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STATE OF CONNECTICUT
GOVERNOR DANIEL P. MALLOY

The Two Storm Panel
Special Meeting
Tuesday, November 15, 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, Robert McGrath, and Cathy Osten

Members Absent: None

1. **Call to Order:** Major General James Skiff called meeting to order at 9:33 a.m.
2. **ISO New England: Transmission Outages during the October Snow Storm:** Joe McGee presented a statement on behalf of ISO New England to the Panel. The statement is ISO New England's analysis of the outages of the October Snow Storm in comparison to Irene (see attachment A).
3. **Investor Owned Utilities: Lessons Learned from Storm Irene and the October Snow Storm, and Recommendations:**

a. UIL Holdings, James P. Torgeson, President/CEO: James P. Torgeson introduced the UIL Holdings Team present at the meeting. James Torgeson told the Panel that UIL Holdings have sent a RFI to industry technology and consulting firms in order to get feedback regarding technology and processes that may facilitate UI during future storms. This information may help UI accomplish goals of improving communication to towns and customers.

Joe McGee requested that UIL share information received with the Panel.

The UIL team said they would be happy to forward this information to the Panel.

The UIL team gave the presentation to the Panel (see attachment B).

Joe McGee asked the members of the Panel if they had any questions on the UIL presentation.

Scott Jackson said that Hamden is largely in the UI service territory. He said that the differences in communication between Irene and the October Snow Storm were stark. He was encouraged by the RFI. He questioned UI about the managing of the October Storm. He noted that the initial expectation for restoration was forty-eight hours, but power was not restored until seventy-hours later. He asked, in terms of managing, if it was a lack of assessment, or the rolling outages.

The UIL team noted that they were close to meeting their goal, but due to the impact of the rolling outages they were unable to meet their projected goals. The team said that UI tried to give the best estimate at the time, but admitted that they should have provided updates sooner. That was an issue they need to address. The day after the October storm was mild, which lead to rapidly melting snow and the snapping back of the trees, which caused additional outages.

Joe McGee said he was trying to understand the relationship between the electric utilities and the telecommunications company in terms of pole ownership and maintenance.

The UIL team said that the ownership is roughly 60/40 (utility/telecoms). The coordination to change poles that come down is very important. Once the pole is replaced, various utilities need to shift the wires from the old pole to the new pole. During Irene they contacted AT&T at UI's ops center and coordinated well. The team said that moving forward this was a best practice that should be utilized.

Joe McGee asked if UI has a tree trimming budget required by DPUC. UI responded that they did have a budget. Joe McGee questioned whether there is an agreement between UI and AT&T in regards to tree trimming responsibilities.

The UIL team said that regardless of ownership of the poles, UI does the tree trimming among the trim zone required on all 3,000 miles of the distribution lines. Trees that needed to be trimmed around the telecommunication wires are the telecommunication company's responsibility. UI does the trimming regardless.

Joe McGee inquired about the ability of a pole to maintain itself in a windstorm. He understood from previous testimony that poles can withstand 50 mph winds. He asked about the effects of adding additional wires to the poles and whether the calculations differ for what the poles could withstand with the additional wires. Joe McGee asked who sets the standards for how much can be attached to a pole.

The UIL team responded that there is an engineering team that looks at the attachments to make sure they are secured properly to the poles. They did not believe that anyone had done a comprehensive analysis on what a pole could withstand based on the entire load of attachments. The team said that this was a valid question, as with high winds there can be a sail effect due to the attachments. There needs to be coordination from an analytical perspective to address strengthening the poles and the affects of the attachments.

Joe McGee explained that the issue of how the poles are loaded is a critical one. This issue was dealt with in University of Florida where machines were used to simulate various wind conditions. He noted that it is unclear in Connecticut who is responsible for setting the standard for pole strength.

The UIL team agreed that better collaboration from an analytical and design and capability of poles is needed. They could not recall a pole or wires coming down due to high winds. They stated that poles came down due to trees and limbs falling on either the poles or the wires.

Major General James Skiff said that UI has some work to do with other utilities, but the goal to enhance technology is a worthy goal in terms of these discussions.

Joe McGee said that in looking at the state's disaster plan, it is based on a CAT 3 hurricane. He noted that the Panel is unaware of any institution that could actually withstand a CAT 3 hurricane effectively. He asked what UI is preparing for in terms of standards. Somewhere between 200-300 million will be spent on rebuilding an infrastructure that just fell down using the same standard we had when it fell down. With 120 mph winds, and in hardening the system, Joe McGee asked what the response of the utility is to the fact that their system is vulnerable to high winds. He noted that by looking at the vulnerability of the infrastructure, we need to examine what needs to be done in order to migrate to a better system.

The UIL team responded that they need to look to better tree management. The Panel's point was well taken. They agreed that if all of the trees are removed, yet the system is still unable to withstand high winds, then this issues needs to be addressed. He suggested that perhaps they should have more poles, or tie them down with guide wires, or do more undergrounding. There needs to be a comprehensive engineering look at how to strengthen the poles. Still, the issue of better tree management needs to be addressed.

Cathy Osten asked what percentage of the infrastructure is underground.

The UIL team said that on the distribution side it is very little; less than 10%.

Cathy Osten asked if there are any new subdivisions that are all underground.

The UIL team said yes at the customer locations there are many cases where the lines that feed the homes are underground. They also said that the lines coming to that location are overhead.

Cathy Osten asked who is responsible for maintaining and repairing the undergrounding if there was a malfunction.

The UIL team said it depends. The developer is responsible for putting in the trenching and the conduit and UI supplies the cable and makes the connections. If it is a cable failure then UI would be responsible for repair. If it is a duct failure then the developer would be responsible for the repair, but UI may facilitate the repair.

Cathy Osten asked whether a certain standard is followed to ensure there is the proper conduit.

The UIL team said that UI specifies what the proper requirements are and whoever is involved needs to adhere to standards.

Cathy Osten asked if during Irene, flooding occurred in areas where UI had underground wires.

The UIL team said not to their knowledge.

The UIL team made a correction as to the percentage of wires underground. Approximately 19% of the distribution system is underground.

Joe McGee asked what percentage of the transmission system is underground.

The UIL team said roughly 24% of the transmission lines are underground.

Joe McGee asked that in the past two storms, in terms of outages or interruptions what was the ratio of overhead versus underground.

The UIL team did not believe there were any failures to the underground systems in either storm.

Lee Hoffman asked if UI would be looking at tree trimming procedures for transmission lines in addition to the distribution lines as he had heard that there were a large number of transmission line/tree contacts.

The UIL team said that they are constantly looking at tree trimming for the transmission system. They said that they did not lose any of the transmission lines during the October snowstorm. There

are improvements to be made though, as some of the trees, even though they were outside of the right-of-way, on private land, they were tall enough to go over the transmission system.

Lee Hoffman referenced slide 7 and asked when UI began asking for mutual assistance for the October snowstorm.

The UIL team said they started asking on Saturday. The team further noted that mutual assistance is not a precautionary measure. It is designed to provide you with resources when there is actual damage. Utilities are hesitant to ask for crews unless the event is imminent or actual damage was sustained.

Lee Hoffman asked what the precautionary measure is if it is not mutual assistance.

The UIL team said that contractors are the precautionary measure. It is important to hire as many contractors ahead of time as the situation may require.

Lee Hoffman asked when UI started calling for contractors.

The UIL team said they called for contractors on Sunday for the October snowstorm. For Irene, they started calling several days in advance, but no contractors were available.

Joe McGee said that one of the issues facing this panel is examining the standards. He asked what happens when UI fails to meet its own standards. He asked what the accountability is for not meeting standards. Joe McGee noted that Massachusetts has implemented a \$10 million penalty if power has not been restored within a certain time frame. He asked if senior management should be held accountable.

The UIL team said that to the extent that the standards are reasonable and can be met, then they should be held accountable. The standards have to be reasonable and not based on desirability. Customers have to understand what can be done from an engineering stand point.

Joe McGee noted that the \$10 million fine in Massachusetts likely motivates management. This law obviously impacts utilities to spend more up front to prepare.

The UIL team said they have no problem spending up front, but costs are prudent and will need to be recovered. The team said that if there is a law in this state that implements a fine if reasonable standards are not met, then UI will look at all of the options and determine whether it makes sense to acquire more resources. The team noted that it understands that they are held accountable for costs and electric rates. A precursor would be to decide what makes sense to do and determine whether people are willing to pay. For example, instead of requiring crews to drive from long distances, extra bucket trucks could be available. With the availability of extra trucks, workers could be flown in and would be available to work sooner. The teams asked whether people are willing to pay for that preparation. They noted that if so, this would be a good solution.

Scott Jackson asked what the recovery costs were for UI.

The UIL team said it was about \$20 million for Irene and about \$4 million for Alfred.

Scott Jackson noted that in the last quarter UI spent about \$25 million for recovery efforts.

The UIL team stated that estimate was correct.

Joe McGee noted that he checked with the National Weather Service and there are no official names for winter storms. "Alfred" was a name created by local media.

b. Northeast Utilities, William Quinlan, VP, Customer Solutions, CL&P: William Quinlan introduced his team. He presented to the members of the panel (see attachment C).

Joe McGee asked about the deadline for the Davies Consulting report.

The team said the review will be available in relatively short order.

Joe McGee asked that the information obtained by the Davies Consulting report be provided to the Panel.

The team said they would submit the results to the Panel.

The team continued to give its presentation to the Panel.

Terry Edelstein referred to the slide on page 20. She said that there was no reference to communications directly to the customer. She noted it was a challenge in both storms to understand when power would be restored. She said she would be interested in hearing more about those communication systems.

