels, with Level V (the most severe) classified as an extreme event with major system impact at 100,000 or more customers, which is less than 10 percent of CL&P's total

Figure 4. CL&P Event Classifications from CL&P Emergency Response Plan

Level	Characteristics	Outages	Expected Duration	Frequency
I	Small Impact Event	<10,000	<12 hours	<75/year
II	Moderate	<20,000	12-24 hours	<25/year
III	Serious	<40,000	24-48 hours	<10/year
IV	Major	<80,000	48-72 hours	<5/year
V	Extreme	>100,000	>72 hours	Once in 5 years

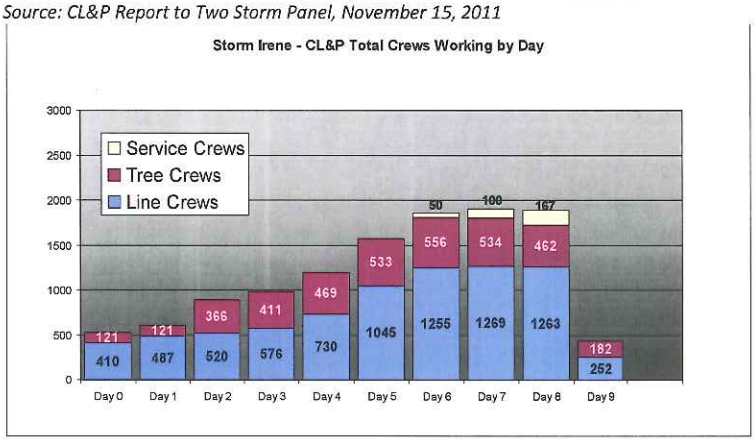
October 2011 snowstorm event >900,000 outages

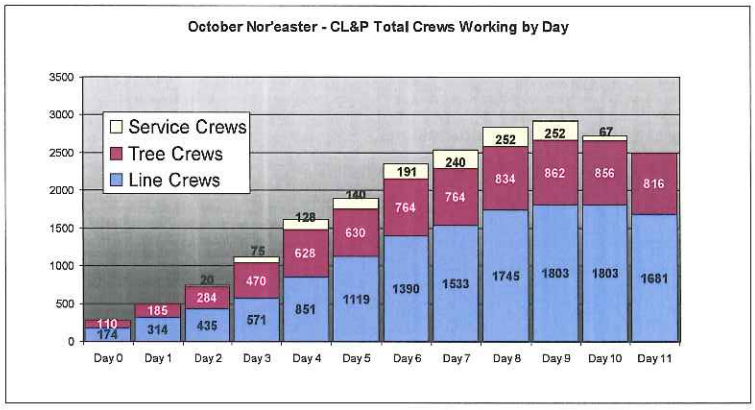
customers, without power and 1800-plus trouble spots. The October 2011 snowstorm exceeded this criteria, resulting in 807,228 users without power at the peak of the outage and more than 25,000 trouble spots. The plan's classification of service outage events matrix seriously underestimates the potential power outage events that could occur, and for which the company should plan.

Both UI and CL&P are members of the Northwest Mutual Assistance Group (NEMAG), and CL&P is also a member of the New York Mutual Assistance Group (NYMAG), which include electricity providers in nearby states that agree to send crews to support each other's restoration efforts, if crews are available, in an emergency. Mutual assistance crews from other states are vital in providing operational capacity for a large-scale restoration effort (see section IV.G below for additional discussion of mutual assistance). The increased capacity is important but requires increased management capability to coordinate efficiently.

After-action reports from several recent large-scale outage events in Connecticut, including the March 2010 severe weather and Hurricane Irene, identified the need for CL&P to increase its management staffing in a large-scale incident to coordinate and manage efforts of the significantly increased workforce. With 10 times more resources to manage than during normal operations, the company had to coordinate staffing and operational levels it had not had the opportunity to exercise.

Figure 5. CL&P Crew Numbers by Day, Irene and October Snowstorm
Source: CL&P Report to Two Storm Panel, November 15, 2011





After the snowstorm, CL&P reported challenges in managing local government expectations related to the role of power company crews in assisting with cut and clear operations. Local jurisdictions that fared better and reported more success in power restoration efforts (at least from the sample interviewed for this report) generally reported that they went into the storm weekend with an aggressive preparedness stance and pre-identified capabilities for damage assessment, tree and road clearing, and debris removal activities.

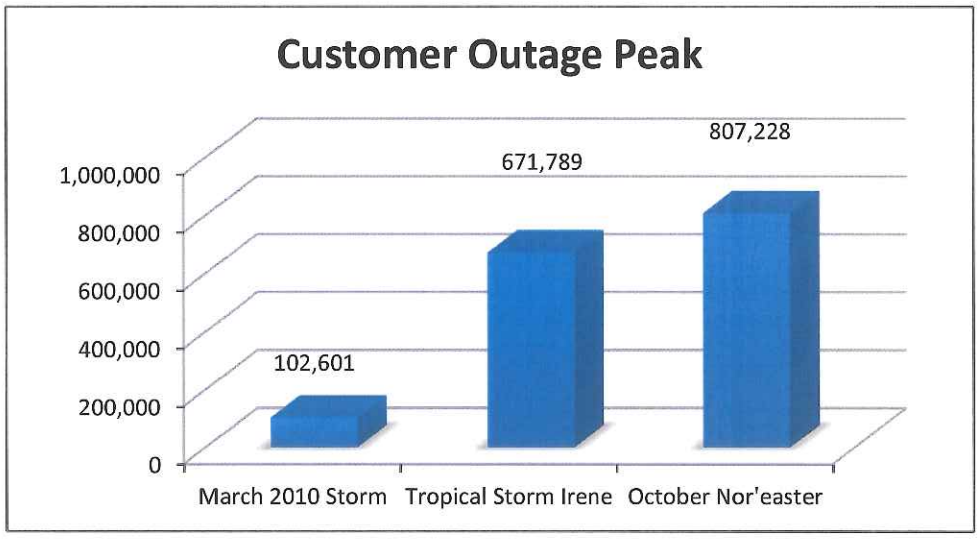
The Connecticut State Response Framework and its Natural Disaster Plan do not specifically address responsibilities or refer to procedures for a power outage incident. The state plans refer to

Emergency Support Functions, or ESFs, as used in the National Response Framework and federal emergency planning guidance, but the plans do not organize agency activities by ESFs or functional area (such as energy). The state Natural Disaster Plan provides that the Department of Public Utility Control has responsibility for ensuring that utilities have the resources to mobilize maintenance and repair forces.[7] The State Response Framework tasks DPUC similarly and adds keeping the State Emergency Operations Center (SEOC) updated on power disruption and restoration status. The state is developing an Energy Assurance Plan , which is in draft and is scheduled to be completed in 2012. This initiative is led by the Connecticut Office of Policy and Management.

The State DEMHS planning template that guides many municipal emergency response plans likewise does not address major power disruption in detail. The template assigns responsibility for coordination with utilities to the local public works department. It also notes responsibility of utility companies to provide a liaison to local governments, work with the municipal chief executive regarding restoration priorities, and communicate with the municipal executive regarding damage assessments and restoration progress. Utilities and local and state levels of government participate in exercises periodically to test plans, procedures, and equipment and provide practice to personnel with responsibilities in emergency incidents.

Finding: CL&P's classification of service outage events provides an inadequate planning scenario to prepare the company for the capability needs, resource coordination, and communication challenges implied by an outage on the scale of the October snowstorm. The plan's maximum Level V (100,000-plus, or 8 percent of all CL&P customers) does not represent viable worst-case outage scenario for a company with 1.2 million customers. (In contrast, the most severe event level described in UI's emergency plan is 250,000-plus, or 71 percent of all customers.)

Figure 6. CL&P Customer Outage Peak, Recent Events



[7] Connecticut Natural Disaster Plan, 2009, p. C-15.

A.1 **Recommendation:** CL&P should review and revise the classification of service outage events planning matrix in its Emergency Response Plan to realistically address small, medium, and large-scale power outage events that could impact the state. Based on the precedents of Hurricane Irene and the October 2011 snowstorm, top level(s) should address outages involving well more than half of all CL&P customers.

Finding: While measures to increase management in CL&P had been identified and some implemented, the magnitude and severity of the October 2011 outage challenged CL&P's ability to coordinate and communicate accurate and timely restoration actions. While CL&P brings in additional management staff from across NU on an ad hoc basis during large-scale incidents, the scale of the October snowstorm and the volume of assets required to restore power severely taxed the situational awareness, coordination, and communication capabilities of CL&P's response organization.

A.2 **Recommendation:** CL&P should improve procedures and capabilities to scale up management and coordination capabilities to deal with field staffing levels at seven to 10 times the company's normal field staffing.

Finding: CL&P operated under the new revision of its Emergency Response Plan, dated June 2011. The plan uses terminology consistent with the federal National Incident Management System (NIMS), including use of ICS, which is a scalable management structure used in emergency incidents in the United States. ICS is flexible and is utilized for incidents of any type, scope, and complexity. ICS allows its users to adopt an integrated organizational structure that matches the complexities and demands of single or multiple incidents. ICS, when utilized by government, nongovernmental organizations and the private sector, provides a uniform approach with seamless communication between dissimilar organizations. However, the plan does not appear to create a scalable management structure in that it replaces one level of organization with another (district to division to area to system)[8] rather than creating a structure that can expand horizontally with the incident size and maintain a manageable span of control and unity of command at each level of the organizational structure. Such flexibility is a key principle of ICS. Specifically, the plan's mobilization scheme does not provide for transition of authority as an event escalates and is not expandable or easily contractible (four distinct organizations remain mobilized simultaneously). As an event escalates, each subsequent mobilization is layered upon the previous with no clear chain of command among the layers. Key positions are duplicated at each layer (not expanded) during a combined response, which can create confusion as to roles and responsibilities.

A.3 **Recommendation:** CL&P should review and revise its plans and procedures' ability to support scalable incident management during an event and should exercise management scalability as part of its preparedness program. CL&P should implement an ICS training protocol for command staff and general staff and incorporate ICS principles and implementation into drills and participate in multi-agency and multi-jurisdictional exercises utilizing ICS. The company also should inventory and categorize resources by capability to

[8] See CL&P Emergency Response Plan, Section 4, Emergency Response Organizations

provide for improved identification, request, deployment, and tracking of internal and external resources. The company can explore use of ICS forms or comparable forms to promote consistency in management and documentation of incidents.

Finding: NU officials did not provide sufficient organizational/leadership support during this restoration event, allowing a single individual to manage the restoration event, serve as the lead liaison to the State Emergency Operations Center and the Governor, and serve as the public spokesperson. This combination of expectations can create difficulty accomplishing the requirements of each and is not good practice for an organization with resources to spread responsibilities to trained management-level staff. A key tenet of ICS is scalability of incident management; command responsibilities in a major incident include delegating key roles such as public information and government liaison to other qualified individuals.

A.4 Recommendation: CL&P should review and adjust plans, procedures, and training as needed to ensure that corporate-level command, public information, and liaison roles are not placed on one person in a large-scale restoration effort.

Finding: CL&P has designated personnel responsible for operations and emergency preparedness and response. The CL&P Emergency Response Plan, Section 4, Emergency Management Organizations, references the NU Emergency Operations Group (NU EOG) and CL&P Emergency Management Group (CL&P EMG); the CL&P EMG includes staff of the CL&P Emergency Management Department, and the NU group is composed of two people. It is not clear if and how these groups review preparedness on an ongoing basis and act to provide high-level problem-solving during an incident.

A.5 Recommendation: CL&P and its parent company, NU, should establish robust, integrated emergency management leadership capabilities at the executive level. An emergency preparedness and response steering committee or similar body composed of representatives of various components of CL&P and NU should meet regularly to review CL&P's emergency preparedness program and related activities, provide input, and facilitate involvement throughout the organization. Procedures should be developed to define the group's role during an event as that of a crisis management team that will provide CL&P operations a big-picture view and assist with problem-solving, including identifying issues that may harm the organization, its stakeholders, or the general public, and setting overarching incident objectives.

Finding: Utilities and local and state governments conduct drills and exercises periodically to practice and test their emergency plans, procedures, and response capabilities, but there is need for joint multi-jurisdictional exercises that address municipal, state, and utility procedures and capabilities for a widespread power outage. Neither CL&P nor UI involve municipal partners in their exercises (although UI has participated in municipal exercises). The CL&P Emergency Response Plan calls for annual storm drills prior to August. While some drills have been held, CL&P did not provide documentation of exercise after-action reports identifying who participated as well as corrective actions and follow-up. After-action reports are standard practice for utilities for both actual events and exercises.

A.6 **Recommendation:** CL&P should create and maintain a robust training, exercise, and corrective action program so that items for improvement are identified in real-world and exercise events, assigned as responsibilities, and monitored for resolution or further action.

A.7 **Recommendation:** Electric utilities and the public sector should work together to establish policies and exercise practices regarding damage assessment, cut-clear, make-safe, and debris removal. State DEMHS regions, Local Emergency Planning Committees (LEPCs), or another regional approach, could be an effective way to approach multi-sector exercises. A regional approach could more easily coordinate with CL&P area organization, which is based on circuits and area work centers (AWCs) rather than municipalities.

Finding: CL&P offers training regarding power-line safety, and some (but not all) municipalities reported that local personnel have participated in this. While CL&P District Command is to meet annually with public officials to discuss emergency plans,[9] CL&P has no formal training or education for municipal officials. Municipal officials and crews would benefit from training regarding the basics of the power infrastructure that serves their area.

A.8 **Recommendation:** Electric utilities should regularly train municipal public works personnel, damage assessment teams, and local fire and public safety personnel on utility line identification, live wire identification, and electricity infrastructure and system basics for their areas. Utilities also should provide training and education for municipal leaders on the basic architecture of the power grid and system serving their areas.

Finding: Some local governments have well-defined structures and procedures for incident response and management. Others, for varied reasons including staffing levels, resources, and personnel expertise, have minimal processes established for coordinating complex operations, such as designation of a clear point of contact for coordination with utility representatives in a major outage and procedures for damage assessment.

A.9 **Recommendation:** Municipalities should address major power disruption in emergency plans and procedures, including designation of a point of contact to provide clear lines of communication and coordination with utility providers and procedures for damage assessment teams in power and/or utility outage events. CL&P should maintain a list of all 149 municipal points of contact and validate this list on an annual basis (this is standard procedure at UI).

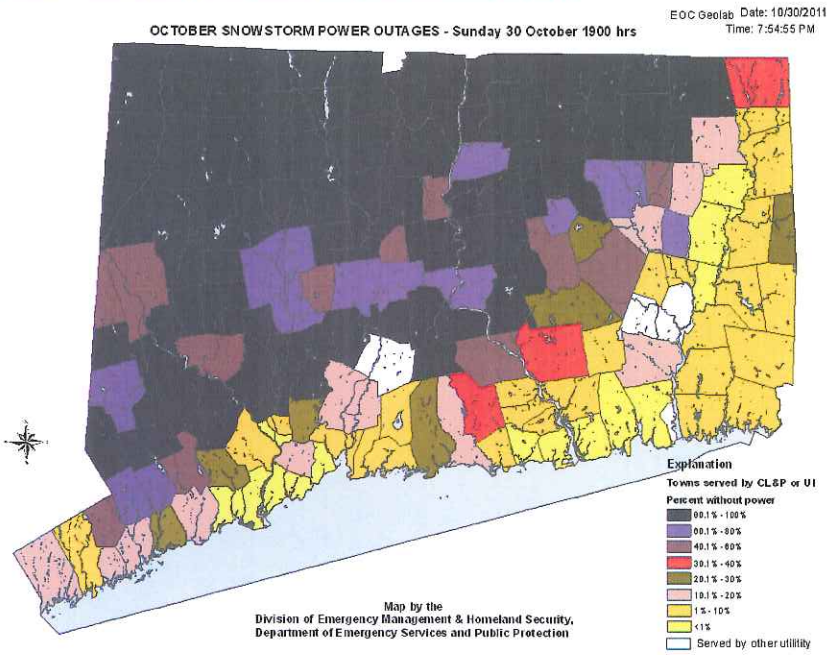
Finding: CL&P plans anticipate that the company will receive from municipalities annually a list of critical infrastructure priorities for their jurisdictions. Some municipalities reported meeting regularly, if not always annually, with CL&P representatives and providing them their overall restoration priorities. However, some municipalities do not regularly provide a pre-event restoration priority list. CL&P received detailed damage assessment data from many towns during the 2011 snowstorm but lacked a process to assimilate it into the company's overall damage assessments.

[9] CL&P Emergency Response Plan (June 2011), Basic Plan, Section 4, Preparedness Activities.

A.10 **Recommendation:** CL&P and municipal governments should establish a regular schedule and process for municipalities to provide and update their pre-identified restoration priority lists. CL&P should update and validate municipal priorities on a regular basis (which is standard procedure at UI). CL&P should also be prepared to explain to municipalities why their priorities may not be addressed exactly as submitted because of the geography of power circuits and utility grid architecture.

A.11 **Recommendation:** CL&P should establish a methodology and tools by which municipalities conduct damage assessments and provide the results to CL&P in a way that CL&P can easily assimilate into its damage assessment process. CL&P should train municipal staff on their damage assessment terminology and information needs and use of CL&P's methodology and tools. This would expand CL&P's damage assessment capabilities, enhance the company's situational awareness, result in a more efficient restoration process, and increase coordination and trust with municipalities.

Figure 7. Power Outage Map from State EOC, October 30, 2011



Finding: Public sector emergency response planning at the state and local levels does not adequately focus on actions needed in a significant power outage and assignment of responsibilities in mitigation, preparedness, response, and recovery in utility disruption events. State and local plans call for reports from power companies but do address multi-agency actions or coordination needed to address energy disruption. State and local plans do not utilize an energy functional area or ESF 12, Energy, to bring organizations together to work on planning, preparedness, capability and resource analysis, and response coordination issues.

A.12 **Recommendation:** Connecticut DEMHS should review and improve state planning for power outage events and play a stronger role in guiding and reviewing municipal plans and procedures for response to power outages, including responsibilities, capability needs, coordination, situational awareness, damage assessment, and debris clearing and removal. The state should incorporate an ESF 12, Energy, into its emergency plan to provide a structure for ongoing multi-agency communication, coordination, and preparedness for

power disruption events. The template provided by DEMHS to municipal offices of emergency management for development of their emergency operations plans also should include an ESF 12 or comparable component to prepare coordinated multi-agency power outage response capabilities.[10]

B. Readying for Impact

Issue: CL&P did not pre-stage adequate restoration resources in advance of the October 28 snowstorm.