The team said they would be happy to share that additional information at a subsequent hearing. The utility industry challenges with communications to customers are nationwide. The team said they tend to look at things from a macro perspective. When coming up with estimates for restoration, they start with an area or geographic location. The team agreed that customers deserve earlier communication. The team noted that they hope to understand with the Davies report, what the industry best practices are, in order to get down to the desired level of communication. They are committed to doing better in this area going forward, as it is a challenge when dealing with a restoration project of this magnitude.

Cathy Osten said that she believed the team said they would contact medically protected customers. She asked about the criteria for determining which customers are medically protected.

The team said that in their system they have identified those customers. They have two categories: life threatening conditions and serious medical ailments. Both of those groups are populated into their system and protected from disconnect for nonpayment. They use that information in a storm scenario for which they should target those communications.

Cathy asked what the timeframe is in terms of medically protected customers and if it changes as a result of each storm. The team said yes, they do and the communications were generic in nature.

The team said they warned those customers of the storm and informed them they should expect outages in excess of seven days and said they should plan accordingly. As the event unfolded they had other communications targeted to that customer base as they learned more about the damage they were dealing with and the crews they had available to restore power.

Cathy asked if when they are talking to these groups of people, how they reached out to them. She asked if it was just via telephone.

The team said that yes, it can be a live call or through a recorded call.

Cathy asked if they have looked at other ways to communicate to people if phone lines are down. Perhaps information could be shared with municipalities so that someone may be sent to check on these customers. She noted in the October snowstorm, the outages were more comprehensive.

The team said it was a good point. As in Irene when phones were down, they needed to look at more conventional approaches. The team agreed that sharing that information with municipalities is a good idea. They noted that they now communicate a lot through the web and social media, but in Irene those options were not available. In Irene, there was a good example of the use of alternate communication in Branford. The First Selectman used the Boy Scouts to deliver news to hardship customers. The team said that a collaborative approach is important and should be looked at while not violating any HIPPA protections.

Cathy asked if they were identifying those who were seniors as in the October storm. She noted that it seemed that population was generally more affected by loss of heat.

The team said that they did not think they had specific information relative to age, but they would look into it.

Major General James said that in previous hearings it was asserted that at four times of their local crews they were exceeding the limits of management of their crews. He said that this team went to ten times their local crews and asked how they managed this.

The team said that for Irene it was 6 times, and for the October snowstorm it was 10 times. They said that they used every available resource to manage those crews from the outside. They have taken the more senior line mechanics and broken them off with their own managers to direct crews as they have the knowledge to do so. The team noted that every available resource was used to respond to the storms. They had chiefs manage crews and they are looking to expand on this in the future. The team noted after helping with 6 out of 7 hurricanes in Florida, they learned a lot. They noted when you scale up crews there needs to be preexisting staging areas where fifty vehicles may park. The team said they were forced to use busing, which introduced inefficiencies. They filled up the hotels in Connecticut and many in Massachusetts and it did stretch them. Halloween was very scary with wires down. They sent out 500 wire guards to guard wires that they knew about. Overall every aspect of this was scaled up. From a materials perspective they had adequate resources from across the country. There was no limitation on that, just with the specifics in directing the crews in the field.

Major General James Skiff said that his point was that maybe there are some diminishing returns after awhile if you don't have the operating oversight or management. He also noted that many towns cancelled Halloween.

Joe McGee asked how many of the poles are owned by them and by others.

The team said in CL&P territory the poles are jointly owned. For about 50% of the poles, they are the custodian and must take care of these poles. For the other 50% the phone company does the same. There are 700,000 poles on the system that are split.

Joe McGee asked if they maintain the trimming on all 700,000 poles or are they responsible for half.

The team said that they do all 700,000. It is not an arrangement with AT&T, but rather that they are concerned about keeping trees out of their wires and AT&T is not, so AT&T does not do the trimming.

Joe McGee asked what their responsibility of maintenance is in terms of the poles.

The team said the pole itself.

Joe McGee asked who is responsible for determining what can be attached and what is the effective strength of the pole.

The team said that the 40mph is with ice loading. With no ice on the pole, it can withstand winds of 60mph or more. The 40mph is with 1/2 inch of ice. In a large part of the country subject to ice storms, that is a severe criterion. Both the phone company and the electric company evaluate the pole for any new attachment. Either company can require that a new pole is installed before a new attachment is included. They said there is no state role, though if they wanted to require pole replacements more often it could be brought to the state.

Joe McGee asked about infrastructure, specifically for electric utilities where the investment decisions are made in terms of rate cases. The role of PURA is to ensure that rates don't rise too dramatically. He said that if he took a train to New York, he would pay for a ticket. If he needed to imbed new bridges, wires, etc., the cost of a ticket would be very expensive. He said that if they came back to the Panel and gave them an estimate as to what it would cost for hardening the system, and Joe McGee said to them that the standard is a CAT 3 hurricane, the system would come down and there are no standards they could give him.

Joe asked how much they had spent this year rebuilding the infrastructure.

The team said \$200-250 million.

Joe McGee noted that we have spent this money to rebuild the infrastructure and it could come down completely in a CAT 3 hurricane. He said that they know how to restructure the system and how much it would cost. He asked why this information has never been presented to the State of Connecticut.

The team said that is probably because the likelihood of a large storm is not immediate. These are once in 30 or 40 year events, and more immediate events are usually at hand.

Joe McGee said he was trying to understand the calculation that a company makes when trying to strengthen a system which is inevitably going to be heavily damaged by a very bad storm.

The team said they would be happy to provide that information. The team also said there is a question to how far you go with the hardening.

Joe McGee said that right now as a customer he is not aware of what the choice is for what needs to be spent to harden the system.

The team said that is a good question; how to spend to invest in these techniques to avoid those extended outages. This is something CL&P is open to in the future.

Joe McGee asked how much of their system is underground currently.

The team said there is approximately 17,000 miles of overhead conductor. That is 73% of total of lines. They said that 27% of the distribution lines are underground and 18-19% of the transmission lines are underground.

Joe McGee asked the team for an analysis of outages for the underground infrastructure.

The team said that during Irene there were about 100 faults which is a small percentage of total trouble calls. They noted there was not a complete analysis for the October storm, but it is likely a similar number; probably less than 1.6%. The team explained that as the new residential developments have underground feeds, they come out of the ground and go overhead and back to the substation. So, an overhead problem would then take out those underground customers.

Lee Hoffman thanked them for providing the EEI assistance agreement, which references the EEI principles. He asked if would be possible to get copy of the principles.

The team said that yes, they will provide that information.

Lee Hoffman said that he noticed on a slide that Western Massachusetts Electric Company lost 145,000 customers or 73% and CL&P lost more than 800,000, or 69%. He asked whether the team had any information as to the mutual assistance calls that were made on behalf of WMECO similar to what they put together on page 12 of the presentation.

The team said the numbers are similar; the WMECO response was similar to CL&P. The ramp up was similar, and as the team recalls, WMECO ramped up to about 300 crews, which is about 10 times their normal crews. They would be happy to give the exact numbers as well.

Lee Hoffman referenced slide 19 and asked if the team could add the DOE restoration curves to that chart.

The team said they could.

Lee Hoffman referenced Mr. Quinlan's written testimony and the initiatives in communications with consumers. He asked what steps they have taken versus what steps they will take in the future.

The team said that they start with the town liaison program. Based on what they heard from Irene, most towns thought it was a good concept and a good program. They have institutionalized that program and as a result of this storm, each liaison has maps that show how their infrastructure overlays with the town infrastructure. They also now have air cards and laptops to open up communication channels. They have institutionalized a daily town information sheet which shows what will be addressed on that day so town officials know what is happening each day. Those are some of the quick hits. Some of the longer term steps, which are technology based, will take more time. They will equip each town liaison with electronic maps which would then be linked with their electronic operations so they have real time data to share with town leaders. They will also link crew location and crew dispatch information which will empower town liaisons to have constructive conversation with town officials. Also, damage assessment done accurately and soon after the event is essential, and requires a partnership. In the longer term they would like to have a more common and consistent approach.

Lee Hoffman said that they touched on the fact that there are a variety of reviews they are undertaking. He asked if someone could comment as to why CL&P is objecting to the Attorney General's request for review of the storms.

The team said they are not aware of any objection. It may be because there are so many independent experts looking at things and that another might complicate things, but they would get a copy of any objection to the Panel.

Peter Carozza asked how medically protected customers are contacted.

The team said that before the storm hit there was an outbound call, in some cases a live call and in others a recording, that warned the medically protected customers of the weather event and the likelihood of widespread outages. They believed it was done for both storms, but they will confirm. The calls were made through their centralized call center in Windsor, CT.

Peter Carozza asked who staffs their emergency operations center.

The team said it is based in Berlin, CT and they have organized chairs identified in their emergency plan which shows a series of restoration experts who are lead by the area commander, a logistics chief, a planning chief, and others who are responsible for planning and deploying resources and making sure logistics are taken care of in the field.

Peter Hoffman asked if the Panel could look at the emergency plan document.

The team said they have provided this document, but they can send additional information.

Peter Hoffman asked about the priority for restoring and he thought he heard that the medically protected were restored first.

The team said it is not possible to restore power for medically protected customers first; restoration is based on where they are on the infrastructure. They prioritize removal of debris from the road with their infrastructure and issues where life-threatening activities are involved. Then they focus on critical customers like hospitals and waste treatment facilities. Then they look at restoration for the most customers that they can get back the fastest. Those typically are the town centers. In both of these events there was a priority on gas stations and food centers.

Peter Hoffman referenced the written testimony and asked if the crews were made up of two people.

The team said that yes, they standardized the definition of a crew as two workers with one vehicle. It could include more than two workers, but it is mostly two. That includes line crews and tree crews and service crews.