Background: Weather forecasts early in the week of October 24 suggested the potential for an early snow event in the northeastern United States. By Friday morning, forecasters predicted four to eight inches of heavy, wet snow in the northern sections of Connecticut, more in higher elevations, and fewer inches elsewhere in the state. The state DEMHS began tracking weather forecasts and relaying messages to private sector partners and municipalities to prepare for effects of heavy, wet snow on trees with still-significant leaf cover. On Friday, October 28, DEMHS began holding Unified Command calls or meetings, in which CL&P representatives participate, and conference calls with municipalities.

Severe Weather Alert Service From NU's Weather Subscription Service, 6 a.m. forecast, Fri., October 28. 2-3 day outlook:
"...For CT, northwestern/northern CT could approach the 4-8 inch range as well, with a swath of 2-4 inches over the central/eastern portions of the state, while locations right along the coast should hover in the 1-2 inch range. The highest accumulations will be over grassy areas, trees, and any colder/exposed surfaces. The snow will be wet and heavy for all areas, and is likely to cause problems with tree limbs and power lines. Wind gusts for interior locations with this storm may gust 25-35 mph, while gusts over southeastern CT, as well as eastern NH towards the coast, may range between 30-40 mph."

CL&P, too, was monitoring weather forecasts. While the Friday morning forecast warned of the potential impacts of four to eight inches of heavy, wet snow in combination with remaining foliage, CL&P did not pre-stage company crews before the snow began. It housed some contract crews in the area and placed available line crews on call - 134 for Saturday and 146 for Sunday. CL&P's Emergency Response Plan calls for pre-positioning of CL&P personnel in Level V power emergencies – those with potential for more than 100,000 customer outages. The company contends that it prepared for the size of the storm forecasted, noting that the actual snowstorm exceeded the four to eight inches forecast; however, tree limbs can be expected to fall even with four to eight inches.

Electric distribution companies rely on mutual aid and outside assistance for additional staffing and equipment to restore power following a major storm. In a large-scale outage, CL&P first calls on its own contractors, then seeks help through NU from sister companies, then or simultaneously

[10] See Comprehensive Preparedness Guide (CPG) 101, v. 2.0, November 2010; Federal Emergency Management Agency.

requests mutual assistance, and then moves to employ unaffiliated contractors. Mutual assistance is based on agreements among power companies to send crews, upon request and if crews are available, to help another signatory of the agreement with restoration efforts. The company receiving assistance is later sent a bill by each company for the costs of the mutual assistance. Both UI and CL&P are members of the Northeast Mutual Assistance Group (NEMAG), and CL&P is also a member of New York Mutual Assistance Group (NYMAG); these include electricity providers in several northeastern states and Canadian provinces. Mutual assistance also is available from outside the region through a national Edison Electric Institute (EEI) agreement. While CL&P requested significant mutual assistance resources through appropriate channels, some mutual assistance was delayed or denied because of the regional nature of the incident, as utilities in neighboring states were addressing their own outages, and other issues.

On a NEMAG call on Friday morning, no utilities requested mutual aid. On a Saturday morning NEMAG call, although no utilities requested mutual aid there was general recognition that each company would be holding back their own resources in preparation for the approaching storm. By a Saturday afternoon NEMAG call, utilities in several states were requesting assistance and, as a result, found it difficult to secure mutual assistance crews. In its November 15, 2011, report to the Two STORM Panel, CL&P noted that there were 3,505 unmet mutual assistance requests among NEMAG states at the peak of the snowstorm.

CL&P reported that several states held crews rather than release them to go to Connecticut, which is likely at least partially related to the storm's regional potential. CL&P used mutual assistance in Hurricane Irene and had several invoices unpaid from contractors who sent crews because of accounting reviews of charges. The review conducted for this report did not find evidence that outstanding payments impeded the restoration process. CL&P officials said in interviews that the company plans to review its invoice dispute resolution process.

Finding: CL&P's decision not to pre-stage CL&P crews and assets before the day of the storm negatively impacted ability to quickly deploy sufficient personnel and equipment for cut-clear, make safe, and restoration activities.

B.1 Recommendation: CL&P's Emergency Response Plan and procedures should clarify when and what resources should be considered for pre-staging. For incidents for which there is notice, such as evolving weather forecasts, CL&P should develop a timeline to prompt decisions regarding key steps such as staging or deploying resources, with a time cushion to allow resources to be in place before the first impacts of the hazard are felt, including the capability to account for late changes in forecasts and events that may exceed forecast severity.

B.2 Recommendation: In its decision making timeline and ramp-up procedures, CL&P should address considerations to recognize the potential for significant regional impacts and, where indicated, provide triggers to quickly activate EEI mutual assistance requests for out-of-region support.

B.3 Recommendation: CL&P should develop and exercise pre-staging procedures and related logistics.

C. Public Communication

Issue: CL&P developed an internal stretch goal to restore power to 99 percent of all customers by Sunday, November 6. Without internal vetting, the company announced this date as a public performance commitment. This announcement, and the subsequent commitment to restore 99 percent of customers in each of the 149 municipalities it serves, unnecessarily contributed to increased customer frustration and challenges for municipal governments.

Background: Early in the outage, CL&P projected, using models it regularly employs to analyze outage and damage reports, it would have power restored by Wednesday, November 9. However, the company set an internal stretch goal to restore 99 percent of all outages by midnight Sunday, November 6. When this goal was released to the public in media events early in the week after the storm, it was perceived by the public and communities as a promise or deadline for restoration of 99 percent of customers by that date, and this perception was not corrected by the company.

The public statements about the internal goal were made after communication about the goal between CL&P president/chief operating officer, who also served as the company's public spokesperson during the incident, and the Governor.

In subsequent public communications, the 99 percent goal was translated as a projection that 99 percent of each municipality would be restored by the midnight, November 6, deadline. This was a more aggressive target.

The scale of the event created problems for power companies as well as for local public officials. Municipal emergency managers and officials in the hardest affected areas at first relied on the November 6 deadline and other CL&P statements about numbers of crews planned for specific areas on specific dates, as the towns worked to continue key municipal functions and provide public shelter, emergency access, and emergency assistance for their residents, especially the elderly and medically vulnerable. Unrealistic projections and inaccurate predictions of crews working in specific areas complicated municipalities' and residents' ability to plan for continuing to deal with the outage. As the outage continued, some municipalities began to ignore statements from CL&P because they experienced multiple instances of inaccurate statements or what were perceived as broken promises.

NU operates a centralized customer services operation. In large-scale outage events, customer service phone lines often are overwhelmed by those attempting to report and find out information regarding their outage. This was not the case for CL&P in this outage. As a result of investment in new systems, the average wait time for incoming calls during the event was 45 seconds. In addition, CL&P communicates with customers via social media and other options. Unfortunately,

communications, including responses to specific customer inquiries, repeated the 99 percent restoration message.

Finding: CL&P's public release of an internal goal of 99 percent restoration by midnight November 6, subsequent statements that the 99 percent goal would apply to each town, and its failure to correct these statements increased planning and coping challenges for municipal governments and customers and created anger among the public. The climate for public and municipal government frustration was likely enhanced by municipal elections scheduled for Tuesday, November 8.

C.1 Recommendation: CL&P should develop or review and implement policy for appropriate use and public release of internal restoration projections and targets. The policy should distinguish between internal operational targets and external communications and require that projections for public release be based on proven models and validated by operations components. Policies should apply to public communications staff as well as management and other personnel.

Finding: CL&P has significant public communications capabilities and staff. However, in the snowstorm outage, town liaison and corporate communications functions were not aligned in the organizational structure, and public messages and communications activities demonstrated a focus on unity or consistency of message rather than message accuracy.

C.2 Recommendation: CL&P should develop written procedures and protocols for verifying and vetting the accuracy and reality of projections and operational details before they are released to the public. This should incorporate policies and training to identify and correct rumors, misinformation, and/or its own misstatements to maintain credibility with customers, public sector partners, and the media.

C.3 Recommendation: CL&P corporate communications and emergency preparedness and response should designate qualified and trained individuals, who have an understanding of but do not have other immediate operational roles, to serve as public spokespersons for the company in power restoration and other emergency incidents.

C.4 Recommendation: CL&P should create written processes and procedures to ensure flow of information between town liaison and corporate communications functions, so that information can be both (a) strategically collected and vetted from accurate sources, and (b) distributed in a coordinated and effective manner.

D. Tracking Restoration Progress

Issue: CL&P real-time situation awareness of jobs-completed and crew location, progress, and needs was inadequate to properly support coordinated decision-making and accurate communication regarding power restoration activities.

Background: CL&P maintains its EOC to coordinate information and operations during an emergency or outage. Crews are given daily assignments each morning. Crews with CL&P technology in their vehicles log jobs completed in real time.

Most crews from outside the state, however, do not have compatible technology to report restoration status as soon as it is completed. In addition, although they have the technology, some internal crews prefer to focus on restoring power and delay status updates until the end of the shift. Because of the need to move on to the next trouble spot, crews working on paper reporting forms complete and submit those at the end of their shift, which can mean a delay of as long as 12 hours before restoration information is logged into the CL&P system. This delay can impact the company's overall understanding of the outage situation, which impacts decision-making regarding resource allocation and priorities. It also can impact the accuracy of information available to liaisons, municipalities and customers.

After-action recommendations from the March 2010 severe weather outbreak included that CL&P consider accelerating programs to provide mobile data terminals in distribution line trucks, or alternatively, providing additional Field Supervisor Lines and Supervisor of Distribution Lines with computers equipped with air cards to "streamline the process of closing work order tickets and enhance the ability of the dispatcher and analysts to effectively and efficiently plan and direct the remaining work efforts"[11]. These recommendations had not been acted on broadly by CL&P by the time of the October snowstorm. CL&P noted in a June 2011 compliance filing with the Department of Public Utility Control that the initiative was not currently funded or considered cost-effective.

CL&P offers a user-friendly outage map on its web site. Although the outage map is updated every 15 minutes, these updates are based on the manual entry methodology described above, and so are not necessarily updated in real time. This can lead to time delays in display of recent outages reported or recent restorations completed and, without explanation of this process accompanying the display, may be confusing to the public. Additionally, at one point during the October 2011 outage, the data breaks that determine what color shows for each percentage level of outage were changed on the CL&P web site, which may have been confusing to customers who had been monitoring the site on previous days.

Finding: In the snowstorm restoration effort, CL&P's information management processes did not support timely receipt, analysis, and use of vital information to provide situational awareness for operational decision-making and accurate internal communication with town liaisons and external communication to stakeholders.

> **D.1 Recommendation:** CL&P should implement systems and processes to improve real-time situational awareness of trouble spots addressed, crew locations, assignments completed, and related information to provide its EOC with timely information for

[11] Investigation of the Service Response and Communications of The Connecticut Light and Power Company Following the Outages of the Severe Weather over the Period of March 12 through March 14, 2010 (the Jacobs Report), October 26, 2010, p. 32.

coordinated decision-making and to improve the quality of information the company provides to town liaisons, municipalities, DEMHS, and the public.

D.2 Recommendation: Outage and restoration maps made available to the public should include explanation of any delays that impact the timeliness of information displayed on the maps and notation of any data analysis changes that impact the display.

E. Town Liaison Programe

Issue: CL&P's Town Liaison program had not been fully developed at the time of the snowstorm and was not consistently effective in providing a conduit for accurate information between the company and municipal governments.

Background: CL&P's Town Liaison program evolved in 2010 to address the need to improve communication and coordination between the company and local governments during significant power events. This need was identified in after-action reviews of response to the March 2010 severe weather event. The liaison program is included in the company's June 2011 update of its Emergency Response Plan and was used during Hurricane Irene.

Some liaison training had been accomplished by the time of the storm. CL&P deployed liaisons to 149 municipalities, although some communities initially shared liaisons. Because CL&P had not planned for this scale of outage, personnel tasked with serving as liaisons in some cases had minimal relevant experience and had not been fully trained on their roles, responsibilities, or reporting and communication protocols. Some liaisons did not have working knowledge of the power distribution system and the restoration process. In addition, a number of local officials reported that liaisons did not have prior experience or working relationships with the municipalities they were serving.

In the aftermath of the snowstorm, some hard-hit Connecticut towns experienced frustration with the apparent disconnect between information provided by their liaison and the company's actions. Municipal officials expected their respective Town Liaison to be able to provide accurate and timely information regarding restoration operations specific to their community. While local officials interviewed reported that individuals serving as liaisons did their best and worked hard to carry out their responsibilities, many also noted that the liaison did not seem to have access to the right information and in some cases did not have the necessary context and skills to interpret and communicate restoration operations details.

In some communities, CL&P staff reported that liaisons faced challenges in getting accurate and timely information from their counterparts in restoration operations. Additionally, the organizational structure deployed during the snowstorm response lacked a meaningful mechanism for two-way communication between the liaisons, upper management, and corporate communication.

A number of municipalities reported that their town liaisons were not able to communicate or work remotely with their CL&P counterparts, which, combined with damage review and other activities, meant they often had to be at CL&P or in the field at times when they would have been most valuable in municipalities' operations discussions (e.g., morning incident operations briefings).

Finding: CL&P deployed personnel to serve as town liaisons in some cases with little technical training, experience, or previous knowledge of the assigned municipalities to equip them in fulfilling their roles. While liaisons performed the best they could, municipalities identified the need for knowledge and skills that would assist them in understanding CL&P actions and communicating and coordinating with CL&P operations and management.

E.1 Recommendation: CL&P should, with input from municipalities, move forward in implementing a comprehensive training program for personnel who may be asked to serve as a Town Liaison. Town liaisons should have the ability to communicate clearly, understand circuit maps, terminology, and basic power restoration practices, and access power company dispatch systems.

Finding: CL&P town liaisons in many circumstances had not previously worked or exercised with the municipalities to which they were assigned and so were not familiar with local restoration priorities, personnel, capabilities, plans, procedures, or practices.

E.2 Recommendation: The Town Liaison cadre should participate in municipal and regional exercises that address power restoration as part of emergency response (see section IV.A above), both to review and practice restoration responsibilities and to develop understanding of municipalities' and CL&P's respective restoration priorities and operational capabilities and practices.

Finding: The company had not yet fully developed the liaison program in terms of incorporating liaison activities into CL&P restoration processes. While municipalities appreciated the concept of the Town Liaison program and praised the effort of the individuals serving as liaisons, they reported that in many cases, priorities shared with their liaison did not seem to affect CL&P activities, and information received from their liaison was inaccurate.

E.3 Recommendation: CL&P should review the Town Liaison program, identify the appropriate reporting structure for liaisons, and integrate liaisons into CL&P's procedures and practices for restoration decision-making and activities. To achieve their intended purpose, liaisons must be in a position to be trusted conduits of information from CL&P to the municipalities and from the municipalities to CL&P operations.

Finding: While possibly less of an issue in a small-scale outage, providing a Town Liaison to 149 municipalities taxed CL&P's Town Liaison program, resulting in deploying individuals with little or no preparation for the role. Efforts to share liaisons among municipalities were hampered by communication difficulties and liaisons' lack of capability to access and interpret vital CL&P information remotely.

E.4 Recommendation: CL&P should review its Town Liaison policies and staffing with municipalities to determine if there are workable ways to effectively share liaisons among municipalities (potentially organized by CL&P's circuits, state regions, or regional planning organizations). This would mean providing appropriate and redundant communications and coordination tools to liaisons so that they can effectively work with both assigned municipalities and the CL&P operations center remotely. This must take into consideration the strong potential for disruption of normal means of communication.

F. Communications Interoperability

Issue: CL&P crews and public sector response and emergency management entities in Connecticut generally use radio systems for response communication in the field that are not compatible with each other (UHF/VHF versus 800MHz).

Background: Public sector response agencies, including local and state government personnel, use two-way radio systems for communication in the field, which can create challenges in coordinating public and private sector crews working on interdependent activities associated with damage assessment, road clearing, and power restoration. In Connecticut, public-sector staff use 800 MHz radios, which provide flexibility and expandability and are considered the industry standard. CL&P crews also use two-way radios; however, they use UHF/VHF (low frequency) radios.

Although these two radio systems do not work with each other, technology bridges are commercially available to improve interoperability. Connecticut DEMHS stated that the agency had offered to provide state 800 MHz radios to key components of CL&P operations to improve field communications, but CL&P representatives did not accept the offer.

Finding: Electric utility company crews and public sector response and emergency management entities in Connecticut often use different radio systems (UHF/VHF versus 800MHz) for response communication. There is minimal capability or procedures identified by CL&P or government agencies in Connecticut to improve radio communication interoperability among public and private sector components of the workforce that need to coordinate closely for the most efficient use of time and resources used for the restoration effort.

F.1 Recommendation: As part of statewide communications interoperability efforts, DEMHS should work with CL&P and other utilities to identify and recommend steps to improve communications interoperability across radio systems used by agencies and crews that can will be involved in power restoration field operations.

G. Coordinating Mutual Assistance Assets and Contractors

Issue: While vital to provide needed capabilities, use of external mutual assistance and contract crews presents communication, reporting, and tracking challenges

because they often do not have the same communications or field reporting technology as used by local crews.

Background: As noted in section IV. A above, mutual assistance from power companies and contractors in other states are a vital component of large scale power restoration. Both UI and CL&P are members of the NEMAG, and CL&P is also a member of NYMAG. These include electricity providers in several northeastern states and Canadian provinces that agree to send crews to support each other's restoration efforts, if crews are available. CL&P also maintains a roster of contractors, may access contractors via mutual assistance, and may hire contractors during a restoration event. The huge increase in external crews that are brought in to assist, however, can present additional challenges related to management (see section IV.A above) and maintaining situational awareness (see section IV.D above).

CL&P uses a practice it calls "bird-dogging" in which CL&P staff accompany mutual assistance and contract crews to provide more up-to-date reporting on their activities. The volume of mutual assistance and contract crews compared to CL&P bird dogs still presents significant challenges during widespread outages.

Finding: Improved capability to capture status of restoration task-completion by mutual assistance crews and contract crews can improve timeliness of report and accuracy of information used for operational decision-making and prioritization.

> **G.1 Recommendation:** Utility providers, including CL&P, should implement procedures, and technology, if needed, to improve integration of status reporting by mutual assistance crews into operations reporting and restoration tracking processes.

H. United Illuminating Findings

The snowstorm was not as large an event for UI as for CL&P in that 52,000 UI customers, about 15 percent of its customer base, lost power. For comparison, in a total service area of approximately 350,000, during Hurricane Irene, UI had a peak of 158,000 customers out and a total of 201,000 outages. After the October snowstorm, all UI customers were restored by the night of Wednesday, November 2. The company reported maintaining good situational awareness throughout this event, though UI staff noted that the situation was much more challenging during Irene.

The company's greatest challenge was providing Estimated Restoration Times for individual towns or customers; the company is confident of its global restoration time model. UI reports having technology initiative in development to improve the granularity of individual forecasts. UI staff noted that in a large-impact event, its restoration organization and operation are able to scale up to respond, but it recognizes that communication with towns gets far more complex and challenging to manage in a larger event.

I. Areas for Additional Review

Several areas of improvement that can impact power outage severity and restoration capabilities were identified that are beyond the scope of this report. They are captured here for additional review and examination.

Vegetation Management

Connecticut's ample tree canopy, while beautiful, tends to increase the likelihood of power outages, given that electricity transmission and distribution infrastructure is primarily above-ground and frequently close to trees in the right-of-way. Utility companies have responsibility for vegetation management in their utility rights-of-way. However, utility companies must seek permission for tree-trimming on trees that are outside their rights-of-way yet may potentially have impacts on infrastructure. Proximity of heavy vegetation to power transmission and distribution lines can contribute to the likelihood of damage to power lines and resulting power outages in high wind, early snowfall, and ice events. While appropriate vegetation management can reduce outages and increase reliability, it can meet public resistance because of aesthetic, environmental, economic (tourism) and other issues.

Utility companies in Connecticut should work with local governments and communities to communicate the benefits of vegetation management both within and proximate to rights-of-way as a means of reducing power outages. Further review of industry best practices regarding vegetation management, including vegetation trimming cycle is recommended.

Infrastructure Hardening

Electricity providers are responsible for the power infrastructure on which residents and economic drivers in Connecticut depend. Utility providers serving Connecticut customers should consider, commit to, and regularly report on planning and investments in infrastructure resilience measures, including vegetation management, equipment and line improvements, and work toward underground placement of conductors and distribution lines.

Workforce Issues

CL&P permanent workforce has decreased over the past few decades, which is part of a national trend that includes greater reliance on contractors and mutual aid. Effects of the reduction in workforce are an issue for future consideration. In addition, the mutual aid system itself should be reviewed.

Regulatory Oversight

CL&P and UI are regulated by PURA and report to PURA, in accordance with state regulations and policy, regarding electricity transmission, distribution, and supply, compliance, and rate issues. PURA should review its regulatory requirements and ability to monitor utility preparedness and restoration capability improvements, including review of mutual assistance agreements and procedures for implementation. PURA, the state Office of Policy and Management, and a state ESF 12 or comparable functional group should be involved in review of restoration efforts and

infrastructure resilience issues and consider addressing issues and lessons from the snowstorm event in the state's ongoing energy assurance planning effort, which is coordinated by the Office of Policy and Management.

Other Critical Services

In addition to electricity, communications also are critical during large-scale outages. The state should review the restoration efforts of major telecommunications providers as well as cable providers upon which Connecticut citizens and businesses are increasingly dependent for voice-over-internet phones and internet services.

V. Conclusion

This October 2011 Snowstorm Power Restoration Report provides a quick evaluation as a basis for examination of key issues in the restoration effort and improvement planning by the state and by utility providers, particularly CL&P. The short time frame of this evaluation, less than four weeks, beginning before the restoration was complete through the end of November, necessarily limited the depth and breadth of its inquiry. The report provides information and key points for future examination and improvement efforts.

The October snowstorm caused the largest power outage in its history for CL&P, the state's largest electricity provider. While power to 800,000-plus customers was restored in an 11-day period, missteps by the company in terms of public communications added to a sense of frustration with the duration of the outage. Additional challenges were identified in decision-making to prepare for the storm, maintaining situational awareness, securing, and coordinating mutual aid and contract workforce, and coordination with local governments in some hard-hit areas.

Multiple issues and recommendations identified in this report are not new. Issues such as scalability of management for large-scale power outage, the need for improved planning, training and exercise, and coordination with municipalities were identified in after-action reviews of prior outage events. The consultant team recommends an improvement process that is ongoing, monitored, and combined with a commitment to public-private sector cooperation.

Improvements can be addressed on multiple issues through an inclusive planning process and the engraining of emergency plans and procedures in each entity's culture and operations. Plans are best developed with the input of those who will be involved in response. In many cases, it appears that public sector agencies were not involved in the development of CL&P's emergency plans and procedures, and CL&P was not involved in development of state and local government response plans and procedures. Adherence to accepted planning guidance regarding an inclusive planning process that emphasizes ongoing multi-agency involvement in preparedness (such as using Emergency Support Functions to organize responsibilities and preparedness activities) should be considered an improvement measure for the state's DEMHS – both for state plans and DEMHS guidance to local governments. While CL&P shared its new Emergency Response Plan with municipalities, there had been little or no opportunity to exercise the updated plan, which allows for practice of roles and responsibilities, identification of areas for additional resources or training, and work on coordination issues. Emergency response plans should become living documents engrained in the culture of local and state governments and utility providers, through a continuous cycle of exercise, training, and revision, for them to be effective in providing efficient coordination in response.

While state and local government and utility providers cannot prevent severe weather events from occurring, they have the ability and responsibility to address the issues identified in this report.

Appendices

Appendix A. Interviews Conducted

Organization	Participants
CL&P	
Chief Operating Officer	Jeff Butler, President/COO[i]
System Operations	Bob Hybsch, Vice President, Customer Operations Roderick Kalbfleisch; CL&P Director of System Operations
Mutual Assistance Coordinator	Mike Ahearn, Vice President, Utility Services (NU)
Emergency Management Officer	Mike Zuppone, Manager, System Restoration and Emergency Preparedness (NU)
Customer Services Director	Bill Quinlan, Vice President, Customer Solutions
Public Information Officer	Jessica Cain, Director of Customer Relations and Strategy
NU Communications/PR Director	Marie T. Van Luling, Director
NU Customer Experience	Johnny Magwood, VP Customer Experience Dan Comer, Director Kevin Charette, Director
United Illuminating Company	
Restoration operations team	James Cole, Incident Manager Joseph Flach, Incident Manager Charles Eves, Planning Team Lead Al Felice, Restoration Manager
State of Connecticut	
Governor's Office	Timothy F. Bannon, Chief of Staff Roy Occhiogrosso, Senior Advisor to the Governor
Office of the Attorney General	Nora Dannehy, Deputy Attorney General Michael C. Wertheimer, Assistant Attorney General John S. Wright, Assistant Attorney General
Department of Energy and Environmental Protection	Daniel Esty, Commissioner Jonathon Schrag, Deputy Commission for Energy Kevin DelGobbo, Chairman, Public Utility Regulatory Authority (PURA) Robert Klee, Chief of Staff Dennis Schain, Director of Communications

State of Connecticut	
National Guard	Major General Thaddeus Martin, Adjutant General Eugene Mascolo, Assistant Adjutant General
State Department of Emergency Management and Homeland Security	Bill Hackett, Director Brenda Bergeron, Legal Advisor Michael Varney, Statewide Interoperability Coordinator; Scott DeVico, Public Information Officer
Connecticut Department of Public Health Office of Public Health Preparedness	John Best, EMS Field Program Coordinator
Municipalities	
Avon	Brandon Robertson, Town Manager James DiPace, Fire Marshal
Bloomfield	Louie Chapman, Jr., Town Manager Donald Moore, Emergency Management Director
Bristol	Mayor Arthur J. Ward Edward Krawiecki, Corporation Council Walter Beselka, Director of Public Works Robert Longo, Superintendent, Water Department
East Hartford	Marcia Leclerc, Mayor Scott Chadwick, Corporation Counsel Mike Walsh, Director of Finance John Oates, Fire Chief Tim Bockus, Director of Public Works
Fairfield	William Heine, Citizen
Farmington	Kathleen Eagen, Town Manager Russell Arnold, Jr., Director, Public Works/Town Engineer Paul Melanson, Chief of Police Scott Zenke, Highway & Grounds Superintendent, Public Works and Development Services
New Britain	Timothy Stewart, Mayor
Simsbury	Mary Glassman, First Selectwoman Tom Cook, Director of Administrative Services Peter Ingvertsen, Police Chief

Municipalities	
Stafford	Mike Krol, First Selectman Richard Shuck, Selectman-elect Frank Prochaska, Emergency Management Director (EMD) Dennis Milanovich, Town Engineer
Union	Andy Goodhall, First Selectman
Vernon	Jason McCoy, Mayor William Meier, Lt. Vernon Police Department William Graugard, Captain Vernon Fire Department John Ward, Town Administrator
Other	
International Brotherhood of Electrical Workers (IBEW)	Frank Cirillo, John Unikas (Local 420) Brian Kenney (Local 455) John Fernandes (Local 457) Rich Sank (Local 457) Ed Collins (IBEW International Representative)

Appendix B. Documents Reviewed

State of Connecticut Agencies

- Connecticut Department of Emergency Management and Homeland Security, "State-Wide Strategy 2010-2015", (December 2009)
- Connecticut Department of Emergency Management and Homeland Security, "Model Local Emergency Operations Plan", (August 2009)
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Appendix C. Friday, October 28, 2011, 9:45 a.m., Weather Advisory

WINTER STORM UPDATE
Friday October 28, 2011
9:45 AM

DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION

Reuben F. Bradford, Commissioner

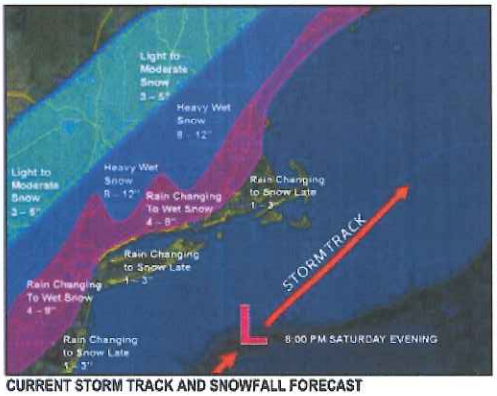
VERY RARE MAJOR WINTER STORM EXPECTED ON SATURDAY...
WINTER STORM WATCHES ISSUED FOR LITCHFIELD, HARTFORD, TOLLAND, WINDHAM AND NORTHERN FAIRFIELD AND NORTHERN NEW HAVEN COUNTIES...
SIGNIFICANT POWER OUTAGES EXPECTED...

The National Weather Service has issued Winter Storm Watches for much of Connecticut, Southeastern New York, and Central New England for Saturday Afternoon and Saturday night.

The latest computer models are forecasting that a major Winter Storm will impact our area Saturday Afternoon and Saturday night with heavy wet snow across interior Connecticut and a mix of rain and snow at the coast. The latest track forecast for this storm is predicting that a low pressure system will form off the North Carolina Coast Saturday morning and then rapidly intensity as the storm moves Northeast Saturday afternoon. Rain and wet snow are forecast to move into Southern Connecticut around noon on Saturday and changeover to all wet snow by late-afternoon away from the immediate coast. The wet snow is expected to become heavy at times Saturday afternoon and continue into Saturday night before tapering off to flurries before daybreak on Sunday. Total snowfall is expected to be elevation dependant with valleys receiving 4 – 8 inches away from the immediate coast and the higher terrain above 500 – 1000 feet receiving up to 12 inches of heavy wet snow.

The main threat from this storm will be from the heavy wet snow bringing down tree limbs and some whole trees causing a significant number of power outages. A secondary threat from this storm will be from very heavy snow which will result in very poor driving conditions Saturday evening.

The Department of Emergency Services and Public Protection (DESPP) will continue to monitor the latest forecasts and will issue another update at 2:00 PM this afternoon.



CURRENT STORM TRACK AND SNOWFALL FORECAST

CURRENT WATCHES AND WARNINGS

This product is a public service of the Department of Emergency Services and Public Protection (DESPP), and is intended for informational purposes only. DESPP assumes no liability for the use or distribution of this product or any actions resulting from this product.

STATUS OF THE STATE EMERGENCY OPERATIONS CENTER

MONITORING

SIEMENS

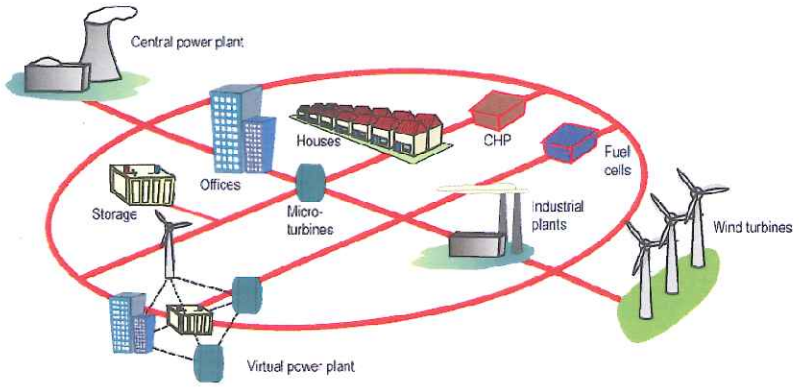
Evolution to the Intelligent Grid: Smart Grid Possibilities

Ken Geisler
Vice President of Strategy
Smart Grid Division
Siemens Infrastructure & Cities Sector
Minneapolis, Minnesota, USA

December 2, 2011

SIEMENS

A Smarter Greener Power Grid



Smart Grid:

- **Improved Energy Delivery**
- **Informed Consumption**
- **Reduced Environmental Impact**

From	To
Limited consumer choice	Expanded consumer choices
One-way communication	Two-way communication
Few sensors & analog control	Pervasive monitoring & digital control
Reactive maintenance	Condition-based maintenance
Manually Intensive Processes	Automated "Self-Healing"

Smart Grid Extends from Generation through Consumption…
3 Pillars of Domain Expertise

Communications Technology	Operations/Information Technology	Production/Utilization/ Delivery Technology

Source: European Technology Platform SmartGrids, Vision and Strategy for Europe's Electricity Networks of the Future, V4.0, 24.2.2006

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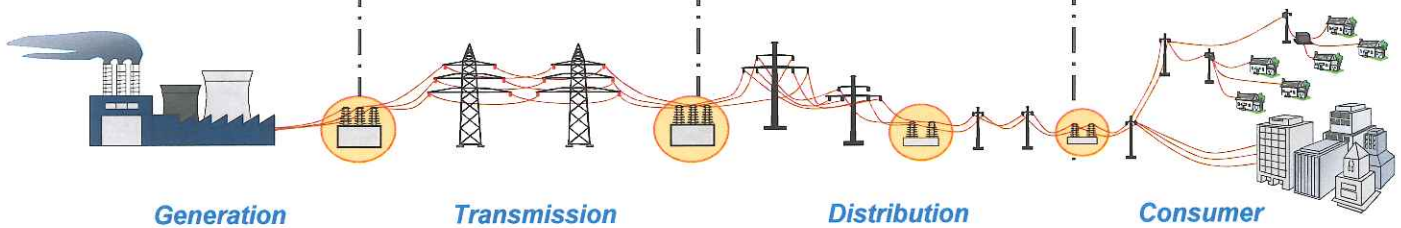
Solutions Landscape: Elements

	Generation	Transmission	Distribution	Consumer
Enterprise	▪ Asset Performance Management System ▪ Generation Planning	▪ Common Modeling	▪ Historical Information	▪ Engineering & Planning (T&D)
Analysis	▪ Energy Market Management (P) ▪ Gen Optimization	▪ Energy Market Mgmt (O) ▪ Trans Network Analysis ▪ Dynamic Assessment	▪ Dist Network Applications ▪ Dist Training Simulator	▪ DER Optimization ▪ DR Modeling ▪ Load Modeling
Control	▪ Distributed Control System	▪ SCADA ▪ Auto Gen Control ▪ Wide Area Monitoring	▪ Distribution SCADA ▪ Outage Mgmt Sys ▪ Mobile Work Force Mgmt	▪ DER/DR Management ▪ MDMS
Communi-cations	▪ In Plant (LAN)	▪ Satellite ▪ µWave ▪ Fiber ▪ Radio	▪ Cell ▪ Telephone ▪ BPL ▪ Fiber ▪ µWave ▪ Radio	▪ PLC, WIFI, WIMAX ▪ BPL ▪ Manual
Apparatus & Device	▪ RTUs, Data Concentrators ▪ GTs, CCP, ST, WP	▪ Breakers ▪ Cap Banks ▪ Xfrmrs ▪ FACTS/SVCs ▪ Volt Regs ▪ PMUs	▪ Dist Auto ▪ Reclosers ▪ Cap Banks ▪ Tiered Cont. ▪ Switches ▪ Xfrmrs	▪ Auto Meter Reading ▪ DSR (Customer) ▪ Home Area Networks



Generation *Transmission* *Distribution* *Consumer*

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Solutions Landscape: Interdependent Layers

Enterprise	Asset Performance Management System Generation Planning	Common Modeling	Historical Information	Engineering & Planning (T&D)
Analysis	Energy Mkt Mgmt (P) Gen Optimization	Energy Mkt Mgmt (C) Dynamic Assessment	Dist Network Application	DER Optimization DR Modeling Load Modeling
Control	Distributed Control System	SCADA Wide Area Monitoring	Distribution SCADA Mobile Work Force Mgmt	DER/DR Management MDMS
Communi-cations	In Plant (LAN)	Satellite µWave	Cell µWave	Telephone Radio	PLC, WiFi, WiMAX Manual
Apparatus & Device	RTUs, Data Concentrators GTs, CCP, ST, WP	Breakers Volt Regs	Cap Banks PMUs	Dist Auto Switches	Reclosers Alarms	Auto Meter Reading HSR (Customer) Home Area Networks