Peter Hoffman asked the team to explain the crews.

The team said service crews work on secondary service, usually that which delivers service to the house. The line crews work on the primary services. Those service crews are essentially licensed electricians that they contract from throughout the state. The line crews require additional certifications for the higher voltages.

Peter Hoffman said regarding one of their reviews which is to reach out to their employees and asked for clarification.

The team said that every event they perform a self assessment. They meet with a cross section of employees in different roles throughout the company, including support roles and those who ran EOC's, and teams that operated two of their major satellites. That report was scheduled to be done by now, but they had a two week distraction (the snowstorm) and will perform another for the October storm.

Cathy Osten asked if they have had the chance to install mobile data terminals in their line trucks.

The team said that the mobile data terminals are not in the line trucks. They have distributed them to the damage assessment teams as well as the crew leadership teams so they can update our damage

system remotely. This was a lesson learned during Irene and the team considers it a longer term issue. When they get up to nine and ten times their complement, all of those contractors will not have the technology to update their system. So, the person assigned with the crew teams will need to have the technology to interface with their data systems.

Cathy Osten said that she does not have a clear understanding of how they manage the crews that come in from out of state. She asked when the work orders are designed and how is this information transmitted to the work crews. She noted that many municipalities saw parking lots full of utility trucks.

The team said that in regards to the crews coming in from out of state, first, they get assigned to either a satellite or staging area or EOC. When they come in they go through a safety briefing as they come from different parts of the country so they can understand CT procedures. Typically, many of these crews traveled all day and all night and they have to rest before they go to work. The strategy is to distribute that work force throughout the state so that they can go to work safely and productively.

Cathy Osten asked who develops the next day of workload.

The team said that is determined at each of their area operations centers and at the satellite centers. Each of those has smaller centers that develop the daily work plan on the night shift and submit that at the 6am shift change in writing to the day. The day shift would then draft the night shift work plan and communicate that to the night shift. It is a continuous cycle.

Cathy Osten asked about liability; she asked if there is a certain area in their network that is out regularly. She asked what defines "out regularly" to know to upgrade that infrastructure.

The team said that typically they look at four or more interruptions over the course of the year as out regularly and look at that for the commonality of the interruptions, or, whether it was for disparate things which you do not expect to occur again; in which case you would not develop a plan.

4. Municipal Utilities: Lessons Learned from the Two Storms and Recommendations.

a. Norwich Public Utilities, John Bilda, General Manager: John Bilda presented to the Panel.

He noted that Norwich Public Utilities is smaller. He said they have 928 wire miles in their system which is spread over 165 miles with 10,000 poles over a 30 square mile area. He said they provide this service to those customers with 12 linemen, with a team of four linemen that make up 3 crews. He stated they dodged a bullet with the October storm. He explained when they do experience damage similar to Irene they are uniquely setup as over the last decade they have cross trained their other work groups as ground support to their linemen. Their construction workers provide meaningful and useful support to their ground crews. He noted they double the size of the crews immediately. They are able to ramp up quickly to respond to those kinds of events.

In terms of the EOC and communications, that is located in their building. They built the EOC for the town within their building, and is footsteps away from their ops and control center. They have a web-based real-time update that shows exactly where the crews are crews and what they are doing. The local AM radio station has a live broadcast capability out of the EOC. He stated that during storm Irene he went on live everyday to give the work plan for the day and respond to callers' questions regarding power restoration. He stated that the lessons learned were mostly housekeeping, internal to their organization. He did not believe the restoration would happen any faster, just more methodical, expanding the use of the GIS system.

They are expanding their communications into social media which they did not have in Irene. In terms of infrastructure hardening, he said there is a cultural thing with a municipally owned utility; they know most of the customers and are familiar with them. They take responsibility for that and these are generally not initiated by the customer. They knew there were weak links in the system before the storm and now they have accelerated the process of improving the power to the hospital.

Joe McGee asked whether the lines are overhead or underground to the local hospital.

The presenter said now it is overhead. He noted they will bring it in from two separate pole lines and it will go underground instead of over the Yantic River.

Joe McGee asked how much of the system is underground and how much is overhead.

The presenter said 60% is primary lines and 40% is secondary. He said in both cases about 20% is underground. In some areas the underground and overhead is commingled and in some areas it is 100% underground, which is usually for the critical areas.

Joe McGee asked in terms of the underground system, whether they combine the other utilities.

The presenter said they provide all four utilities to the community only in CT. He noted that where possible, they take advantage of improving their infrastructure. They coordinate their plans with the Public Works plans. Water goes with minimum of four feet of cover. Gas goes on shelf with 24 inches of cover over that, electric about 18 inches away encased in concrete. So they are in the same closet, but segmented.

Joe McGee asked if there is a gas problem, does that take out the electrical system.

The presenter said no, the utilities are all designed to protect from each other.

Joe McGee asked how much experience they have with this combined system.

The presenter stated the underground system began in the 70's, or 40 years ago.

The presenter said that in terms of their tree trimming, they use a four year cycle and communicate via mail stuffers, newspaper ads, and a recording via the phone system. Unless they hear from a customer, they go as far as they can and cut back as far as they can. They own 50% of the poles with AT&T. They are the custodian of 65% of those 10,000 poles where they are responsible for all of the sets. The presenter said they do all of the trimming. AT&T maintenance is limited to the pole and he is not aware of any tree trimming that they do around the poles. Their work practice is the lines to the ground. They inspect the entire system on an annual basis and use infrared inspection to identify weaknesses in the system which could include failures that might occur. In terms of mutual aid, they are dependent on their public power community around New England. There are 79 others like them in New England, with half of those in Massachusetts. It can be easy; unless it is an event that affects all of New England they can get other resources pretty quickly within a two hour drive.

Joe McGee asked about outages in Irene.

The presenter said they have 22,000 meters; half of those were without power. By 10p.m., that number was reduced by 6,000; so they cut it in half. By Wednesday they had everyone back with power. The presenter stated that the service entrance cable on the customer's house can be confusing. The presenter noted the reality is that responsibility lies with the customer. During a

storm, the presenter said they take responsibility for full restoration. That is a different skill level work and they don't rely on the line crews for that work, but work with local electricians who will make that full restoration.

Cathy Osten noted that living next door to them she thought they did a great job in Norwich. Their workers came over and helped out and she appreciated their help.

5. Telecommunication Companies: Storm Impact, Preparation and Recovery. Lessons Learned from the Two Storms and Recommendations:

a. Connecticut Siting Council: Transmission Infrastructure and Cell Towers

Robin Stein, Chairman of the Siting Council introduced his team and presented testimony to the Panel (see attachment D).

Joe McGee noted that the standard in CT is to prepare for a CAT 3 hurricane. He asked who sets the standards for maintaining the tower. He also asked whether the Siting Council does its own independent analysis of strength of winds in New England.

The team said they base the standards on the National Standard. They said they receive information from a telecommunication company who is licensed in the state and certifies that a project meets the standards. The team stated that telecommunication towers certainly do not meet CAT 3 hurricane standards. They noted this is certainly an area that they need to work on, developing whatever standards are chosen.

Scott Jackson asked whether compliance with the National Electrical Safety Code is statutorily regulated or is it more pragmatic.

The team said it is pragmatic; it is not based on an ordinance or a legal requirement.

Joe McGee asked in terms of backup power, who decides the requirement for backup. He asked whether the telecommunications company provides backup on cell towers.

The team said that up to this point it has been the telecommunications company. They noted this is an area where standards are needed.

Joe McGee asked whether this was a federal issue or does the Siting Council have the authority to set these standards.

The team believed they have the authority. They noted that the question might arise whether they have the capability.

Joe McGee noted that they are essentially in the wireless business.

The team agreed, but noted that it was their understanding for a cell tower to work both power and some connection with a landline is needed.

Joe McGee asked whether they have a requirement that cell towers have special priority in terms of restoration.

The team said that the power from the electric system almost without exception is required to be underground. To answer the question, the team said they do not have the ability.

Joe McGee asked, in terms of maintenance, who generally owns tower "A". He asked whether it was the company, the telecommunications company, or a third party.

The team said it is all of the above. They noted that more than one carrier is on the cell tower. They said that by state statute they are to encourage co-location.

Joe McGee asked who sets the standards for maintenance.

The team said the third party or the carrier. It's in their final decision, but they don't have a staff of engineers to maintain the towers. Trimming around the tower does not come within their scope. In most cases the towers are well above the tree line.

Lee Hoffman said that to clarify it sounds like cell towers need a connection to a hard line in order to work correctly. He asked whether there were standards as to that connection.

The team said yes, it is correct that a hard line is needed for the cell towers to work. The team said that no, that connection is not under their jurisdiction. It may be under the national electric safety code jurisdiction.

Also, the questionnaire that they sent out - the information they obtain from that would allow them to better answer questions.

Lee Hoffman asked who was the questionnaire sent to and who responded to date. He asked if this information can be made available to the Panel.

The team said yes, it can.

Joe McGee noted that the Panel is looking at who sets the standards in the state of CT for infrastructure. He invited the team to look at its counterparts in terms of engineering standards and maintenance standards.

The team said they shared that desire too. They noted that the questionnaire was designed to smoke out that experience. In the thrust that you are after, we are unaware of any tower physical failures. They are aware that there are a number of towers that lost electrical power and the land links to the communications system. The team noted that 8 hours of battery was where they were, but how far they have to go remains yet to be seen

b. AT&T, John Emra, Regional Vice President

John Emra gave this presentation to the Panel (see attachment E).

Cathy Osten noted that some poles in the state have only cable and telephone on them. She asked whether AT&T has any responsibility for trimming.