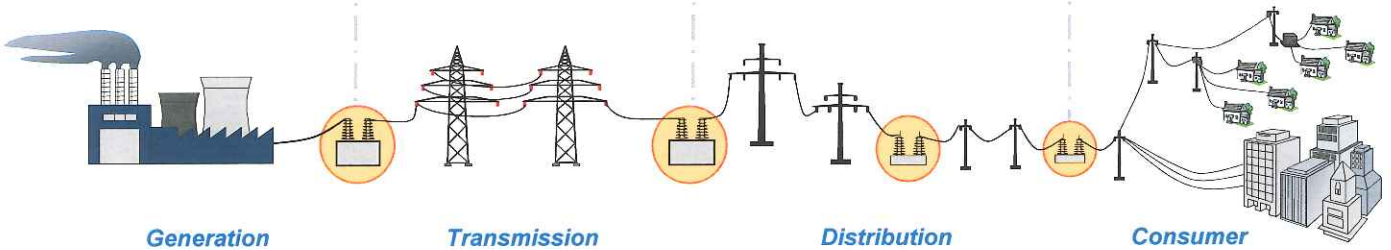
Enterprise-wide Resource Optimization

Knowledge-based Decision Support

Real-time Integrated Operations

Ubiquitous Cost-effective Communications

Distributed Intelligent Apparatus/Devices



Generation *Transmission* *Distribution* *Consumer*

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Main Value Propositions of Smart Grid - Utility

Reliability

- Distribution grid is primary focus (automation and metering, grid and customer)
- Translates to "stability" for transmission (synchrophasors, wide area management, dynamic stability, large scale renewable integration)

Efficiency

- Primary focus is management of distribution field crews
- Secondary focus on T&D operations and maintenance management staff

Safety

- Integration with control centers to maintain crew safety standards
- Protection design/controller changes to support eventual micro-grid operations

Market/environment preparation

- Demand side management and response
- Distributed energy resource (DER) integration
- Building and home energy management

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Distribution Operations Focus on Reliability

Outage Location	Outage Statistics*	Contribution to Reliability Calculations*	Solution Focus
Substations	1%	5%	EMS Integration with DMS
Primary Distribution Circuits	44%	87%	Delivery Grid Design, DA, DER, DMS
Secondary Distribution	55%	8%	MDMS/AMI Integration with DMS

* Source: EPRI DA Report 2005

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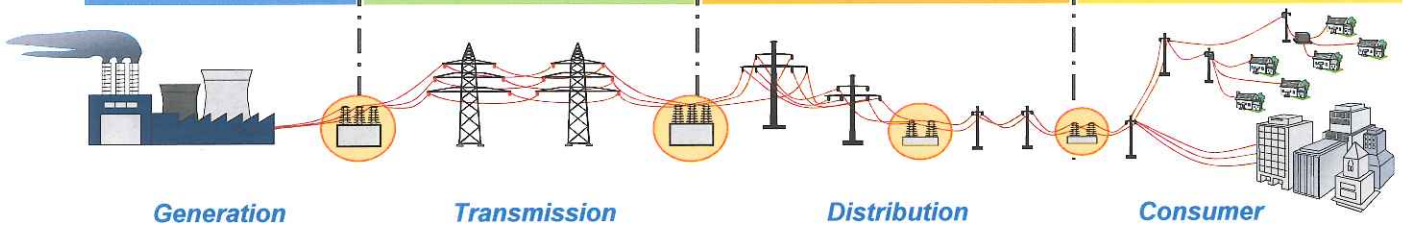
Solutions Landscape: Solution Groups

Enterprise	Asset Performance Management System Generation Planning	Common Modeling	Historical Information	Engineering & Planning (T&D)
Analysis	Energy Market Management (P) Gen Optimization	Energy Market Mgmt (O) Trans Network Analysis Dynamic Assessment	Dist Network Application Dist Training Simulator	DER Optimization DR Modeling Load Modeling
Control	Distributed Control System	SCADA Auto Gen Control Wide Area Monitoring	Distribution SCADA Outage Mgmt Sys Mobile Work Force Mgmt	DER/DR Management MDMS
Communi-cations	In Plant (LAN)	Satellite, µWave Fiber, Radio	Cell, Telephone BPL, Fiber µWave, Radio	PLC, WIFI, WIMAX BPL Manual
Apparatus & Device	RTUs, Data Concentrators GTs, CCP, ST, WP	Breakers, Cap Banks Xfrmrs, FACTS/SVCs Volt Regs, PMUs	Dist Auto, Reclosers Cap Banks, Tiered Cont. Switches, Xfrmrs	Auto Meter Reading DSR (Customer) Home Area Networks
	GMS	**EMS**	**DMS/DA**	**DRMS/MDMS/AMI**



Generation *Transmission* *Distribution* *Consumer*

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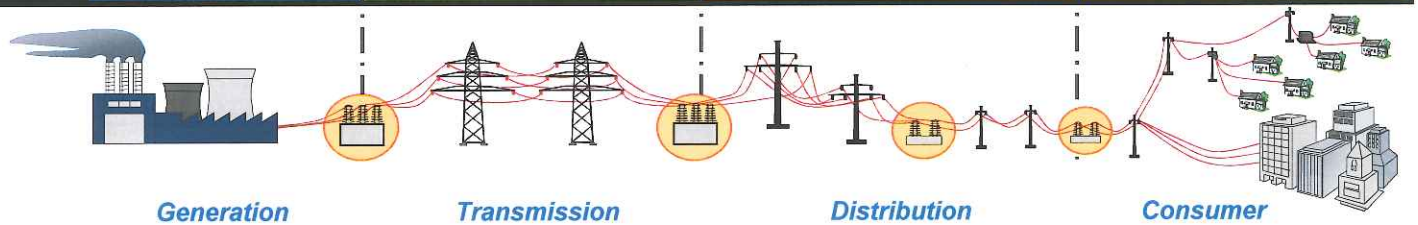
Solutions Landscape: Relationship to Smart Grid

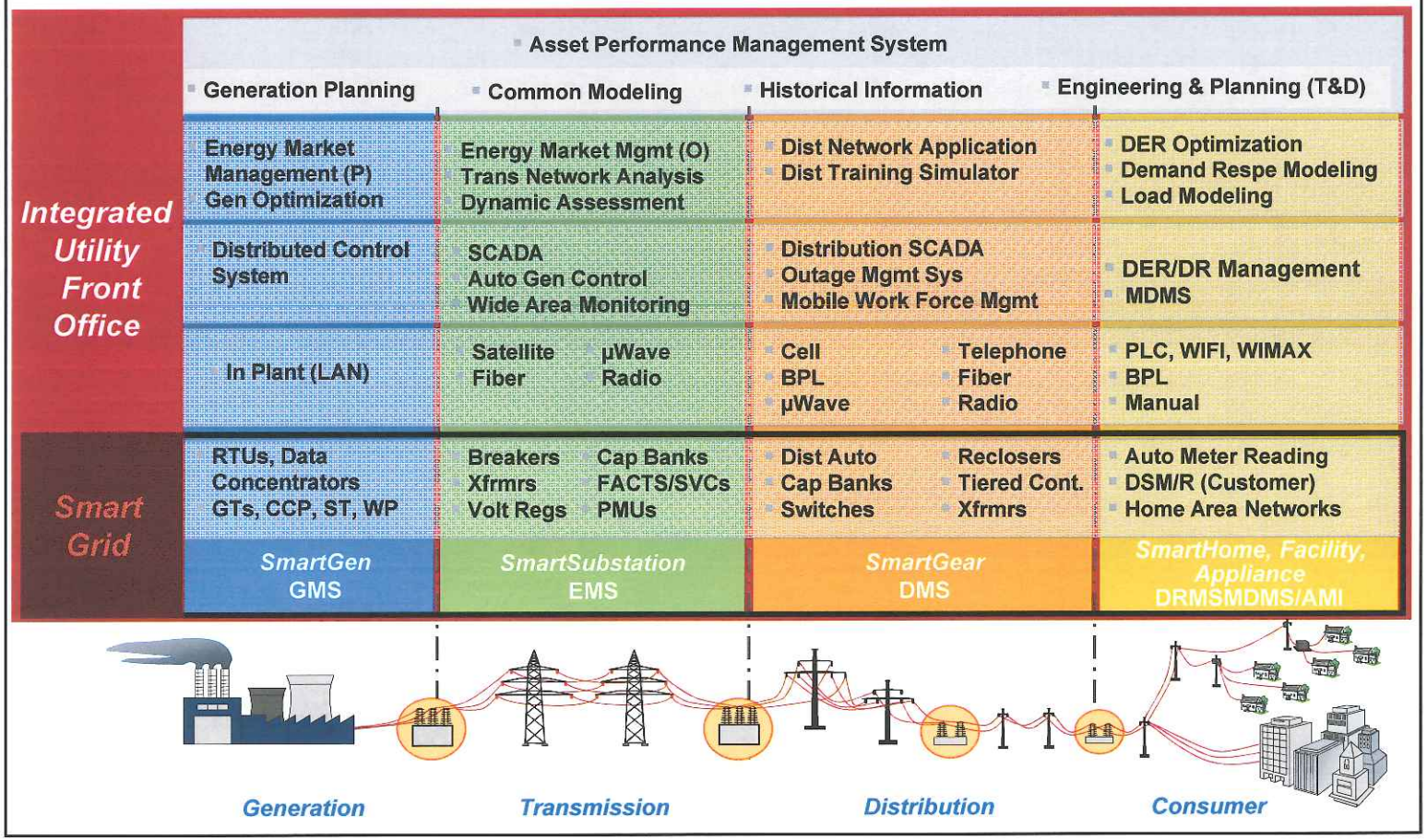
Enterprise	▪ Asset Performance Management System ▪ Generation Planning ▪ Common Modeling ▪ Historical Information ▪ Engineering & Planning (T&D)			
Analysis	▪ Energy Market Management (P) ▪ Gen Optimization	▪ Energy Market Mgmt (O) ▪ Trans Network Analysis ▪ Dynamic Assessment	▪ Dist Network Application ▪ Dist Training Simulator	▪ DER Optimization ▪ DR Modeling ▪ Load Modeling
Control	▪ Distributed Control System	▪ SCADA ▪ Auto Gen Control ▪ Wide Area Monitoring	▪ Distribution SCADA ▪ Outage Mgmt Sys ▪ Mobile Work Force Mgmt	▪ DER/DR Management ▪ MDMS
Communi-cations	▪ In Plant (LAN)	▪ Satellite ▪ µWave ▪ Fiber ▪ Radio	▪ Cell ▪ Telephone ▪ BPL ▪ Fiber ▪ µWave ▪ Radio	▪ PLC, WIFI, WIMAX ▪ BPL ▪ Manual
Smart Grid	▪ RTUs, Data Concentrators ▪ GTs, CCP, ST, WP	▪ Breakers ▪ Cap Banks ▪ Xfrmrs ▪ FACTS/SVCs ▪ Volt Regs ▪ PMUs	▪ Dist Auto ▪ Reclosers ▪ Cap Banks ▪ Tiered Cont. ▪ Switches ▪ Xfrmrs	▪ Auto Meter Reading ▪ DSM (Customer) ▪ Home Area Networks
	SmartGen	*SmartSubstation*	*SmartGear*	*SmartHome, Facility, Appliance*



Generation *Transmission* *Distribution* *Consumer*

The Integrated Utility Enterprise: Leveraging Smart Grid

SIEMENS



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Transformation to Smart Grid - Community

Movement from Static As-Designed Infrastructure to a Proactive Intelligent Infrastructure and Operation

From:

- Centralized remote fossil generation
- Consumer "always-on" standard rate base
- Generation follows demand
- Design for capacity/reliability through equipment sizing and redundancy
- Process prioritization for critical community infrastructure

To:

- Broader use of distributed green energy resources
- Informed consumer energy usage and rate options
- Consumers as participants in demand management (demand follows generation availability)
- Reliability improvements through automation
- Graceful degradation considering critical infrastructure
- Reduced emissions

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KCP&L Green Impact Zone ARRA Funding Program

green impact zone

The Green Impact Zone is a cooperative effort to focus federal stimulus funds on projects in a targeted area of Kansas City, Mo. — bounded by 39th Street on the north, 51st Street on the south, Troost Avenue on the west, and Prospect to 47th to Swope Parkway on the east.

The project, proposed by U.S. Rep. Emanuel Cleaver II, will put people and dollars to work to strengthen neighborhoods, create jobs and improve energy efficiency.

big goals

- Weatherize every home in the zone
- Train jobless residents to do the weatherization work
- Work with Kansas City Power & Light to deploy a "smart" electricity grid in the zone
- Develop a sustainable land-use plan for the zone
- Support green initiatives and demonstration projects in the zone

big impact

- Creates jobs
- Provides training that helps people develop lasting, marketable skills
- Reduces energy consumption
- Revitalizes neighborhoods
- Serves as a model for other communities across the nation

Green Impact Zone Demographics:

Population	8,374
Black, Non-Hispanic	89%
Hispanic	2%
White, Non-Hispanic	7%
Other	2%
Single-Parent Households	25%
Persons in Rental Units	48%
Persons in Poverty	31%
Median Household Income	$22,397
Per Capita Income	$12,239

Active Neighborhood Organizations:

Ivanhoe Neighborhood Organization
Historic Mannheim Park Association
Troostwood Neighborhood Association
49/63 Neighborhood Association
Blue Hills Neighborhood Association
Town Fork Creek Neighborhood Association
Blue Hills Community Services
Neighborhood Housing Services
Swope Community Builders
Brush Creek Community Partners

MARC
Mid-America Regional Council

Mid-America Regional Council
600 Broadway, Suite 200, Kansas City, MO 64105
www.marc.org/greenimpactzone

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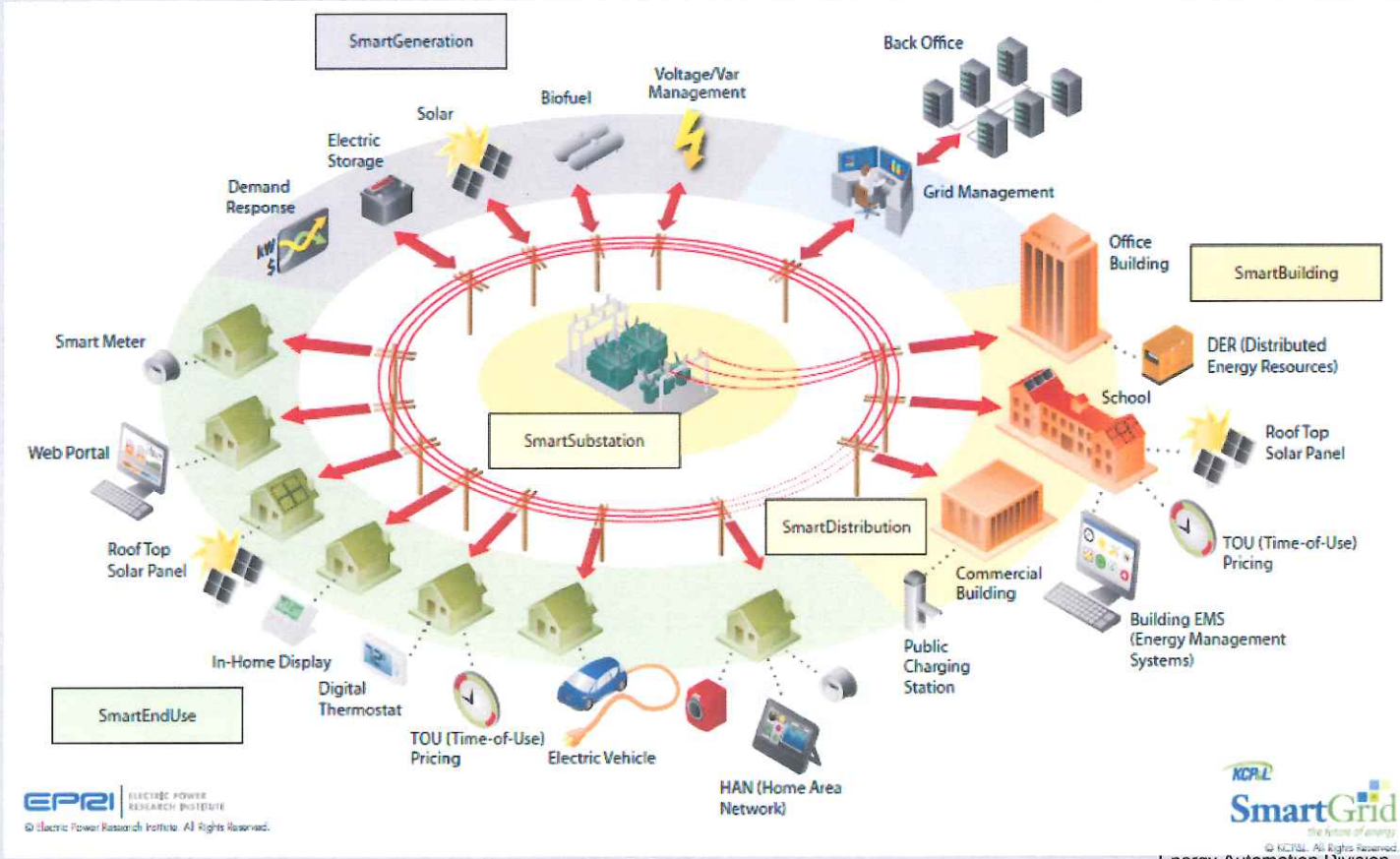
KCP&L ARRA DOE Smart Grid "Green Impact Zone"