The presenter said they do not trim near electric lines. He noted that sometimes they will bill us for trimming, but if there is trimming to do around the telecoms towers they are responsible.

Cathy Osten asked whether the company communicates directly with the tree wardens

The presenter said yes, with them and the homeowners.

Cathy Osten noted that the presenter said he has 44% of telephone communications in the state. She asked what happens with your wire that would be on an electric pole that doesn't have a customer on it.

The presenter said they clear it whether there is a customer on it or not. He noted they have an 800 number that we provide to cities and towns.

Cathy Osten asked whether the presenter planned on moving towards a town liaison or work on a regional level.

The presenter said they have personnel assigned to geographic regions to the state and they are the local contact. He said he did not see them having a scenario where they man every local operations center in the state. There is an external affairs management assigned to every town in the state. A list of them can be provided.

Scott Jackson said that they send tree crews out when necessary, other utilities send them out. He asked whether there is a better way. He asked what the presenter recommended.

The presenter said that he thinks the electric companies' needs are more difficult and different. He also thinks the companies that are on the poles need to do a better job of coordinating their activities. They do a pretty good job as they are joint owners. The presenter was not sure he is able to provide a best practice for the Panel, but, someone surely has developed ones.

Joe McGee noted that AT&T is the pole custodian for half of the poles jointly owned with the electric company. He asked what AT&T's custodial role is, not only in terms of trimming and maintenance, but in terms of engineering and strength of the pole and what can be attached to the poles. He noted that there was extensive testimony from Florida, but there does not appear to be much record of this issue in CT.

The presenter said they follow the NESC code. As people apply to attach to the pole, they have to get an agreement with the EDC and AT&T. Once you have that, you go through a make ready process. From our perspective, you look at how old the pole is, how big the design is and load, what do they want to put on the pole, and what other attachments are on the pole. In Stamford or New Haven there could be many telecommunications companies attached to a pole. If the pole is no longer in compliance with NESC, then there needs to be a new pole. He stated they are making the judgment according to federal standards. If they fail to follow those standards, PURA has authority to fine companies over the right of way.

Major General James Skiff asked about the robustness of their emergency capability.

The presenter said In terms of numbers of vehicles, he recommend the Panel to go to the website provided. After Irene, they deployed to multiple states and did not charge for it, as it is the right thing to do. Sent a satellite COLT, that is the wireless infrastructure to be able to recreate a large central office in a matter of hours. The wireless infrastructure they can bring is an amazing feat, but he noted the wire structure surpasses the wireless structure.

Major General James Skiff noted that every state in the military has a very robust system as well.

The presenter agreed and noted that their system is based off of the military. He noted they do live drills because there are no substitutes for live drills. He also noted that the relations between Homeland Security and FEMA are very deep.

Major General James Skiff noted this is critical. He said we may get to the point of a standard that could survive the CAT 3 storm, but in the meantime we need your mobile infrastructure.

The presenter noted that it is important to remember for the backup sites, their cell towers are designed to withstand winds in excess of 100mph.

Joe McGee asked if that information can be put into writing.

The presenter said he will find out specifically and get that back to Panel.

The presenter said that most sites are where the tower is located and are owned by private land owners. He said what if the State mandated that a generator is needed at every cell site. He noted AT&T is a tenant, and if the landlord does not want to have a generator at the site he asked what can be done. He also asked whether the State was going to give AT&T the power to condemn the landlord's property for the purpose of building a generator. Also, he wanted the Panel to understand there are rooftops where generators cannot be placed.

Joe McGee asked about their backup standard. He noted that a state agency said there are multiple standards. He said that the Panel needs to know what a standard is that AT&T would recommend for which their system should operate. He also asked that this information be known publicly so the information may be compared that of Verizon, and other companies.

The presenter said that he did not have a specific answer and in reality it is tough to understand how long backup power will last. He asked whether the Panel was going to create a standard with specific time conditions with usage, etc. He also said that CTIA might be able to provide further information.

Joe McGee thanked AT&T for the presentation.

c. Verizon, Daniel E. Mullin, Executive Director-State Public Policy, Verizon Wireless HQ, Morristown, NJ

The presenter introduced his team to the Panel. The team stated they did not prepare a long presentation and that they came prepared to answer any questions. They noted they did very well throughout all the storms being discussed today. They stated they provide permanent backup systems in all the areas where they have the ability to do so.

Joe McGee asked about the backup standard.

The team said it is the company's policy to provide backup systems wherever it is possible. They are now going to landlords where they were not able to get previous approval to see if they are able to at this point. They provided an explanation of the structure of the network. The team said that in order for wireless facilities to work, commercial power and telephone connections are needed. He said that if commercial power is lost there may be backup generators, but telephone connection is still needed to operate. What they do after all of the storms is analyze how each vendor and provider performed. The company speaks with those that did not perform well to see how they can improve. If they do not improve then the company changes vendors.

Joe McGee asked whether the generators were diesel. He asked about the makeup of power source.

The team said that most are diesel, but in areas where there are environmental concerns, propane is used, or on top of buildings they may tap into their natural gas system;

Joe McGee asked whether there were 24 hours of power on a diesel generator.

The team said they find the generators run for 2-3 days.

Joe McGee asked what happens after those 2-3 days.

The team said when they get low on fuel they will move into refueling mode and they prioritize the refueling effort to stay in front of hundreds of generators running out.

Joe McGee asked how many generators were not refilled in the snowstorm.

The team said not many, because they topped off the generators knowing the storm was coming

Joe McGee asked whether there is a priority list for electric companies to restore power to their cell.

The team said they were not sure that they are on a priority list.

Joe McGee asked for recommendations.

The team said that approximately 10% of the sites that do not have generators they are trying to determine if any changes to the site will make it possible to put a generator at that location. The team also noted that they were to review performances and eliminate weakness.

Joe McGee asked how the backup generation determined.

The team said they would like to improve percentages and it varies from state to state.

Joe McGee noted that there is not a requirement in CT. He asked whether that was the company's decision.

The team said it is their decision; it's been a company standard as long as the team has been with the company.

Scott Jackson asked whether there was any commonality to those areas that do not have backup power.

The team said they are leasing sites and work closely with the Siting Council. They may determine that they will not get anywhere with a particular landlord, and so they work toward co-location. In cases where they do not have a permanent generator, they will put in a plug and put a portable generator at the site on a temporary basis.

6. **Break:** The Panel decided to skip the break.
7. **Sea Level Rise: Planning for the Impact of Increased Flooding Under Climate Change on Connecticut's Infrastructure:** Paul Kirshen, Ph.D, Research Professor, University of New Hampshire: Dr. Kirshen gave his presentation to the Panel (see attachment F).

Joe McGee clarified that the sea rise is a fact, not a fantasy.

Dr. Kirshen said that all of the world's scientists believe that sea rise is a reality.

Joe McGee clarified that the CT is facing a sea rise level of 1 to 2 feet by mid-century and 3-6 feet at the end of century. He asked whether the state of CT is factoring in sea rise into its infrastructure planning.

Dr. Kirshen said he was not familiar with CT's planning, but he noted Maine is planning on 1.6 feet of sea level rise, which he thinks is much too low.

Joe McGee noted that Dr. Kirshen is essentially saying that large chunks of CT will be under 6 feet of water at the end of the century.

Dr. Kirshen said that is correct. He noted that CT DEEP has some maps on their website that may provide further information.

Joe McGee asked whether the situation of the underground infrastructure is extremely severe along the coast.

Dr. Kirshen said that yes, the water supply, sewer pipes, roads, etc.; everything that is along the coast.

Joe McGee asked whether states were responding to this information.

Dr. Kirshen said it was difficult to answer this question. He noted that coast states are aware of the problem, but he is not sure about the actions of each state. He said that CT can expect 1.6 feet sea level rise, but he is not sure what CT is doing. He noted that major cities are making changes based on the consideration of climate change.

Joe McGee thanked Dr. Kirshen for his presentation.

8. Impact of the Two Storms on Connecticut's Municipalities: Recommendations for Improvement

The following presenters introduced themselves to the Panel:

Mary Glassman, First Selectman of Simsbury
Barbara Henry, First Selectman of Roxbury
Steve Werbner, Town Manager of Tolland
Lisa Pellegrini, First Selectman of Somers
Ryan Bingham, Mayor of Torrington
Matt Galligan, Town Manager of South Windsor
Scott Slifka, Mayor of West Hartford
Mark Lyon, First Selectman of Washington

Mary Glassman presented testimony for the group to the Panel (see attachment G).

Barbara Henry presented to the Panel.

Barbara Henry said that there was an issue with the response from the state DOT. She said that the town had firefighters and contractors out and cleared and plowed the roads themselves without any help from state DOT. She said they had to wait extensively for CL&P crews to arrive. Once they arrived, they were great.

Joe McGee asked to clarify the issue that the issue is with the state DOT.

Barbara Henry said that the issue is with the DOT. She said they were told this storm was taking the predicted track, but told it was going to be a quick cleanup, but that was not the case. She noted that DOT was going to disapprove, but she hired people to clear their roads. She said that on a conference call

she was informed that CL&P crews were waiting to assist them, but she did not see these crews. She was disappointed in the response time.

Joe McGee asked who cleared the roads.

Barbara Henry said that fire and public works, and they hired local contractors to help with loaders, cut trees, and opened the roads. She said they had one crew the first day. They were told that they had to go to Hartford to pick up the MRE's, but that wasn't part of the plan. These were supposed to be distributed. Eventually they were delivered by the National Guard. She said that if they could pre-stage a CL&P crew in each town before the storm it would be very helpful.

Steve Werbner presented to the Panel.

Steve Werbner said that four crews were assigned to nine towns in their area in the first two days. Out of those crews, they had two crews for three hours each. On the third day they received four crews from out of state. He said they were told these crews would be working with them through the evening. He rented lights, held their crews on overtime, but they reached their limit at 9pm that evening and would not be able to work more overtime. No other crews would be able to commence further work that evening. On day 9 of the storm they still had roads closed. It took six hours to open those 15 roads that were closed. He asked whether it is possible to safely close the grid down so that roads can be cleared quickly. He said their town put information on GIS maps with road closure information. He cannot believe that the smaller towns could provide information that CL&P could not. In the October storm, the liaison came to Tolland and asked for a list of priorities. This information should be available to CL&P already. He said that 30 units of elderly housing in the center of the town were without power. It took 2.5 hours to make necessary repairs. He said residents would call to ask how many crews were in Tolland. The response would be 280, etc., but these were the crews who were in parking lots. He said the liaison was excellent and they worked well together. However, the liaison did not have resources to work with. He asked why crews couldn't be held over earlier. It is his opinion that the power was out longer than necessary. He provided a list of recommendations to the Panel.

Lisa Pellegrini presented to the Panel.

Lisa Pellegrini said her town was out of power for 12 days. She said their emergency management plan was good and they had shelters up quickly. She said that DPW was out plowing. The next day she met with the liaison. He took a tour with the superintendent and never came back. Later that afternoon they were told they had a new liaison. They were told they could give three priorities. Obviously they have more than three. She said they did an assessment of priority roads and all roads in Somers. They documented every pole that was down and every transformer that was damaged on Monday. They provided this information to the liaison and he said they would get crews there. The first tree crew came in on Saturday after the storm. The Friday after the storm she was promised a crew to come in and address the lines around the 55 and older community. This did not happen. She called her liaison and was told the crews were not coming and they probably were not coming on Saturday morning. As town leaders, we need real communication from CL&P. Give real estimates on time for outage recovery. She said that CL&P asked for priority 1 calls, which was for emergencies. She had one of those and called, but they did not call back. Her FD personnel put their equipment on their backs and used an ATV to respond.

Ryan Bingham presented to the Panel.

Ryan Bingham stated that he wanted to underscore communication. They were very happy to see the liaison from CL&P. However, he is only as good as the information he receives from the operations center. It is important to know accurate restoration projections. He noted that they are here to help the Panel and are happy to be of assistance.

Matt Galligan presented to the Panel.

Mr. Galligan stated that the priority should be public safety. He said that the communication with the liaison was good, but she can only pass along information and the source wasn't good. Mr. Galligan also discussed the issue with the State WebEOC website. He said he only got emails and text messages from the state even though they are putting information into the WebEOC.

Joe McGee said he would like to understand the WebEOC.

Matt Galligan explained that you enter all of the data into the WebEOC. He said the state's EOC list came out and South Windsor was still not on the list 10 days later. He said if they had to communicate electronically, we have to make sure it works.

Joe McGee asked whether this happened to anybody else.

Barbara Henry said it happened to them in Irene.

Mary Glassman noted there was a disconnect;

Steve Werbner said where they lost power, they lost communication. This meant no internet and all information coming out of EOC was via internet. EOC was advised that the town could only communicate via telephone, but EOC failed to operate in this manner

Lisa Pellegrini said that internet was down, but had everything forwarded to her cell phone. The problem was that it's a lack of communication

Lee Hoffman asked what would have happened if the cell tower went down

Lisa Pellegrini said they had maintenance people ready to do repairs on cell tower, but was denied access. She reached out to the Governor for help. Thanks to the Governor it was taken care of in five minutes

Scot Slifka presented to the Panel.

Scott Slifka said that 98% of West Hartford lost power; 28,000 homes, \$7 million for debris cleanup. He said the relationship with CL&P started well. For eight hours on the second day their liaison was unreachable. This was a critical decision making day and they could not reach anyone. Through day four or five there was a minimal number of crews working in West Hartford and expected at this point that they would be on their own. Through day 7 and 8 they could not confirm who would be working in their town. So, he sent out police officers to talk to the supervisors at the staging area at the mall. On day 10, finally they were to a point where power was coming back on in the town. An executive came in and asked what he could do to help. The DPW Director requested that CL&P crews take down whatever hangers they saw in addition to those that were on wires. The response was that they would take it under consideration. Mr. Slifka was asked if he would be honoring the commitment that the DPW Director made that we would reimburse CL&P, which was a misunderstanding. Mr. Slika provided a list of recommendations to the Panel.

Mark Lyon presented to the Panel.

Mark Lyon said they had a good field supervisor who was knowledgeable about the situation. This is something that CL&P should work to implement in all towns. Crews that didn't have local supervisors, in Irene they had out of town work crews, and they did not have knowledge of the local systems and so lost

efficiency. He said they had no contact from AT&T and that was through the CL&P liaison. He noted that numerous AT&T lines were down. He said that DOT in Irene and the October storm were unseen for a day or day and half. Their crews spent time clearing DOT roads. During the October storm, there were state highways down to single lanes up until Tuesday. Local volunteers stepped up and local organizations stepped up. They had the CL&P liaison in both storms and sent priorities to them in both storms. They should have these priorities up front.

Scott Jackson thanked the presenters for coming. He noted that he heard earlier that morning that UI and CL&P combined to expend about \$275 million to restore power in the last sixty days. He heard the municipality amounts as well, so there is a lot of money on the table. He noted this could be equal to what it would cost to remove every tree. He asked how the municipalities felt about regional efforts. He asked whether the state regional offices should play a greater role in assisting the municipalities for storm restoration.

Mary Glassman said they found that a lot of the circuits were regional. As such, crews working in Avon might restore power to customers in Simsbury. If the circuits dictate that towns combine together, it might provide for more efficiency. Towards the end, they combined as a five town region which proved helpful.

Ryan Bingham said that when commodities were dropped off and communities didn't receive them they were communicating on a regional basis. So, unofficially, communities are working together on a regional basis. He said that if we were to completely regionalize, it might be to the community's detriment as we need the local knowledge in an emergency.

Steve Werbner said that in terms of shelters, the Red Cross no longer supplies shelter assistance, which was news. The only assistance that they gave as he understood was if you had a regional shelter, the Red Cross only comes in after a period of time. If this had been a longer outage and more people needed shelters, Tolland could not have handled it in a regional community.

Major General James Skiff asked whether their communities have CERT teams.

Ryan Bingham noted that those teams could be trapped in communities as well.

Major General James Skiff noted that in the case of municipalities, first responders are needed. He said the towns need to take the lessons learned from this. Hopefully some of those teams can get out, and in the event of the CAT 3 storm the towns may lose a very high percentage of their response in the early days due to the storm. He noted that towns need to understand that this storm didn't come close to the significant devastation that they could face; devastation which requires the guard to come in. He said he would be interested to hear best practices. He noted that we don't bring 50,000 troops into Louisiana, they come from all over. He said we need to look at what our capabilities are; CERT is just one bit. He noted that shelters are huge and certain vulnerable population are not going to survive and we need to know how to help them. He said that municipalities have great experience and they're the first response. He said he wouldn't wait for the Red Cross; get a CERT program going.

Matt Galligan said that they made a recommendation to this legislature that a reimbursable expense would be to put in a fuel source.

Mary Glassman said it might be helpful for the Panel to hear about how they got some of their elderly and medically challenged people into shelters.

Linda Scofield from Simsbury presented to the Panel.

Linda Scofield said the nursing facilities were willing to take people in if towns could get them State help. She said these are not things that we want to be worried about in a time of crisis. These facilities wound up not being able to take in and shelter people and these people ended up staying in a much less safe place. She liked the idea of a regional center.

Major General James Skiff said it would be good to get some of those details. He noted that the Panel has heard that there weren't enough shelters in addition to those homes.

Mark Lyon said that the emergency generator failed at the EOC, and they had help. The regional DEMHS representative was excellent and worked very well from a regional perspective.

Cathy Osten thanked everyone for coming. She would like them to weigh in on tree trimming or whether or not to go underground. She noted they are probably in the same position as her town; they have been cutting budgets for four years. Many trees that fell down on wires had never been trimmed as a result of a CL&P or UI budget. She asked whether each one of them put in a budget just for trimming trees over or on the opposite side of the road from where utilities are located.

Matt Galligan said it can be \$100k to \$125k per year.

Joe McGee noted that the figure given was \$42,000.

Matt Galligan said it is split between two departments. So total tree trimming could be about \$100,000 minimum. A few years ago CL&P came through and did a nice trimming program about 8 years ago and those areas did not have any outages.

Joe McGee noted that the Panel was told CL&P cut on a four or five year cycle.

Matt Galligan noted that this was a special program. They were coming in to increase the power in town so had a nice trimming program.

Scott Slifka said they spent \$161,000 on tree trimming that goes through public works budget. On regionalizing, he would urge caution on that as it depends on the size of the communities and the scope of the mission. He would be hesitant to include some other operations in a more regional discussion, for example the coordination of cleanup crews. These crews are already on the ground and they know their communities better than anyone else.

Mary Glassman said that in 1993 there was a docket that provided a great program for tree trimming and discussed a greater need.

Steve Werbner said that a smaller community, the budget is \$20,000, but they have many more trees than many other communities. In Manchester, they had their own bucket truck and could handle this on their own. That is something they will look at. For regional efforts, they overlap regional boundaries, so it might be difficult coordinating on that level but they now have to talk to their neighbors to ensure that they can staff what they need to in their own four or five town area.

Barbara Henry said that their budget is about \$25,000. She said that before this storm, CL&P was in town the week before. They regularly come through and trim trees, but in both storms none of that worked. All of the water created a lot of uprooted trees. The next town over is Washington, and it was five days before they could get out of there and into Washington.

Matt Galligan noted that also doing a regional level looking at pets and shelters as well.