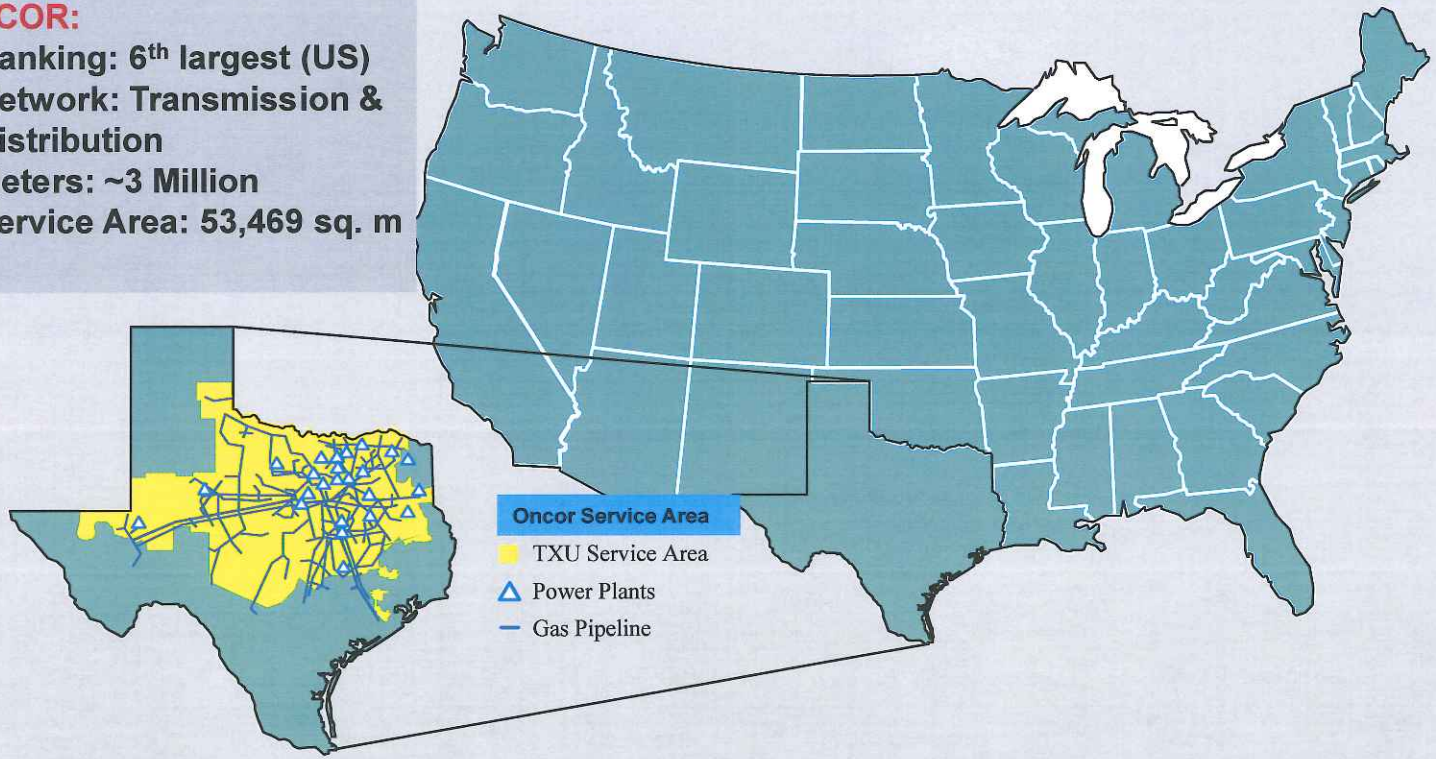
Energy Automation Division

SIEMENS

Texas USA – Oncor Service Territory

ONCOR:

- **Ranking: 6th largest (US)**
- **Network: Transmission & Distribution**
- **Meters: ~3 Million**
- **Service Area: 53,469 sq. m**



Energy Automation Division

ONCOR ELECTRIC DELIVERY
Smart Grid Applied System Program

SIEMENS

Circuit miles of transmission:
345 kV: 4,100 miles
138 kV: 6,529 miles
69 kV: 2,843 miles
Substations: 864
Autotransformers: 145
Circuit breakers:
- High voltage: 1,535
- Low voltage: 4,123

Square miles of system: 53,469

Longest distribution feeder - 248 miles

Number of Counties: 92

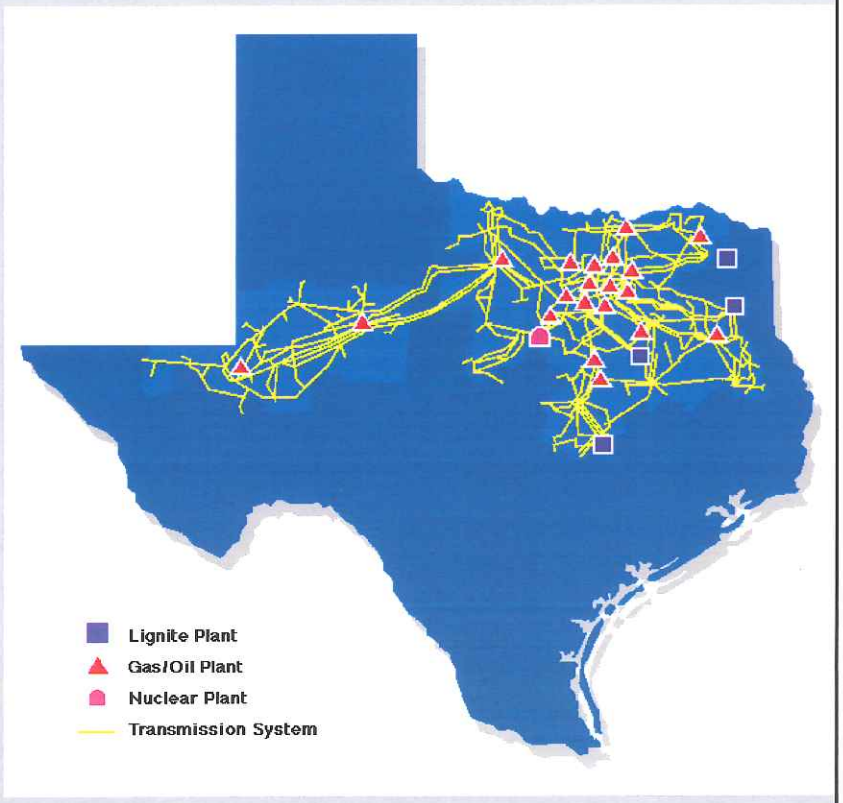
Number of Cities: 370

Total 3 phase: 26,864 miles

Total 1 phase: 44,481 miles

U.S.'s highest-growth region in electric demand (NERC) of 2.5%

Annual growth of 5% over the past 5 years in the number of premises served.



Energy Automation Division

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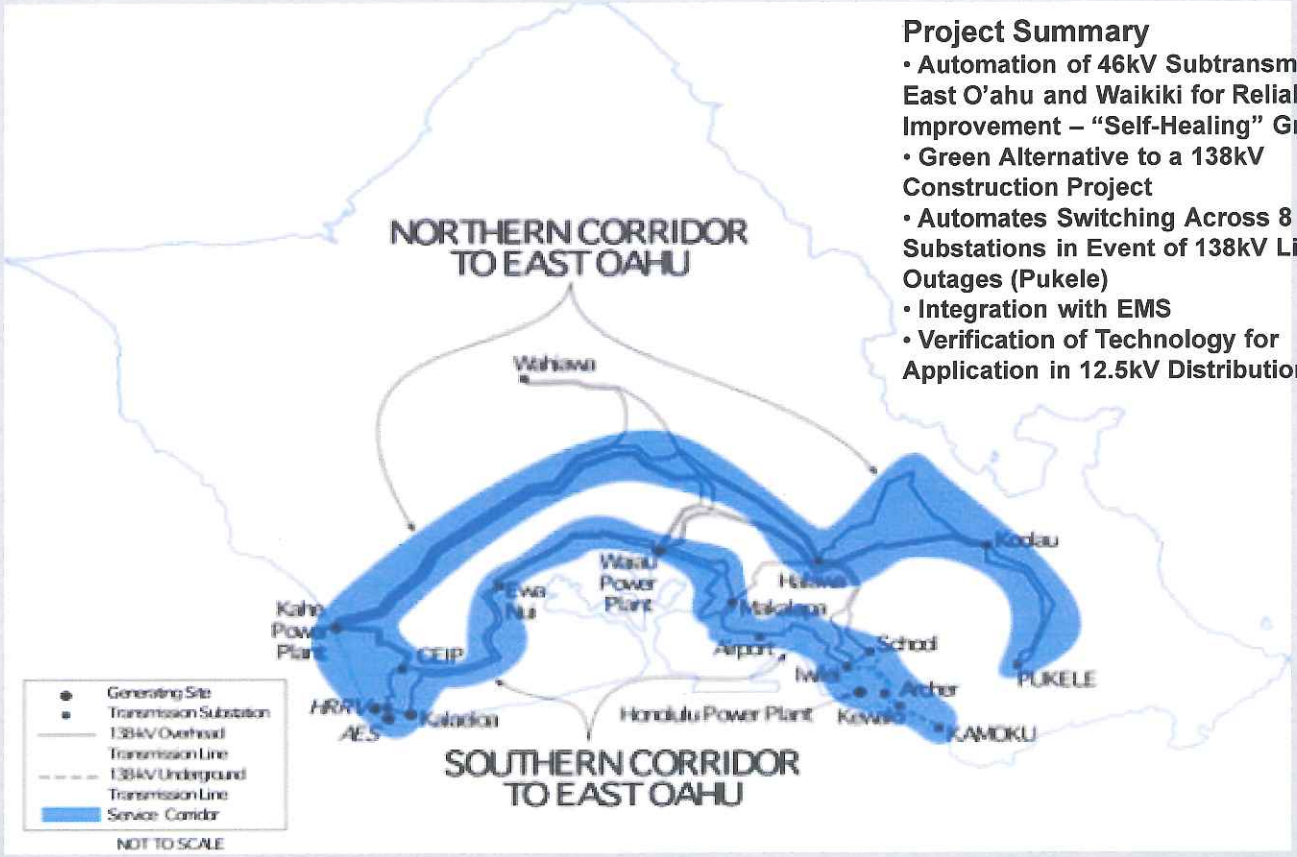
HECO ARRA DOE East O'ahu Transmission Project



Project Summary

- Automation of 46kV Subtransmission East O'ahu and Waikiki for Reliability Improvement – "Self-Healing" Grid
- Green Alternative to a 138kV Construction Project
- Automates Switching Across 8 Substations in Event of 138kV Line Outages (Pukele)
- Integration with EMS
- Verification of Technology for Application in 12.5kV Distribution Grid

Energy Automation Division

A Western Utility's Smart Grid Roadmap Decision Framework

SIEMENS

Time Frame	2009-2011	2011-2015	2015-2020	2020-2030
Objectives	• Mobilize Smart Grid Transformation Process • Identify/Verify Key Design/Deployment Methodologies and Supporting Technologies • Execute Prioritized High Value Programs • Establish Plan for Multi-company Common Technology Convergence/Leverage	• Refine Design/Deployment Methodologies, Course Correct • Verify Key Technology and Solution Scalability • Incorporation of significant DER in Distribution System • Prioritized Rollout by Value Assessment • Expand on Transmission System Preparation and Renewable Energy Resource Integration	• Full Deployment of Established Technologies and Processes • Verification/Integration of Initial Large Scale Renewable Energy Resources (Target 30% of 2030) • Assess Management of Combined Aggregate Load and DER reserve • Expand Distribution DER and aggregate demand management/response	• Rollout of Integrated Renewabl Energy Resources to Achieve 2030 targets • Expand Demand Management and Response Programs • PHEV Expansion • Fully Integrated Island Utility Systems
Capabilities	• Subset of staff retrained in new paradigm • Change Management know-how and plan • T&D O&M Process Changes • Prepared for Transformation to Smart Grid paradigm	• Strengthened Distribution and Transmission Grid • Integration of Distributed Energy Resources • Pervasive and secure communications established • Change Management process on-going	• Ability to incorporate large variable generation into network • Ability to Model and Manage more dynamic stability issues • Integrated Transmission and Distribution Demand Management (Surgical) • Microgrid management and PHEV Integration	• Fully integrated Operations and Maintenance Processes and Systems with Large Scale Renewable Energy Resources • Broad integrated DER • PHEV integration on communit scale
Value	• Initial reliability, efficiency, and safety gains acquired in Distribution • Initial gains quantifiable and demonstrable to PUC • Related initial cost savings achieved and prioritized next steps	• Scaling of reliability, efficiency and safety gains • Consumer enablement established • Prepared to Incorporate Large Scale Renewable Resources • Improved Asset Utilization	• Significant reduction in dependency on non-renewable energy resources (reduced fuel costs) • Direct access to Demand and Demand offset to compensate variability of generation • Continued gains in asset utilization and efficiency	• Adherence to governmental renewable objectives • Managed reduction in non-renewable fuel costs and dependencies • Reliability and efficiencies improved or maintained • Transmission Stability • DER, DSM/R/PHEV establishe
Key Technology Area Focus	• Transmission Stability/PMUs, Data Collectors • Distribution Reliability/Operations (DMS, SSA, DA, Design/Planning, Fault Location) • Crew Efficiency/Metering (AMI, MDMS) • Customer facing/Demand Management/Response • Communications and Security • Standards and Solution Integration • DISTRIBUTION/CONSUMER	• Real-time Information Filtering • Large Scale Visualization • Micro-Grid Protection and Control • Real-time Transmission Dynamic Stability • Consumer Demand Management and Response • Wind Forecasting and Capacity Alternative Planning • PHEV Technology and Analysis Modeling • TRANSMISSION/DER	• DC Cable/Station Modeling and EMS Application Enhancement • Demand Reduction/Offset Capacity Assessment and Management • PHEV Operations Analysis Applications • Large Scale Variable Generation Dispatch and Management • RENEWABLES - DSM/R	• Large Scale Wind and Dispatch Analysis • Demand Resource Optimizatio RENEWABLES/ DSM/R / PHEV


SIEMENS
Discussion:
Cultural Change Management
Government, Community, Utility, Vendor Interdependencies
Ken Geisler
Vice President of Strategy
Smart Grid Divvision
Siemens Infrastructure & Cities Sector
Minneapolis, Minnesota, USA
December 2, 2011

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1. BACKGROUND:

Good Afternoon. I'm Major General Thad Martin, the Adjutant General and commander of the Connecticut National Guard. I'm joined by BG Gene Mascolo Director of the Joint Staff and Task Force Commander for the CTNG's Irene and Alfred responses.

The Connecticut National Guard consists of approximately 3,500 soldiers and 1,200 airmen providing Connecticut with a force of 4,700 personnel. Approximately 1,100 of these personnel are full-time, "uniformed", federal employees with 740 from the Army Guard and 330 from the Air. To provide a bit of perspective the Connecticut Military Department total operating budget is around $270 million a year. Only 2.5% or about $6.5 million of that comes from the state, the remainder is funding we receive from the federal government.

Your National Guard performs duty in one of three very different statuses. The first is Title 10, the traditional war time mobilized role where units and members look to the President as their Commander in Chief. The second is Title 32 status which is normally federally funded military training that pays for the traditional 1 weekend a month and a 2 week summer camp each year. Although federally funded, soldiers and airmen in this status still look to the Governor as their Commander in Chief. The third and final status is duty performed under CGS 27 or what we call State Active Duty. State Active Duty is state funded and in some cases reimbursed by the federal government. The Governor is the Commander in Chief during all SAD. When missioned in our federal role (Title 10) we provide forces; trained and equipped to deploy to conduct a wartime mission. In our state role, we provide forces; to protect life and property in a disaster response and preserve peace, order and public safety in civil disturbance, homeland security and homeland defense missions.

Both the Army and Air National Guard group their personnel and capabilities into successively smaller modular organizations called units. These units are almost exclusively organized and trained to support their federal or wartime mission. Organizing and training units this way makes them well suited for deployment in their state role with much of their equipment and training funded by the federal government. When these forces are used in direct support to the state, the state is normally responsible for some or all of the cost.

When our Guardsmen are in a status referred to as state active duty personnel and equipment costs are billable back to the state at 100%. Under certain circumstances, such as "Immediate Response," generally defined as a response to save lives, prevent suffering or mitigate great property damage, we can leverage federal funding for only a limited period of time. This generally applies to the first 48 hours of a disaster response.

At some point, our response transitions from a phase where life safety and property is at risk to one in which we are mitigating or recovering from the effects of the disaster. At this point, the responsibility to pay for Guard support rests with the state. Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the states can receive some relief from the cost burdens of a disaster response if the president grants the state a Federal Emergency Declaration. Once granted, the federal government pays up to 75% of eligible expenses. This may include some of the costs for the Guard response.

Army and Air National Guard units possess a broad spectrum of unique capabilities. Since the National Guard is organized by state, each state is fielded a set of capabilities the state's population and demographics can support. The goal across the nation is to field a minimum set of capabilities required for a baseline domestic response to each state. These 10 capabilities, Command and Control, CBRNE response, Maintenance, Aviation, Engineering, Medical, Communications, Transportation, Security and Logistics are all provided for at some level in the Connecticut National Guard's force structure.

The Joint Force Headquarters is the operational and administrative headquarters for the Connecticut National Guard. Joint Force Headquarters is a unit containing both Army and Air National Guardsmen. Joint Force Headquarters is staffed and organized to assist me in meeting the operational requirements of the Connecticut National Guard.

When the Connecticut National Guard deploys in support of state missions it is organized into a temporary organization called a Joint Task Force or JTF. A JTF contains personnel and capabilities from both the Army and the Air National Guard organized into tailored organizations designed to meet the assigned mission. The JTF headquarters and support staff are primarily Joint Forces Headquarters members that are augmented with personnel from other Army and Air National Guard units or functions. Normally, a Connecticut National Guard JTF is commanded by an Army or Air Guard 1 star general. The JTF dissolves when the domestic mission is complete.

As Director of the Joint Staff, Brigadier General Mascolo serves as the JTF commander for the Guard's domestic responses. Brigadier General Mascolo commanded JTF Guardian, the Connecticut National Guard's response to Tropical Storm Irene and JTF October, the response to Winter Storm Alfred.

2. PREPARATION AND DEPLOYMENT:

As stated earlier, the National Guard's core competencies constitute an excellent disaster response tool readily available to the state, however to be clear we are NOT first responders. Local and state resources are always employed first with the National Guard standing by to fulfill mission assignments that exceed the capabilities of the state and locals authorities to support.

It's also important to state again, a National Guard response is not free. We do our best to leverage all programs legally at our disposal to reduce cost to the state however at some point there is a price for use of the Guard. For example, total costs for the state portion of the National Guard response to Tropical Storm Irene reached around $350,000. Costs for Winter Storm Alfred surpassed that with estimates of around $525,000 for approximately 10 days of response.

The Connecticut National Guard is primarily a part-time force. Approximately 75 percent of our Guardsmen have full time civilian employment and drill only one weekend per month and approximately 2 weeks during their annual training period.

During a "notice" event, such as Winter Storm Alfred, early forecasts of a storm with significant impact allows for us to begin planning. We begin our preparations by identifying potential mission sets from nearly 80 prescripted emergency responses normally associated with the type of event. We then direct our full-time force to prepare and stage support equipment and begin preparations for mobilizing our part-time Guardsmen.