Joe McGee noted that previously UI said that they had 300,000 trees in their 17 towns that they could take down in the distribution line right of way. If we came forward with a suggestion that all trees under wire have to be removed; he asked what would happen in their towns.

Mary Glassman noted that if we ask them soon, she thinks there would be support. In New England there is some stress caused by historic trees. They would be partners and if there is a coordinated effort to remove trees that could cause large long term outages they would be supportive.

Steve Werbner said that there has not been much improvement in the protection of the utility lines. He noted that we can't assume that if we do nothing we can expect there will be a different result. If CL&P comes in and shows a map of where the tree problems are, they would be willing to have a good conversation. This should be an immediate need. His community would not be happy to take down every tree under a power line, but they would consider it in a discussion.

Joe McGee asked what the appropriate budget for a town is for the tree trimming program. He asked whether the town and the utility should come together to confer on this program.

Steve Werbner said now is the time to have that discussion. Budgets are being prepared soon. There's nothing more important as it will happen again.

Mary Glassman noted that it's about leveraging resources. She said that if the towns can't see a circuit map, they can't imagine they will see a tree trimming map. She said if we are trimming trees that aren't near the transmission lines, there won't be an impact.

Cathy Osten said that if we could work with a group of four or five towns and got those circuit maps delivered to the council governments, the towns would not have 169 meetings with CL&P and could pre-plan.

Mary Glassman said she agree that in some cases it makes sense to combine efforts and in some areas it doesn't. It's about providing information and determining the best way to work through those systems. In their area, the five towns were so knitted together that circuits had to cross over town boards in order for them to be restored.

Steve Werbner said they were told that for security purposes that information could not be released to the community and that it had to be taken back. As a note, something would have to be done to ensure that information is protected from FOIA.

Barbara Henry said she is not interested in going to COG to learn how to read the maps. That might work for other towns, but she knows where the power comes into Roxbury. With tree trimming under the wires, in her town, there is not much under the wires. The problems are the ones that fall from a distance.

Terry Edelstein said on setting priorities, should be looking for input on how the towns set priorities and how they work with other organizations. She maintains that those services for people with disabilities are best provided in their own homes but, they might live in a home at the end of a road that does not have power for eight days. She asked how the towns work with local service providers in their communities to ensure the safety of the people that they support.

Mary Glassman said that emergency operations plans require them to have a list of priorities. She said they communicate them to CL&P. She noted they were repeatedly asked for their priorities. The priorities haven't changed in ten years. She said they need the center of the towns open, etc. With respect to working with other partners, she noted they proved they did well for 8 days. The frustration comes with

those partners not being at the table. Many relied on business owners because some did not have access to the MRE's.

Matt Galligan said they keep a log in the human services department of all people who need special care. They opened the shelter right away. The police went out and knocked on doors and brought them into the shelters. They have a contract with visiting nurses. The superintendent of schools was at their EOC every morning and had tools to get to residents. They fed people through their food service and did not have to rely on restaurants. They setup the town hall as a charging station, warming center, and community center. Everybody pitched in and the priorities are the same priorities.

Joe McGee asked whose decision it is to reopen schools. He asked whether the decision belongs to the mayor or the superintendent.

Mary Glassman said that the superintendent makes the decision, but they aren't necessarily getting the same information that the towns were getting from CL&P. She noted that ultimately it is a public safety issue for superintendent to resolve.

Scott Slifka said they had to clarify that getting the power back on was the first variable to get kids back to school. The superintendent was running the shelter and people would be proud to see how public employees stepped up. She was making that decision based on the safety of the kids and their ability to get to school. She said I have 10,000 students, 5,000 walk and 5,000 take the bus. The real danger was what happened when they went to go to school. Those from the beginning could change daily and we could have an assisted living facility that was online and then lost power after a few days and would then have a lot more people in the shelters. The action plans are static, but we need to recognize that there is fluidity to them.

Ryan Bingham said that they also used the meals on wheels program. They may not have had power to cook the food, but they went out to houses to see if there was a need to bring people in or have the ambulance to go and take a look at them. Their local groups could perhaps use a checklist on how to react to those situations.

Lisa Pellegrini said they had limited resources. They would do a flyer every day and had her staff walk around the neighborhoods. They were ambassadors letting everyone know what was going on.

Barbary Henry said that in her town they have a lot of individuals that won't leave their homes. They know people who have special needs and that list changes on a daily basis. They had police, fire, and EMS checking on people daily. They also had a number of portable generators that they gave out.

Scott Jackson said they talked a lot about power here today, but the Panel is looking at infrastructure. He noted that we don't want to lose sight of other things like dams, bridges, and fire issues.

Joe McGee thanked the municipalities. He noted that the recommendations are very important to the Panel. In conversations with Florida, they do real time training and they have county government. That is once per year before hurricane season starts. They bring together everyone; the towns, the utilities, the telecom companies and go through an event. They have said that has been really significant in working out a lot of these issues. He asked whether this was something the towns would value and would wish to participate.

Mary Glassman said, yes. They receive NIMS training and an emergency is not a good time to introduce ourselves to each other.

Ryan Bingham said yes, we just went through an emergency which was good training. Still, it would be nice if we could see some changes to the system then do some training.

Joe McGee thanked the presenters.

Major General James Skiff thanked the presenters for their input.

Citizen was wondering why NE Utilities was so slow in hiring local contractors.

Joe McGee said that question will be addressed in the Panel's work.

9. **Adjournment:** Cathy Osten moved to adjourn the meeting at 4:03p.m., seconded by Terry Edelstein. All members present voted in favor. The motion carried.

Attachments

- A. **Email from Eric Johnson to Joe McGee re: ISO, dated Monday, November 14, 2011**
- B. **UIL Holdings Corporation, governor's 2 STORM Panel, November 15, 2011 Presentation**
- C. **Testimony of William Quinlan, Vice President of Customer Solutions, the Connecticut Light and Power Company, November 15, 2011**
- D. **Testimony of Hon. Robin Stein, Chairman, Connecticut Siting Council, Submitted to the Joint Storm Panel, November 15, 2011**
- E. **Presentation to Two STORM Panel, John Emra, Regional Vice President, AT&T Connecticut**
- F. **Sea Level Rise: Planning for the Impacts of Increased Coastal Flooding Under Climate Change on Connecticut's Infrastructure, Paul Kirshen, Ph.D., November 15, 2011**
- G. **Mary Glassman Testimony, Tuesday, November 15, 2011**
- H. **Letter from Barbara Henry, COST President, to the Two Storm Panel Members, re: Storm Response Efforts – Municipal Recommendations, November 15, 2011**

Submitted By:
Mike Caplet
Lauren Mauer

(A)

Joe McGee

From: Johnson, Eric [ejohnson@iso-ne.com]
Sent: Monday, November 14, 2011 9:41 AM
To: jmcgee@businessfairfield.com
Subject: ISO

Joe,

You asked for information on transmission line outages for Tropical Storm Irene and the October 29-30 snow storm. This is the notice we sent last week to state/regional/federal officials reporting on the number of transmission line outages as a result of the recent snow storm. I've included below information on transmission line outages from Irene from ISO's testimony before the STORM Irene panel.

The region's bulk transmission system is owned and maintained by transmission companies in New England such as CL&P and UI. The ISO operates the bulk transmission system under agreements with the transmission companies; the ISO does not own any transmission facilities. The bulk transmission system in New England essentially includes lines rated 115 kV and above.

Tropical Storm Irene resulted in no 345 kV line trips, two 230 kV line trips, and forty-one 115 kV line trips.

The October snow storm resulted in three 345 kV line trips, no 230 kV line trips, and fifty-two 115 kV line trips. (See the notice below for a breakdown by state)

Voltage Class	Transmission Outages: <i>Tropical Storm Irene</i>	Transmission Outages: <i>October 29-30 snow storm</i>
345 kV	0	3
230 kV	2	0
115 kV	41	52

For causes of line outages, we recommend that you contact Dave Boguslawski at NU: 860-665-6115, bogusdh@nu.com.

Please let me know if you have any questions.

Eric

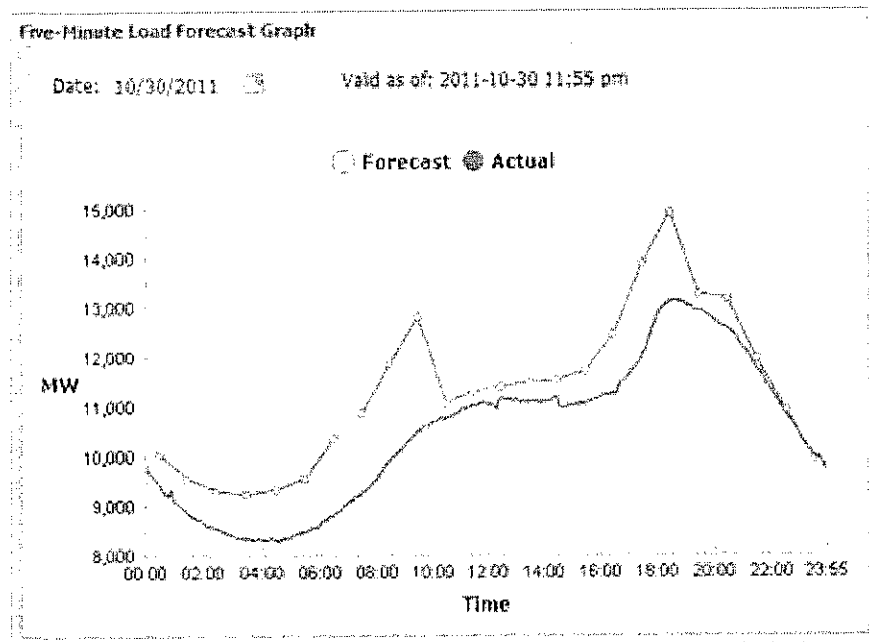
TO: OP4 Contacts
FR: ISO New England Corporate Communications and External Affairs Departments
DA: November 8, 2011
RE: ISO-NE update on October Snow Storm

ISO New England implemented several procedures to maintain the reliability of the region's bulk transmission system before, during, and after the snow storm that hit New England Saturday, October 29 and Sunday, October 30. Transmission line outages that resulted from the storm are identified below.

ISO New England implemented an *Abnormal Conditions Alert* for all of New England on Saturday, October 29, at 1 p.m., and cancelled the alert on Monday, November 7, 2011 at 11:15 a.m. This alert, known as Master/Local Control Center Procedure 2 (M/LCC-2), is implemented to inform power system personnel that abnormal conditions affecting the reliability of the power system exist or are anticipated. The procedure requires power system personnel to take precautions so that maintenance, construction or testing activities do not further jeopardize the reliability of the power system.

Changes in System Load

ISO revised the load forecast during the day Sunday in response to the loss of load during the storm. The following figure shows the forecast and actual loads on Sunday, October 30, for all of New England.



The ISO twice implemented a procedure on Sunday, October 30, to back down excess generation when generation exceeded the region’s demand for electricity. Excess generation conditions resulted from the loss of load on the system due to the storm. This procedure, known as a Minimum Generation Emergency, allows the ISO to back generators down below the minimum level at which they are economic to run. Once a Minimum Gen Emergency has been declared, the ISO administratively sets the real-time locational marginal prices to \$0 per megawatt-hour.

The region did not experience any major generator outages or reductions during the storm.

Transmission Line Outages

The snow storm resulted in outages of 115 kV and 345 kV transmission lines, primarily in Connecticut and western Massachusetts. The following is a breakdown of storm-related transmission line outages by state and by voltage class. This includes transmission lines that tripped between 12:00 p.m., on October 29, and 12:00 p.m., on October 30, and remained out of service during the storm. All of these lines have since been restored to service.

State	Voltage Class	Number of Transmission Line Outages
Connecticut	345 kV	3
Connecticut	115 kV	29
Massachusetts	115 kV	19
Rhode Island	115 kV	1
New Hampshire	115 kV	3
Vermont, Maine	115 kV and 345 kV	0

Total		55
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If you have any questions, please contact an ISO New England External Affairs Representative:

- ? Eric Johnson (phone: 413-540-4515, email: ejohnson@iso-ne.com)
- ? Michael Giaimo (phone: 413-540-4576, email: mgiaimo@iso-ne.com)
- ? Eric Wilkinson (phone: 413-540-4686, email: ewilkinson@iso-ne.com)
- ? Jeff Turcotte (phone: 413-540-4602, email: jturcotte@iso-ne.com)

Ⓟ

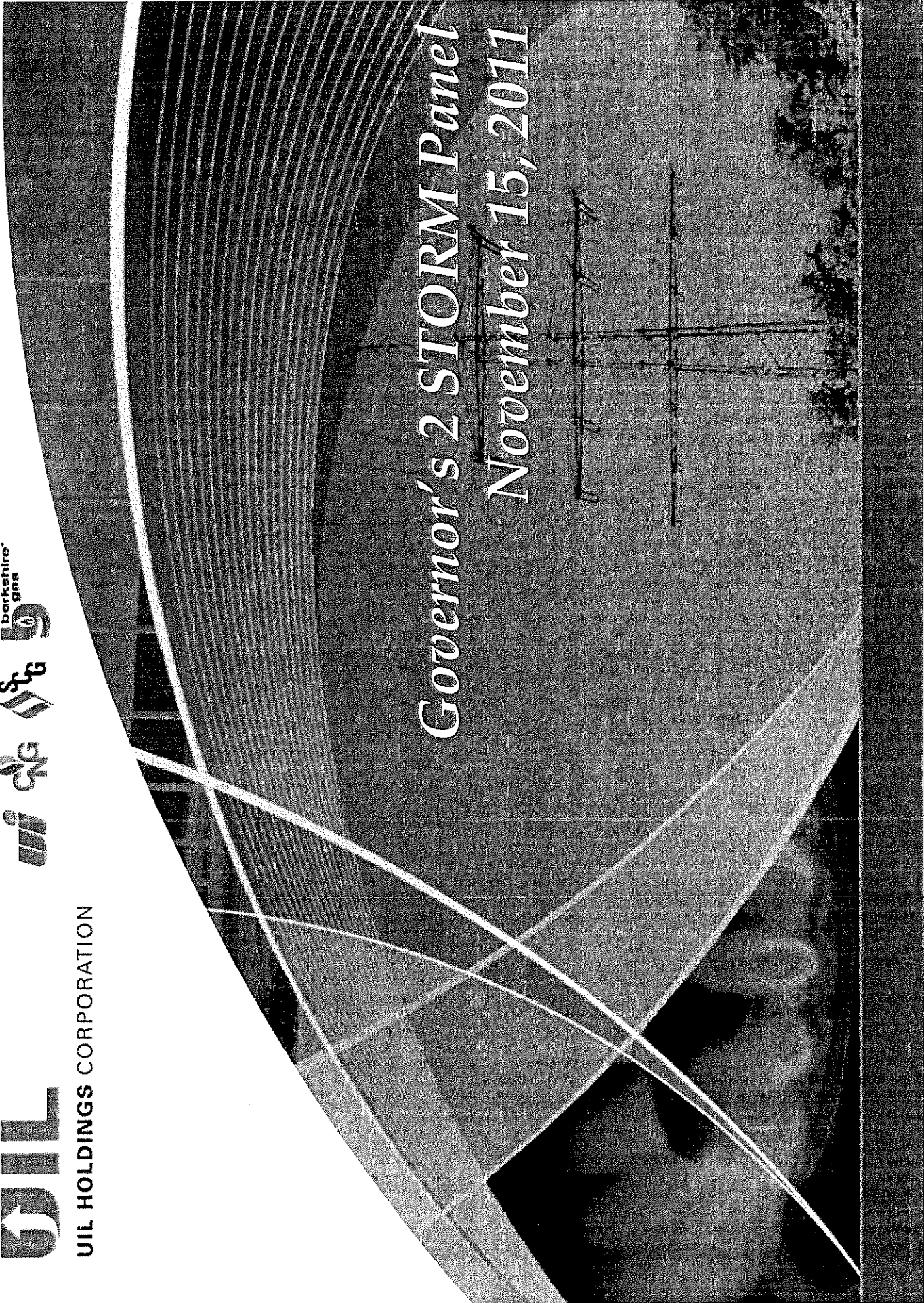
UIL

UIL HOLDINGS CORPORATION



Governor's 2 STORM Panel

November 15, 2011



I. UI Storm Restoration: Plans, Organization, Processes

- A. UI's Emergency Plan, Organization
- B. Overview of UI's Storm Processes
- C. Assessment & Restoration
- D. Outside Assistance (Including Mutual Aid)
- E. Potential Limitations on Crew Utilization

II. Comparison of Irene and Alfred

- A. Storm Severity, Damage
- B. Restoration

III. Lessons Learned and Recommended Enhancements

- A. Lessons Learned and Next Steps from Irene
- B. Irene Lessons Utilized in Alfred, Initiatives Underway
- C. Near- and Longer-Term Improvements Planned/Recommended
- D. Other Potential Enhancements to Assess

UI's Emergency Preparedness

Plan:

- Systematic approach to recover from the effects of an emergency
- Enables response to a wide range of incidents. Examples:
 - Weather Events, UI System Blackout, CONVEX System Emergency, including load shedding
- Utilizes an Incident Command System (ICS) – See next slide

UI's Restoration Objective:

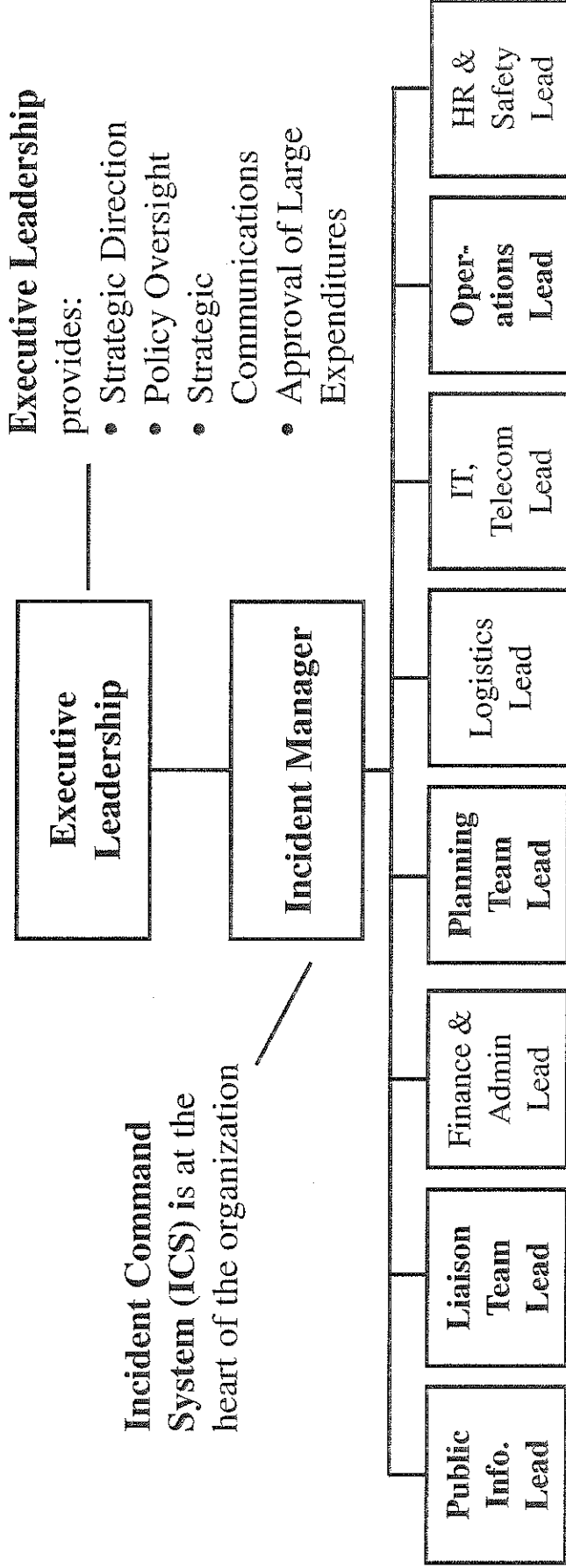
Safely restore electric service to the largest number of customers in a minimum amount of time, as efficiently as possible.