Under the best conditions, from a cold start or in the event of a "no-notice" event, such as an earthquake or a tornado, we can have full time boots on the ground within 2 hours Monday through Friday. When our full-time force is off duty, we expect them to be on the ground within 4 hours.

A "notice" event provides us the ability to prepare our response ahead of time. We can stand up required command and control early and bring in elements of the Guard's part-time leadership. As a predicted event becomes more ominous, we can even bring on a percentage of the part-time force to augment our response force. In the face of dire predictions, we have the ability to mobilize the entire force to their armories and "shelter in place", positioned to provide quick response when conditions permit.

The nature of our part-time organization requires us to, as we say, lean forward in the foxhole in order to shorten our response times. In August for example, we deployed around 1,000 Guardsmen to their armories to "shelter in place" prior to Tropical Storm Irene's landfall. Since Irene hit on the weekend, we were able to leverage drill status Guardsmen to mitigate "initial response" costs to the state. In the case of Irene and Winter Storm Alfred our early preparations paid off.

With the approach of Winter Storm Alfred, we issued our first "ALERT Order" on Friday 28 OCT as the forecast began predicting significant impact to Connecticut. We identified 13 potential mission sets that addressed the impact of flooding, power outages and a winter storm. These mission sets included use of National Guard facilities as temporary shelters, high water and 4 wheel drive vehicle evacuation, debris clearance and power generation. Our full-time force began to prepare and stage equipment to support the potential deployment.

Since the storm was to hit on the weekend, we identified a drilling unit whose duty status could be leveraged for the operation's immediate response phase. We augmented our command and control staff on Saturday 29 OCT with personnel from our Joint Forces Headquarters and Joint Staff. This initial staff element would become the nucleus of our Joint Task Force Headquarters.

Throughout the day on Saturday, as the impact of the storm became more clear, we issued an additional ALERT order to focus our preparations; increased readiness levels with a WARNING Order; and then finally issued an OPERATIONS Order mobilizing selected capabilities the next day. Readiness levels for many of the remaining capabilities such as commodities distribution were increased, shortening the response timeline.

Requests for the Guard came in early Sat 29 Oct, with the Bradley Air National Guard base called upon to prepare to shelter up to 1,000 airline passengers stranded at Bradley International Airport. The mission was cancelled however the Air National Guard was ready to respond by late SAT night.

By Sunday 30 OCT, resources to execute command and control, on site assessment, debris clearance and power generation were mobilized. Preparations made by the full-time force paid off with our first power generation mission conducted on Sunday.

On Monday morning, 31 OCT, Joint Task Force October was activated, under the command of Brigadier General Mascolo. JTF October was task organized under a functional organization. Two major headquarters aligned under JTF October were stood up with the intent of executing the major mission areas of support and security.

The Army National Guard's 143d Area Support Group commanded by COL Mike Wieczorek became Joint Task Force Support since units possessing the resources to execute the majority of the required mission sets were resident in his units.

Other units from the Army and Air National Guard were mobilized to participate in the Winter Storm Alfred response. The Army National Guard's 85th Troop Command commanded by COL Ron Welch, the other primary subordinate command stood ready to mobilize and perform any required security missions. Later in the response, when no security missions materialized, the 85th Troop Command was designated as a reserve command.

The Air National Guard's 103rd Air Control Squadron commanded by Lt.Col. Bill Neri and JTF Aviation, under COL Bill Shea were mobilized and contributed to the effort providing manpower, equipment and special skill sets. These units provided power generation and helicopter support respectively.

As the complexity of the response grew, a Joint Task Force formed from the Connecticut Air National Guard's 103d Air Operations Group under the command of COL Pete Depatie was established. This unit was mobilized to provide additive debris removal capability in the north central part of the state as power outages continued.

Staffing for JTF October fluctuated throughout the response from initial staffing levels of 280 Guardsmen on Sunday 30 October to nearly 500 on Sunday 6 NOV. The first surge came on Tuesday 1 NOV in support of the establishment of Task Force Tiger, the commodities point of distribution at East Hartford's Rentschler Field. The surge to establish a commodities point of distribution or POD at "the Rent" brought the force to 410.

The Army National Guards' 143d Combat Support Sustainment Battalion under Lieutenant Colonel Ralph Hedenberg formed the nucleus for JTF Tiger. JTF Tiger was augmented with personnel and equipment from across the Army and Air National Guard.

Staffing was reduced accordingly following the surge necessary to establish the POD. We surged again to our highest levels of around 500 when the governor directed our debris clearance resources to the hard hit area of north central Connecticut centered around the 4 town area of Simsbury, Avon, West Hartford and Farmington.

Throughout the response, the Connecticut National Guard maintained "reach-back" capability with its full-time force. The full-time force of around 1,100, was somewhat depleted by the establishment of JTF October however it still provided a reach back capability of around 750 throughout the week.

The full-time force contributed to the ongoing effort throughout, providing service, "incidental to support" of the mobilized force while serving in their full-time capacity funded by the federal government. In addition to service "incidental to support", the full-time force also provided a hedge against uncertainty. During normal duty hours, our full time force of around 750 stood ready to respond if the event unexpectedly shifted back to a life safety or property damage challenge. With the state response of around 500 mobilized Guardsmen and our cost effective "reach-back" capability in our full-time force, around 1,200 Guardsmen were consistently available during Winter Storm Alfred to support our citizens on short notice.

Although not required for either Irene or Alfred responses, but as a further hedge against uncertainty, National Guard forces from other states can be made available under the Emergency Management Assistance Compact. Pre-negotiated arrangements under EMAC facilitate the use of National Guard forces from other states when the requesting state's National Guard forces are exhausted or when a niche capability that does not exist in the state is required. Generally, these forces can respond to the supported state between 24 to 48 hours. The requesting state is responsible for the cost of these forces.

A final hedge against uncertainty, again not required for Irene or Alfred support are active duty military forces. These forces from across the services are normally available no earlier than 72 hours after a request for support. It is important to note the requesting state will be required to pay for services from these forces as well.

At the request of FEMA and in order to shorten deployment times in the event they may be needed; an amphibious task force organized around the carrier USS Wasp was sent to the northeast after Tropical Storm Irene. Around 2,000 marines with engineering and helicopter assets were available if needed.

As stated earlier, active duty military forces may be requested in the unlikely event the host state and National Guard EMAC forces are exhausted or a niche capability not readily available within the Guard is required. An example of a niche capability is the deployment of Navy divers to the Minneapolis, Minnesota bridge collapse in AUG of 2007.

To provide perspective to the use of active duty forces in a disaster, nearly all relevant forces responding to Hurricane Katrina were National Guard EMAC forces. Active Army Lieutenant General Honore while receiving lots of press coverage maintained only a token presence and commanded few if any response forces. The bottom line is military forces beyond our own National Guard are available in the unlikely event we experience what planners call, "the most dangerous course of action" or what FEMA Administrator Craig Fugate calls the "Maximum of Maximums" worst case scenario.

3. RESPONSE:

As stated earlier, our preparations began around Friday, 28 October, when weather forecasts predicted significant impact was likely from the storm. Early response included planning, preparation and staging of equipment and an ALERT to the force.

We began to increase our command and control capability at the state level on Saturday, 29 OCT and assigned a liaison officer or LNO to the state emergency operations center when it was stood up around 2 PM. As reports of widespread protracted power outages, damage and injuries poured in, it became apparent the Guard would be needed. Headquarters staff drafted the Operations Order directing mobilization of debris clearance and power generation capabilities on Sunday, 30 OCT.

On Sunday, I directed the establishment of Joint Task Force October to command and control our response. Along with the mobilization of JTF October, a number of subordinate joint task forces were organized and mobilized.

Early in the state's response to the storm, the governor established multi-agency functional task forces. State level task forces were established to manage fuel, commodities and debris management support among others. Senior personnel from state agencies acted as task force chairs. These task forces added significant value by providing situational awareness in their areas of responsibilities, maintaining contact with the community and organizing, coordinating and monitoring the delivery of support. Agency assignments to task forces during Tropical Storm Irene remained generally consistent in Winter Storm Alfred. Skills and relationships developed during Irene paid significant dividends in task force operations during Alfred.

The Connecticut National Guard supplied senior personnel to many of the state task forces with our most significant interaction with the commodities distribution and debris management task forces. This greatly facilitated our ability to provide support in our assigned areas.

Sunday 30 October we had around 280 Guardsmen available for response. The state was still sorting out the impact of the storm and only one request for assistance from the Guard, generator support to the town of Enfield came in.

On Monday, 31 OCT, I directed our debris clearance teams under the Army National Guard's 192d Engineer Battalion, commanded by Lieutenant Colonel Craig Nowak, a state prosecutor in his civilian job, to align with the Department of Transportation. Our debris clearance teams which were initially based out of the 192d Engineer's headquarters in Stratford, partnered with CL&P crews dispatched out of the CL&P Waterbury operations center. This partnership worked well and was our main debris clearance effort until an urgent call from municipal CEOs caused us to shift our efforts to the heavily affected north central region of the state.

On Thursday, 3 Nov, we threw the entire weight of our debris clearance effort at the 4 town area of Simsbury, Farmington, Avon and West Hartford. At this point we were fielding 6 heavy debris clearance teams organized around our self deployable, wheeled, armored bucket loader called the HMEE or High Mobility Engineer Excavator. ***(FYI ONLY: We own 6 HMEE, 4 in the engineers and 2 in the MPs. We currently have 14 SEEs, the authorization of HMEEs is new and the corresponding SEEs and the 8 in excess are scheduled for turned-in)*** The HEMI is particularly suited to debris clearance since it has a claw capability that facilitates debris removal. It is self deployable with a profile not limited by most bridges in the state and is capable of speeds of up to 55 MPH. These heavy debris clearance teams included chainsaw operators and the vehicles required to support the team. In addition to the heavy teams, we also fielded 2 light debris clearance teams. These light teams served as a capability dispatched rapidly upon request to an area in advance of our heavy teams. They were fielded with limited chainsaw capability to facilitate their own mobility and for urgent or unforeseen requirements.

As the days without power mounted, we began to look for ways to better facilitate the debris clearance effort. I directed the stand up of a liaison or LNO cell with the responsibility to partner with CL&P operations centers and reach out to municipalities requesting support. This effort paid dividends as synergy developed with CL&P crews out of the Simsbury and Tolland Operations centers. At a minimum, our LNO's outreach to local officials directed by our state's emergency management personnel, served to reduce some frustration. Periodically, we were able to clarify disjointed information and synchronize local DPW, CL&P and Guard team efforts in a way that got resources moving.

The work of our Army and Air guard route clearing teams along with our LNOs continued through Sunday 6 NOV. Throughout debris clearance operations, our teams reacted to opportunities to support our citizens that developed on the ground. For example, our Air National Guard Team helped clear the grounds of the state's "Connecticut Children's Place," in East Windsor. Along the way, our teams periodically diverted their efforts to help citizens in acute need of assistance, such as elderly residents trapped by blocked driveways.

As we approached the weekend, the demand for our teams diminished however we continued to employ efforts to identify opportunities to serve. Our LNO outreach continued and we dispatched Military Police teams to drive through or recon affected areas to identify requirements. We generally continued our debris clearance efforts

along these lines until we demobilized JTF October. Along the way, we conducted 128 debris clearance missions, 31 route reconnaissance missions, 36 LNO missions and supported 17 communities and 2 state agencies. ***(DOT and Vet's)***

Demand for power generation support from the Connecticut National Guard began at the earliest stages of our deployment. The Air National Guard's 103rd Air Control Squadron's full inventory of 60 KW generators was deployed in support of Winter Storm Alfred. These generators were often deployed to a location, recovered as power was restored and then rapidly redeployed to another location. Numerous small generators located throughout Army and Air National Guard's units were also deployed. Our ability to deploy generators was agile and responsive.

Supported facilities included emergency services such as municipal EOCs, fire and police departments, schools, cell phone towers and repeater sites, sewage treatment plants, senior centers, a fish hatchery, the Rocky Hill Veteran's home and even a highway rest area. All in all we supported 11 communities and 2 state agencies, many with multiple generators.

On MON, 31 OCT, the governor directed the establishment of a commodities distribution center. The Connecticut National Guard was tasked with this mission and established a point of distribution or POD at the Pratt and Whitney runway complex in East Hartford adjacent to UCONN's Rentschler field.

Many lessons were learned from our POD operation during Tropical Storm Irene that improved operations during Winter Storm Alfred. During Irene, we set up our POD on the Rent property. A UCONN game forced us to redeploy the POD to the adjacent Pratt runway complex. This turned out to be a fortuitous event since it validated the runway complex as a more advantageous site. The excellent relationships developed with Connecticut's OPM, Rentschler Field staff and Pratt and Whitney during Irene facilitated a great synergy during Alfred that enabled our Guardsmen to better support our state's citizens.

Two significant enhancements greatly improved commodities support over Irene. The first was the deployment of a Material Management Cell or MMC to the state emergency operations center. This cell was staffed with personnel from the Guard's logistics community and our partner agency in commodities distribution, the Department of Corrections. The MMC took requests for support from the state EOC and often directly from municipalities. They conveyed these orders to JTF Tiger, facilitating accuracy and responsive and rapid load configuration for shipment to the requestor. The MMC also provided situational awareness on inventory levels to the state to help support the ordering process. This enhanced situational awareness facilitated good decisions regarding inventory levels and provided responsive feedback to anxious municipalities on the status of their orders.

The second significant enhancement was the activation of a delivery capability based on the Army National Guard's 1048th Truck Company. Sixteen flat bed tractor trailers of the 1048th were activated to deliver orders for commodities directly to municipalities. Additional guard transportation assets facilitated the delivery of smaller loads. The incorporation of the MMC and a delivery capability facilitated rapid, accurate delivery, providing enhanced situational awareness to decision makers and customers. These two enhancements were the most profound improvements in POD operations over Tropical Storm Irene.

Other improvements also paid great dividends. The Department of Corrections stood up a retail operation to serve individual customers or citizens at their facility in Cheshire. Additionally, FEMA set up an Intermediate Staging Base or ISB at the RENT adjacent to our POD operation. FEMA pushed commodities forward to the RENT at their cost remaining under their control until requested by Connecticut. This was a cost effective and responsive service provided by FEMA. Supporting logisticians accompanied FEMA to the RENT and developed a working relationship with JTF Tiger personnel providing many synergies.

We demobilized the POD and were clear of the RENT by TUES 8 NOV. The Guard delivered around 35,000 cases of water and around 36,000 cases of Meals Ready to Eat or MRE. Eighty six towns were supported with around 230 missions conducted.

In addition to the major mission areas discussed, the Guard responded to various other requirements. We delivered hundreds of blankets and cots to shelters and provided personnel to support the use of the Hartford Armory in support of the state emergency operations center. The Air National Guard even provided a heater unit to the state Veteran's Home in Rocky Hill.

On TUES 8 NOV, we began to consolidate JTF October operations, return equipment to home station armories and conduct equipment servicing actions ensuring it would be ready for the next deployment. On MON, 7 NOV, we recovered our last generator from Willington and demobilized JTF October. Overall, approximately 1,200 Guardsmen supported the state during Winter Storm Alfred with only 2 minor injuries, an illness experienced by a Guardsman while on storm duty and no significant equipment losses.

4. OUR RECOMMENDATIONS:

The interagency task force program added value. Task force assignments should remain consistent in order to capitalize on relationships and skills developed. Routine meetings and exercises involving task force personnel are necessary to keep their skills current.

Pratt and Whitney's runway complex is an excellent site for a state central POD operation. Its size, supporting road complex, and support available from Rentschler field assets and personnel greatly facilitate POD operations while avoiding conflicts with UCONN games.

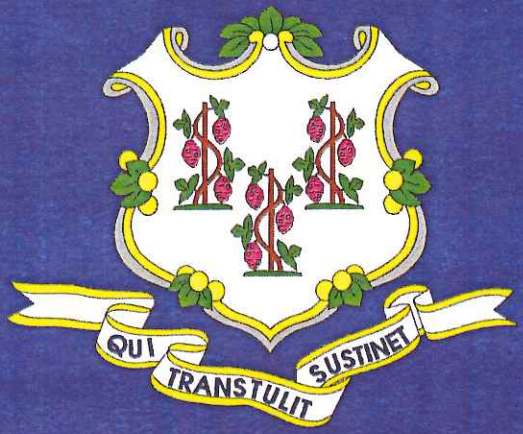
Early in the operation, efforts were made to identify satellite POD sites to facilitate regional pick up of commodities by municipalities. It proved difficult to locate sites that could support POD requirements and none were found during our efforts. Additionally, the requirement to duplicate personnel requirements and on site material handling equipment like forklifts places an additional burden on available resources.

My recommendation is to retain the central POD site, retail satellite sites and deliver commodities to the municipalities.

The Guard received a lot of publicity from our debris clearance efforts during Winter Storm Alfred. However, it is important to note the Connecticut Guard possesses a relatively small number of debris clearance assets. At our peak, we deployed around 10 teams. With additional equipment assets and trained chain saw personnel, we could stretch to possibly 20 teams. Against the backdrop of a catastrophic event like Winter Storm Alfred, this is a minimal capability. When considering debris removal for catastrophic disasters, the utility companies in conjunction with the state will need to rely on capabilities other than the Guard.

And with that, I want to thank you for this opportunity to testify before you today and look forward to any questions you may have.

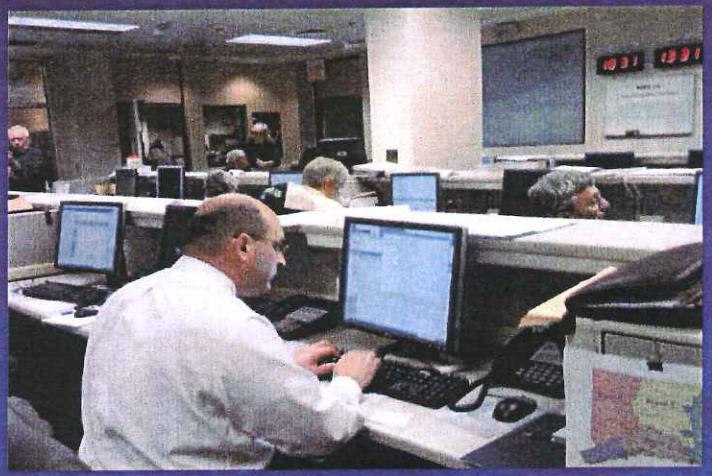
STATEWIDE FIRE- RESCUE DISASTER RESPONSE PLAN



The Connecticut Chiefs Association in cooperation with the Commission on Fire Prevention and Control

Statewide Fire-Rescue Disaster Response Plan

ESF 4



Statewide Fire-Rescue Disaster Response Plan

- The purpose of the Statewide Emergency Response Plan is to provide for the systematic mobilization, deployment, organization, and management of Fire-Rescue resources throughout the State, and the Nation, in assisting local agencies in remediation of the effects of a disaster.
- No other emergency response group that can move a as significant an amount of personnel and equipment in as quickly as the Fire Service.

Connecticut Plan History

- *1999 – Original group formed by Connecticut Chiefs Assoc.- begins work on Draft Plan*
- *Original Plan approved in 2002 using State of Florida Plan as a Model.*
- *On December 2010 the most recent major revision was signed and approved.*
- *Operates with Coordinators in 8 Counties and 5 Regions.*
- *Most Activated of State Emergency Plans*

Connecticut Plan Training

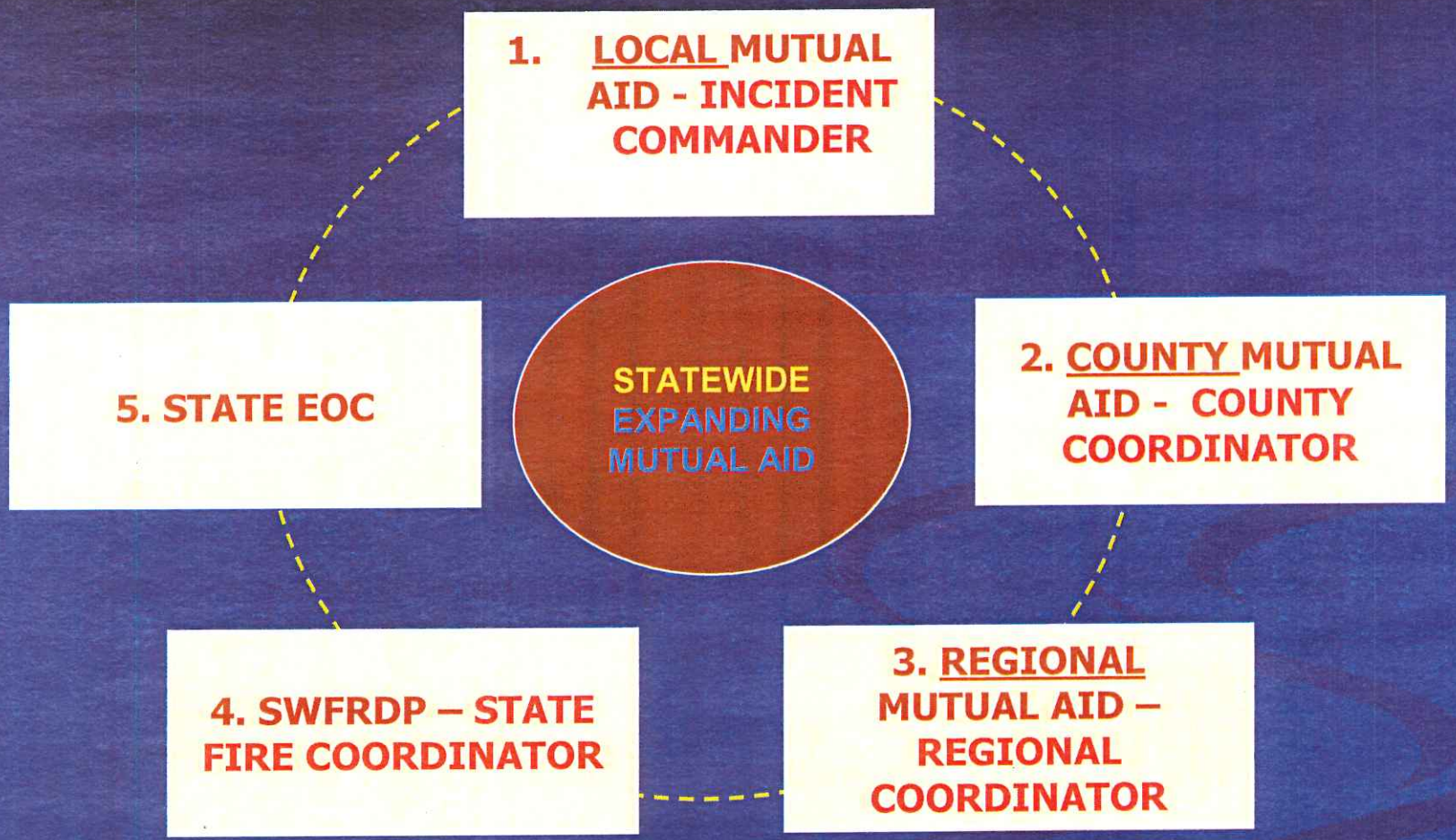
- 20 Minute presentation for Fire Departments, associations and organizations.
- 4 hour training program for Fire Officers.
- Regional and County exercises.
- WEBeoc training for Fire Coordinators.
- DEMHS – All Hazards training
- Monthly meetings

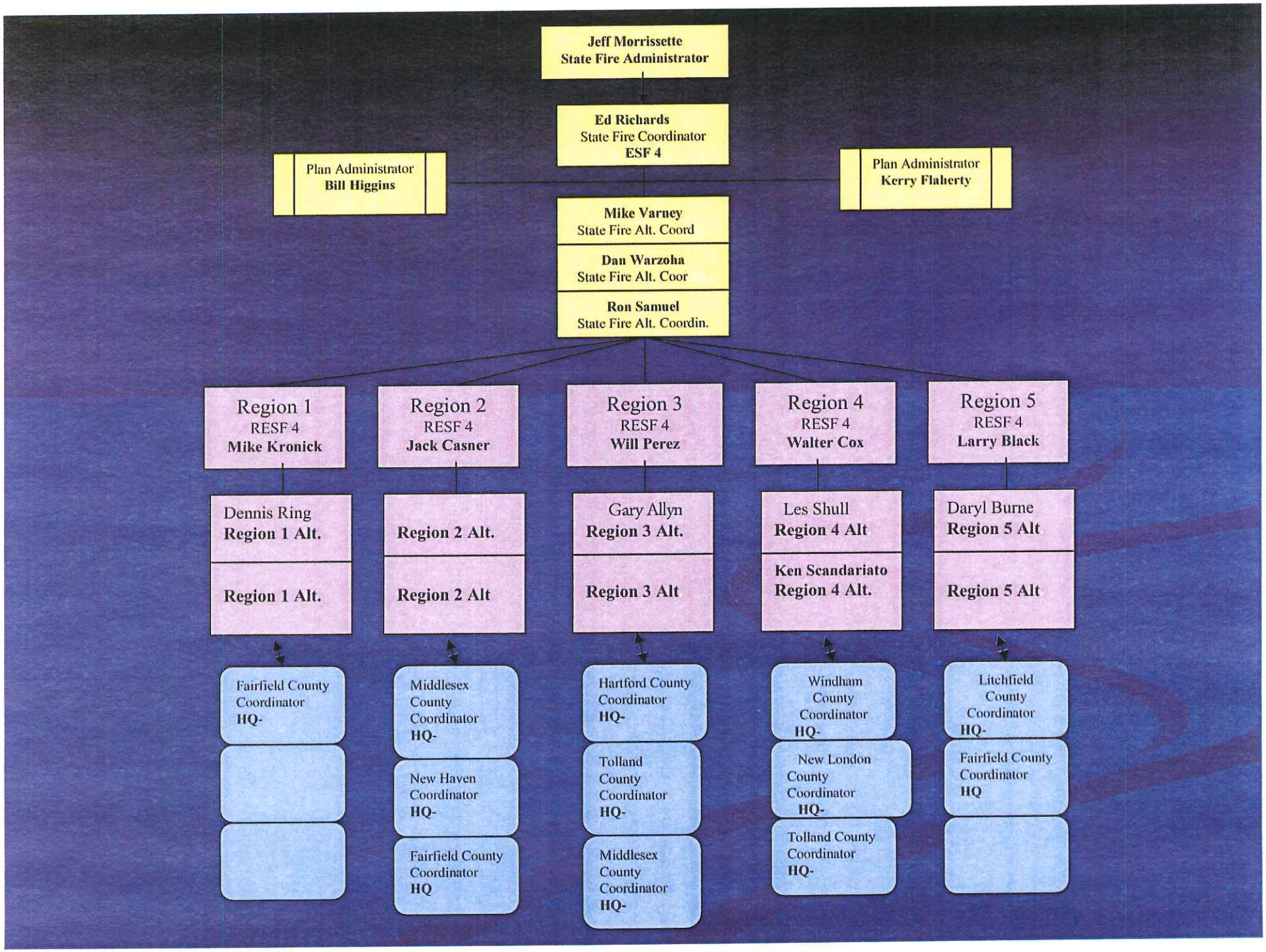
Model Procedures Documents that support the State Fire Service

- Model Procedures for Response of Emergency Vehicles During Hurricanes and Tropical Storms
- Model Procedures for Response to Collapse or Potential Collapse of Buildings

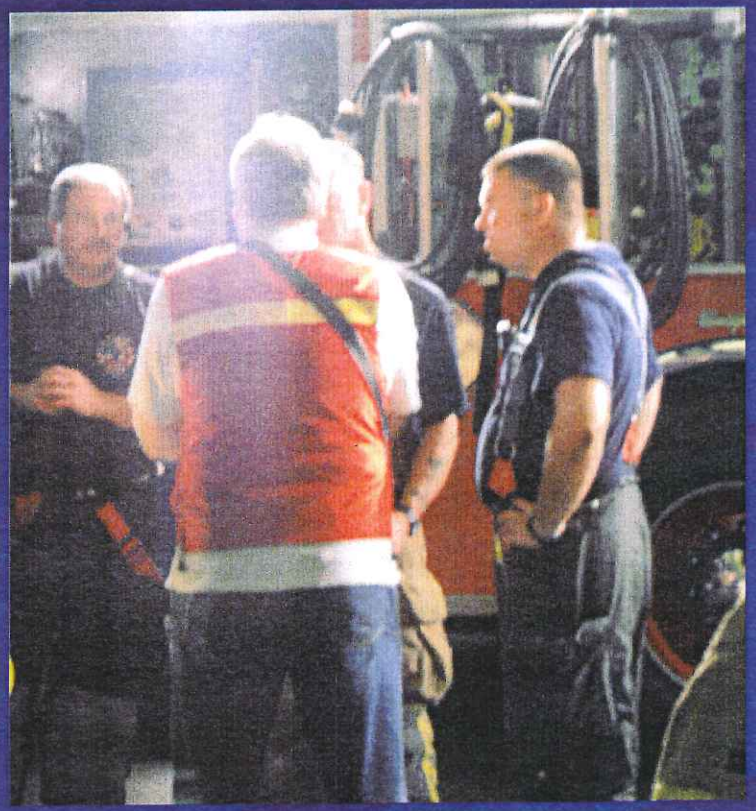
ACTIVATE

REQUEST FOR ACTIVATION / NOTIFICATION

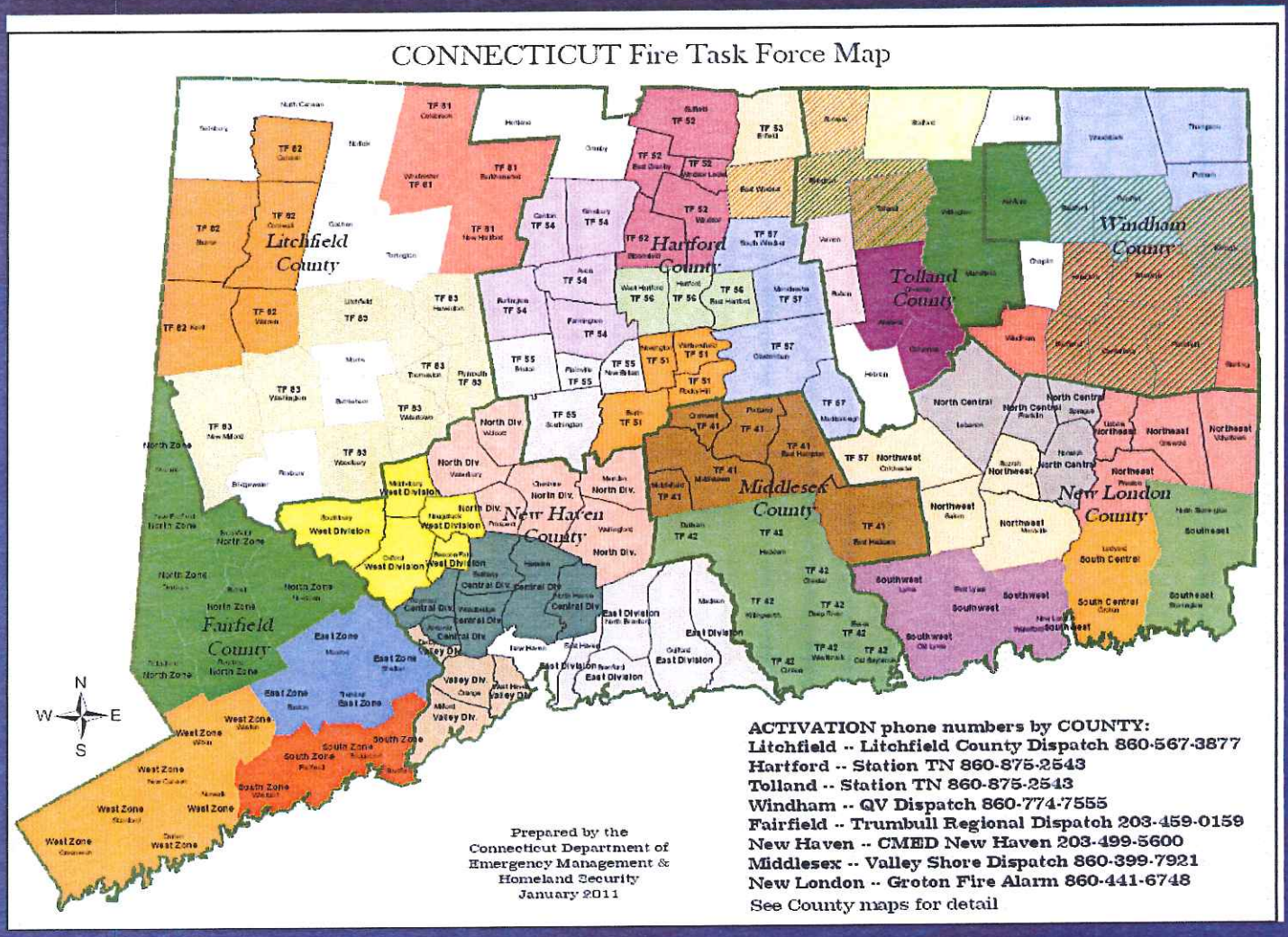



Jeff Morrissette
State Fire Administrator
Ed Richards
State Fire Coordinator
ESF 4
Plan Administrator
Bill Higgins
Plan Administrator
Kerry Flaherty
Mike Varney
State Fire Alt. Coord
Dan Warzoha
State Fire Alt. Coor
Ron Samuel
State Fire Alt. Coordin.
Region 1
RESF 4
Mike Kronick
Region 2
RESF 4
Jack Casner
Region 3
RESF 4
Will Perez
Region 4
RESF 4
Walter Cox
Region 5
RESF 4
Larry Black
Dennis Ring
Region 1 Alt.
Region 1 Alt.
Region 2 Alt.
Region 2 Alt
Gary Allyn
Region 3 Alt.
Region 3 Alt
Les Shull
Region 4 Alt
Ken Scandariato
Region 4 Alt.
Daryl Burne
Region 5 Alt
Region 5 Alt
Fairfield County Coordinator HQ-
Middlesex County Coordinator HQ-
New Haven Coordinator HQ-
Fairfield County Coordinator HQ
Hartford County Coordinator HQ-
Tolland County Coordinator HQ-
Middlesex County Coordinator HQ-
Windham County Coordinator HQ-
New London County Coordinator HQ-
Tolland County Coordinator HQ-
Litchfield County Coordinator HQ-
Fairfield County Coordinator HQ

All Regional and County Fire Coordinators are Career or Volunteer Fire Officers who volunteer their services

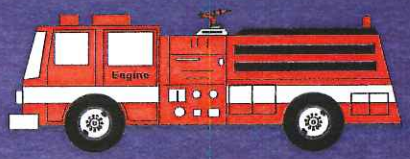


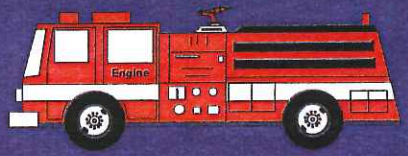
CT State Task Force Map System

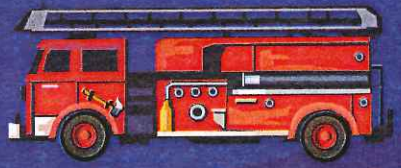


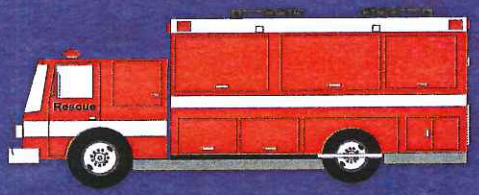
TASK FORCES

Each unit responds with 4 personnel (minimum)

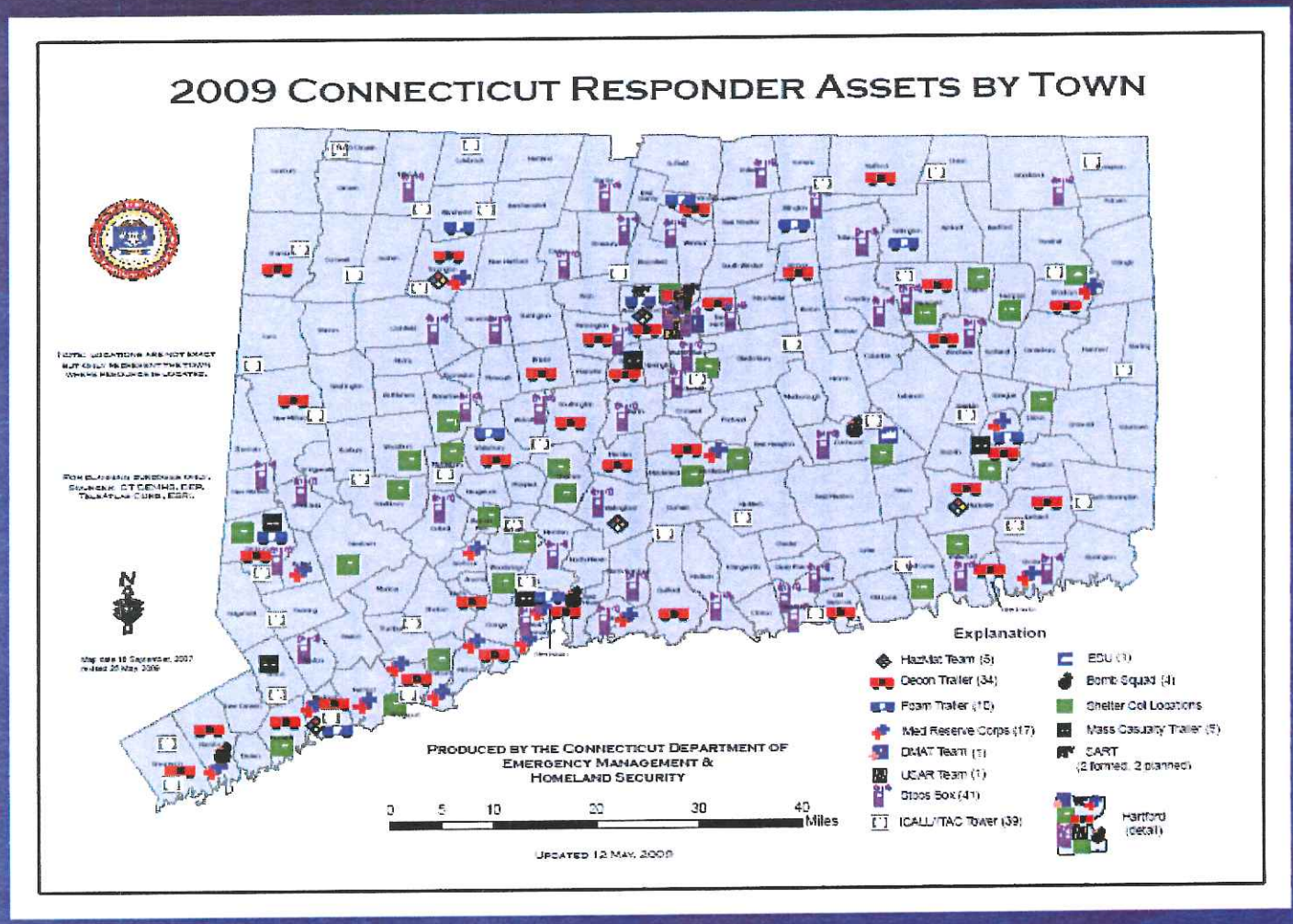








Connecticut State Assets



Assets operated and maintained by Fire Departments

- Foam Trailers (8)
- Decontamination Trailers (30)
- STOCS Radio systems
- Regional Haz–Mat teams (5)
- Communication vehicles

Connecticut Regional Assets

CT Statewide Radio Systems

- *STOCS Radio System*

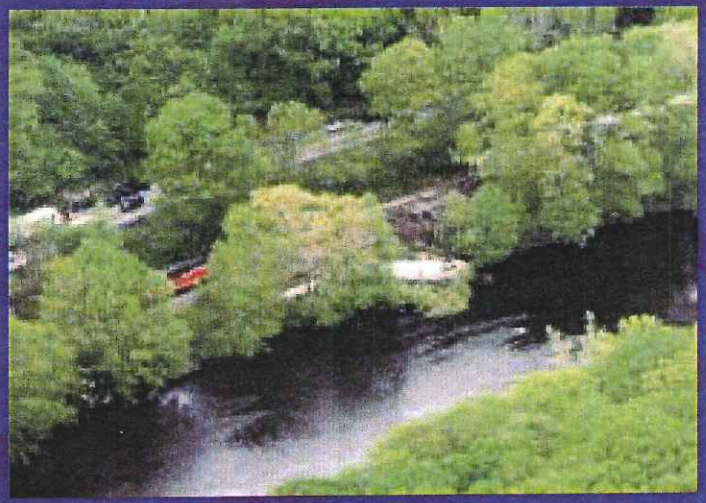
ICALL / ITAC

Large Incident Activations

- Large scale fires
- Lost Person Searches
- Large brush/forest fires
- Train derailments
- Flooding events
- Extreme Winter weather events
- Tornados
- Hazardous Material Incidents

Large Incident Activations

Colchester *Middletown* *Lisbon* *Windsor Locks*



STATE OF CONNECTICUT

DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION

Testimony of Jeffrey J. Morrissette, State Fire Administrator

The Two Storm Panel
Special Meeting
Friday, December 2, 2011

Good afternoon Co-Chairs McGee and Skiff along with members of Governor Malloy's Two Storm Panel. Thank you for the opportunity to appear before you.

My name is Jeffrey Morrissette I serve as the State Fire Administrator for the Commission on Fire Prevention and Control a Division within the newly created Department of Emergency Services and Public Protection. I am joined by Chief Edward Richards of the Enfield Fire Department and William Higgins, a part-time employee of our agency, both who work very closely with me in managing the Statewide Fire Rescue Disaster Response Plan.

As a point of reference, the Commission is an internationally accredited institution that serves as the focal point for Connecticut's fire service within state government. Our primary mission is training, education and certification of the nearly 30,000 career and volunteer fire service personnel throughout Connecticut. Our Training arm operates the Connecticut Fire Academy located in Windsor Locks. Daily, we collaborate and work closely with fire chiefs, local fire department training officers and Regional Fire School Directors to coordinate fire service training statewide without duplication of effort. In addition, a statutory responsibility of my position as State Fire Administrator is to assist fire departments in the coordination of mutual aid.

It is our intent this afternoon to provide you with an overview of the Statewide Fire Rescue Disaster Response Plan, our role in the State Emergency Operations Center and to provide lessons learned and recommendations. We recognize a number of fire chiefs had previously appeared before you providing observations so we hope to minimize any duplication.

While formal and informal mutual aid agreements have existed between fire department's for many decades, the State Fire Rescue Disaster Response plan is a tool to enhance and formalize these activities especially for larger events, natural or man-made, necessitating intra- or inter-state resources.

The Commission has been a close partner and active player within the State Emergency Operations Center since around 1999. At that time we worked with the Military Department and it's Office of Emergency Management gaining a Fire Liaison [Emergency Support Function 4

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(ESF-4)] seat at the State Emergency Operations Center (SEOC). In fact, outside of some exercises, our first deployments to the SEOC were for Y2K and September 11, 2001.

Since that time our value as a resource within the SEOC has been recognized and the fire service through the Commission is regularly represented during activations. With the recent consolidation of the Division of Emergency Management and Homeland Security and Fire Commission as Division's within the Department of Emergency Services and Public Protection it has afforded a greater opportunity for our two operations, each with similar values, to work together. In fact, for the recent Two Storms, I have had an opportunity to serve in a variety of Command and General Staff roles at the SEOC including Safety Officer, Deputy Operations Section Chief and Multi-Agency Coordinator (MAC) during the evening shifts.

At this time Chief Edwards and Mr. Higgins will provide an overview of the Statewide Fire Rescue Disaster Response Plan to be followed by observations, lessons learned and recommendations. I would be remiss not to recognize the members of the Statewide Fire Plan; the State, Regional and County Fire Coordinators who volunteer their services to the State of Connecticut. Their assistance and input has been of great value.

Observations, Lessons Learned and Recommendations

- ESF-4 Fire Liaison staffing resources need to be increased especially for long duration activations. We will initiate the recruitment and training of Fire Commission staff and others to serve as Fire Liaisons.

- Continue WebEOC training for Fire Plan personnel. Others testifying identified possible enhancements to WebEOC to make it more functional and robust.

- During the severe winter storm numerous fire departments reported their personnel had been working 3-4 days with minimal rest. Many departments also reported responding to more than 50% of their annual response average in this 3-4 day period. Volunteer fire departments are often times staffed with local public works personnel thereby causing competing demands for resources. Departments need to plan for long duration events to ensure safe operations. In addition, the State Fire Plan may be utilized to move up resources from areas of the state less impacted to provide adequate rest, rehabilitation and equipment repairs.

- Requested and received the activation and mobilization of ***Go Team*** resources from the International Association of Fire Chiefs for both Hurricane/TS Irene and the severe Winter Storm. A total of five fire chiefs from throughout the United States with extensive large scale disaster experience traveled to Connecticut to assist both in staffing the Fire Desk as well as providing assistance to DEMHS staff tasked with planning, logistics and operations. This free resource has proven itself and we will continue to exploit this resource.

- For Hurricane/TS Irene, the state proactively leased large capacity pumps for local fire department or public works agency use. In addition, a number of small portable pumps were purchased and are now available as a local resource through DEMHS. Proactively securing and staging these resources should be repeated for similar type events.

- Continue a strong focus upon training and exercising. This should include the National Incident Management System (NIMS). It is proven, the more state, regional and local emergency management and response personnel train and exercise together the better our response to real life incidents will be. Invest in training and exercising resources currently in place; do not look to create new or competing entities. When trainers and exercisers from either the Commission or DEMHS are not training and exercising they are highly trained individuals that could be used in the SEOC during activations and in the field, post storm, working on damage assessments, as well as public and individual assistance efforts.

  Facilitate training and distribution of a new DVD (copies provided) on CL&P's Priority Response 1/2/3 System to all first responders. This communications and response system was developed as a collaborative project between CL&P and the emergency service community (within the CL&P distribution area) as a result of the electrocution death of Somers Firefighter Craig Arnone, in December, 1996. The DVD which was completed late this summer is the first major update to the program since first released in the late 1990's.

- Expand exercise activities as it relates to fire service Task Force and Strike Team deployments. Fire service resources were deployed during Irene to assist with a large scale evacuation of residents of a low lying area of Bridgeport, as well as a Task Force assisting with the deployment of sleeping cots at Bradley International Airport for stranded airline passengers during the recent winter storm.

- Continue to support a close alliance between the Division of Emergency Management and Homeland Security and the Fire Commission as well as many other partner agencies and Divisions that share common values of service to our citizens in time of need.

- Numerous state assets/resources such as Decontamination Trailers, Foam Trailers, STOCS Boxes, Haz-Mat Teams, etc. are managed by fire departments. We need to initiate an inspection of these assets, many of which are becoming dated to ensure their operational readiness. Also, for large scale events, the departments that are expected to respond with these resources have found themselves to be overtaxed.

- Litchfield County Fire Chiefs Emergency Plan reported that local and state public works crews were quick to open many streets, but where potentially live wires were entangled in trees, the power company needed to provide "make safe" crews to confirm those lines were dead before their personnel could clear the remaining streets. While this issue was continually identified as a priority in many of the communities to the CL&P Liaison, CL&P crews were observed working on other projects first. Priorities established in local EOC's in conjunction with the CL&P Liaison seemed never to make it to the line crews.

With the loss of power, much of the phone service ultimately failed. Many cell towers had no on-site emergency power available. AT&T "flash" stations and cable relay boxes were not provided with emergency power generators for many days. Battery back-up was inadequate for the length of the outages.

Citizens must have the ability to call for emergency services, and a usable "reverse 911" or emergency notification system during wide spread nature disaster is equally important to keep the public informed. Cell towers need on-site emergency power generation or telecommunications companies must be capable to provide portable emergency power at every location before the batteries fail.

- Situational awareness at the State EOC is dependent upon the information gathered through numerous resources. At times "group think" could develop based upon incomplete and delayed information and situation reports that are more favorable than what is actually occurring in the field. From the Fire Liaison side, we will enhance training and education to the fire service and fire coordinators to improve on situational reports and needs in a more timely fashion.

- Continue proactive public safety messaging from the SEOC. The fire desk has had a good rapport with the Public Information Officers from the Governor's Office, DEMHS and other agencies allowing timely press releases on a variety of safety issues such as Carbon Monoxide, Chain Saw Safety, Alternative Heating Devices, etc.

Thank you again for the opportunity to present before you. We are very proud of Connecticut's fire service, its an honor to serve them. They provide exceptional services to the citizens of our state. We are happy to respond to any questions you may have.

Government Affairs
State Public Policy
Industry Information

Partnerships
Trade Services
Retailer Services

Connecticut Food Association

Two Storm Committee
Testimony by Stan Sorkin, President
Connecticut Food Association
Friday, December 2, 2011

I am Stan Sorkin, President of the Connecticut Food Association. Thank you very much for the opportunity to address this committee to review the effects of the two storms on Connecticut's neighborhood grocers and discuss ways to improve the situation.

The Connecticut Food Association is the state trade association that conducts programs in public affairs, food safety, research, education and industry relations on behalf of its 240 member companies—food retailers, wholesalers, distributors, and service providers in the state of Connecticut. CFA's members in Connecticut operate approximately 300 retail food stores and 250 pharmacies. Their combined estimated annual sales volume of $5.7 billion represents 75% of all retail food store sales in Connecticut. CFA's retail membership is composed of independent supermarkets, regional firms, and large multi-store chains employing over 30,000 associates. CFA's 90 associate members include the supplier partners of its retail and wholesale members. Our mission is to foster the growth of the food industry in the state of Connecticut, by proactively initiating new laws, regulations and interfaces that benefit the industry and defending the industry against detrimental regulations and laws negatively affecting members. Our goal is to create a growth oriented economic climate that makes Connecticut more competitive with surrounding states.

As you can imagine, the storm had a major effect on the food industry with store closures, lost retail sales, and lost product being destroyed for food safety. CL&P's performance did little to create an economic climate which would make Connecticut more competitive with surrounding states.

First, we are gratified that Governor Malloy, personally, and his administration after Tropical Storm Irene have recognized the "first responder" role that the grocery industry plays in times of weather related disasters, especially accompanied by major power outages. As such, the administration emphasized that grocery stores should be a priority for power restoration and road access. We question if CL&P heard this message.

The neighborhood grocery store is the prime source of food supply pre and post storm. When the power goes out for a period of time, households are forced to throw out perishable products. When power is restored to their homes, they immediately run to the store to replenish their refrigerators and freezers. Stores must be up and running to meet this demand.

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Timely and accurate communication must occur at the state and local levels. At the Governor's request, we have written a letter to have a seat at the table at the emergency operations center to gain access to the most up to date information, such as road closures and power restoration progress, so we can communicate it to our members on a timely basis. My counterparts in NJ and NY have such a seat. We need to close the loop on this request and formalize the food industry's involvement in the emergency management process.

Communications: Let's take a closer look at some of the other communications aspects.

On the positive side:

We are on the state's weather alert update system which allows us to communicate the latest weather reports to our members so they can react accordingly in terms of product supply chain steps and store staffing needs.

The governor's office assigned a specific person, Frank Greene of DCP, to be our industry's contact. He provided a list of key contact numbers both on the state and local levels. He requested and we were able to communicate a status report of open fully, operating on generator only, and stores without power which he communicated to the State Emergency Operations Center and then to CL&P.

On the negative side:

After reporting the information to a central contact point, we were told that the effected stores had to, in addition, contact their local Emergency Operations Center. Why do we need to duplicate communication?

Not all local Emergency Operations Centers had grocery stores on their priority list for power restoration. This needs to be reviewed and rectified.

CL&P's accuracy regarding estimated time of power restoration left much to be desired. Their website information was not specific enough to be useful or just plain wrong. Stores take different steps to protect product based on estimated time of power outages. Does a short term solution become a wasted expense if power does not get restored as initially indicated? In addition, miss-information can lead to supply chain distribution problems. Stores order product from their distributors with a 24 hour lead time based on the estimated time of restoration. If erroneous, this product can sit at a distributor trying up a refrigerated truck until it can actually be shipped.

Road Conditions: Knowledge of the current state of Connecticut's open and closed roads is extremely important in the food distribution process. We need to get food products or dry ice into stores as soon as possible based on road conditions. We are concerned about our driver's safety. Is real-time road closure information available on- line? Based on lead times, can we get advanced notice of projected road closures?

Financial Implications: As a result of CL&P failure during the two storms to restore power on a timely basis, the industry was negatively affected financially and will continue to be negatively affected.

Product Loss: For food safety reasons, stores had to destroy perishable products. Based on typical insurance coverage, only 30% of the cost of the lost product is reimbursed. Geissler's Supermarkets , which had 5 of its 7 stores down for extended periods during the most recent storm, lost $850,000 in product of which only $255,000 was covered by insurance. Stores that self-insure for a specific sum suffered a total loss of the value of lost product up to the threshold amount. To make matters worse, **based on the experience factor caused by CL&P's poor power restoration performance on back to back storms; insurance premiums on future product loss policies will be dramatically higher.**

Incremental Expenses: In addition to product loss, operators experienced increased maintenance costs for repairs and the operation of generators and payroll to protect product. In the case of Stop & Shop, during hurricane Irene, these categories were $1,000,000 in the 24 effected stores. What state programs are in effect to incentivize the purchase of generators? Business Interruption Insurance: Policies differ by company. For example, a policy will not cover the first 48 of business closure and then reimburse only 30% of average sales causing a financial loss to a store operator. Will the $30 million fund established by CL&P be available to the affected business to offset the loss?

Lost Wages: Part-time store employees were not needed during a store's downtime and thus they were without income during the length of a store's closure.

Emergency SNAP (Food Stamp) Benefits: The Department of Social Services should be congratulated for its work in securing incremental emergency SNAP benefits for Connecticut's recipients and helping them replace destroyed foodstuffs during these two storms and working with the industry to insure the demand for extra product availability and store staffing are met. CFA has met with Deputy Commissioner Claudette Beaulieu, reviewed the role of a grocery store in the SNAP program and established a communication process so stores are informed of incremental SNAP funds being released.

In conclusion, we look forward to working with the administration in addressing the issues we raised today. Connecticut's grocery industry must be part of the emergency management process. Our goal is to better serve the residents of Connecticut by being open for business as soon as possible after a weather related problem. With the realization that the grocery store is the heart of a community, a true first responder, and timely communication, we can achieve this goal.