UI's Restoration Priorities:

UI's balances its priorities (below) with town priorities: to clear roads, make safe ... But, this does impact restoration duration.

1. Immediate Life Threatening Situations, Public Health & Safety
 - e.g. major hospitals, evacuation centers, as prioritized by municipal officials.
2. Substations, Transmission Lines, Primary Distribution Feeders
 - i.e. restoration to a maximum number of customers in a minimum amount of time.
3. Single and Three-Phase Laterals
 - i.e. restoration of equipment and lines serving groups of customers
4. Distribution Transformers & Services

UI's Emergency Organization:



Stakeholder Communications is

critical. Information must be: effective, timely, accurate.

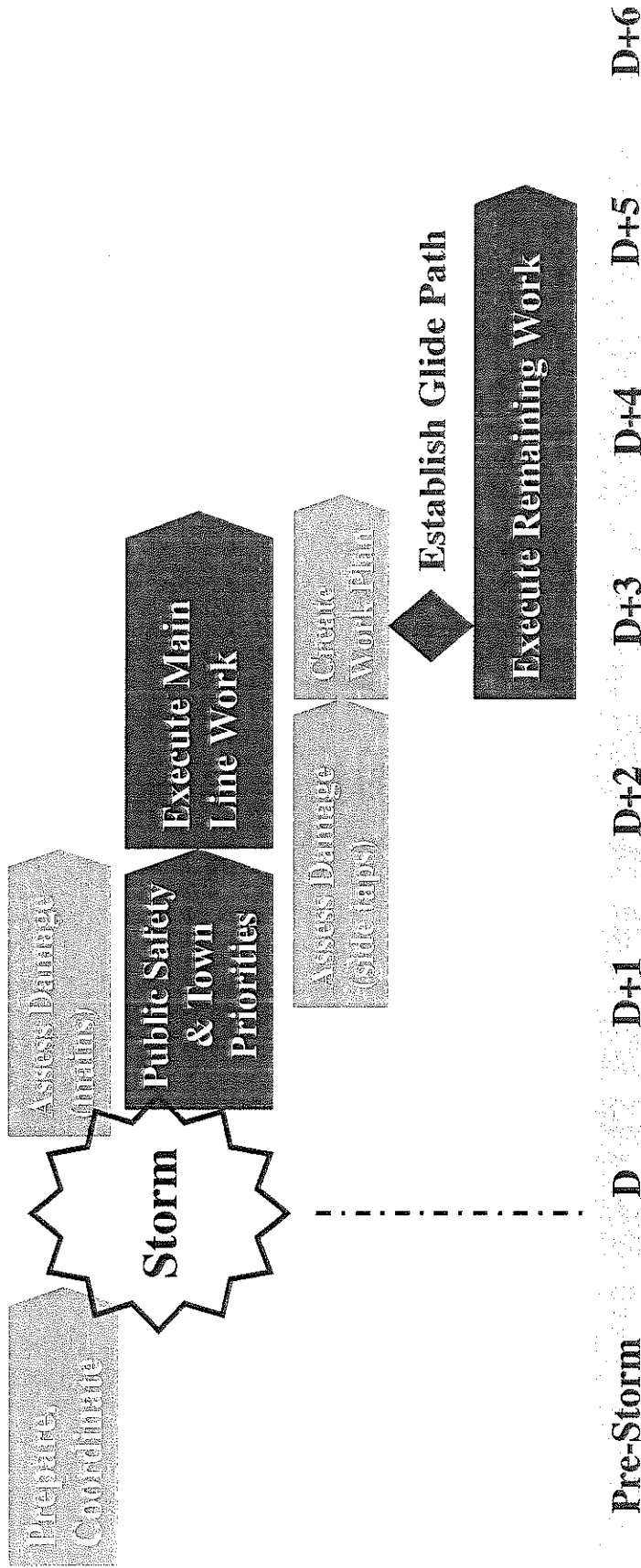
Distribution Damage Assessment

- Multiple steps
- Identify, match resources, assign work

Operations is focused on five critical areas:

- Transmission/Substation Damage Assessment
- Wires Down
- System Operations
- Customer Call Center
- Construction

Overview of the Generic Process



Preparations, e.g.:

- Model predictions
- Mutual assistance coordination
- Communications to government leaders
- Notify towns – likely outage durations
- Activate Storm Plan
- Staff State EOC
- Staff Storm Center

Generally all UI's significant events utilize this general process, but the two storms were different:

For Irene:

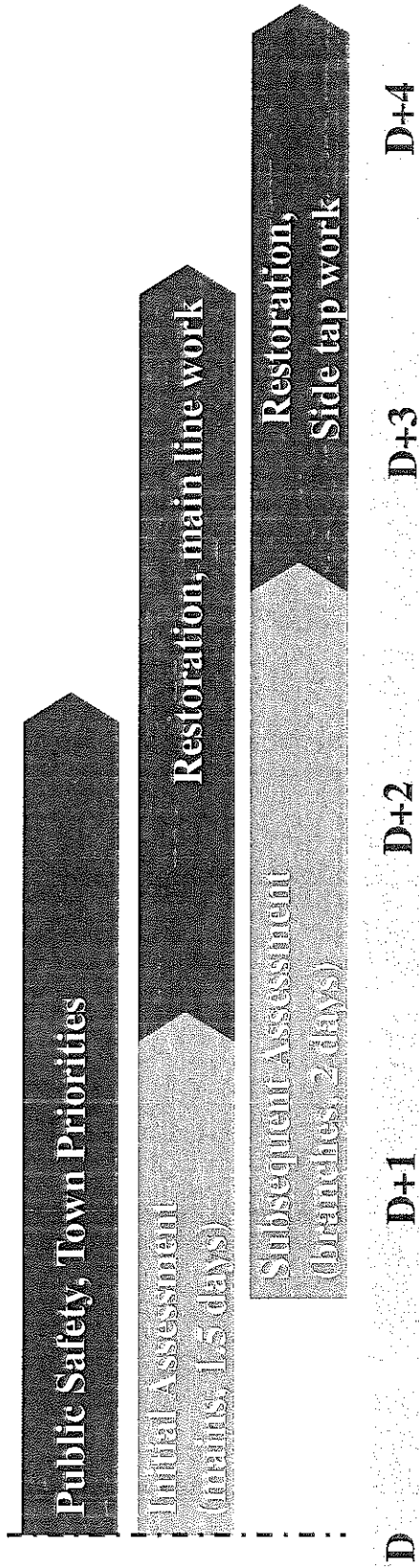
- Outages/damage concentrated at beginning
- Longer assessment phase early

For Alfred:

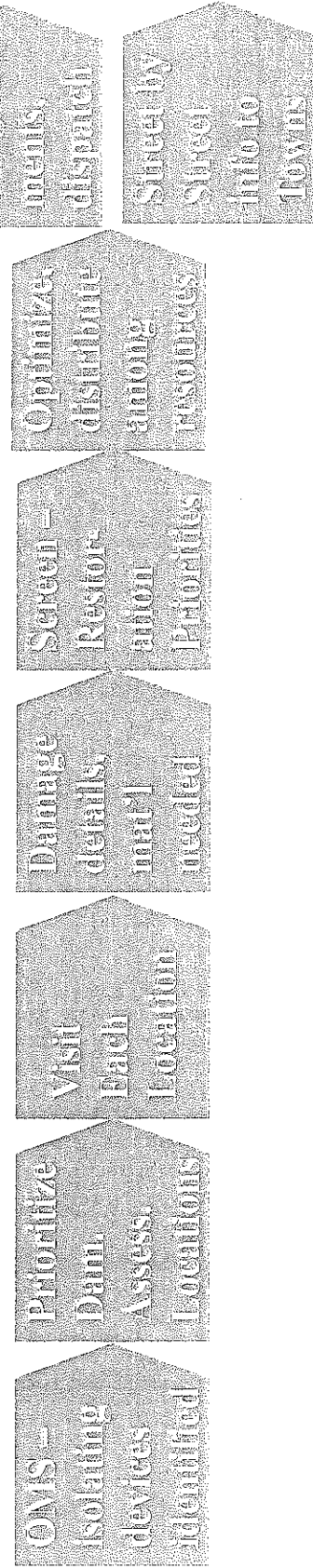
- Outages/damage spread across duration
- Repeated assessments, more overlap with restoration

Assessment must be performed up front ...

To enable rapid restoration; accurate restoration predictions, and efficient use of resources



Damage Assessment Process:



... then partially iterate as new information received, or if additional damage occurs

UI obtains outside resources via two means: (a) Mutual Assistance, and (b) leveraging existing Contractor Relationships:

Mutual Assistance Program Overview:

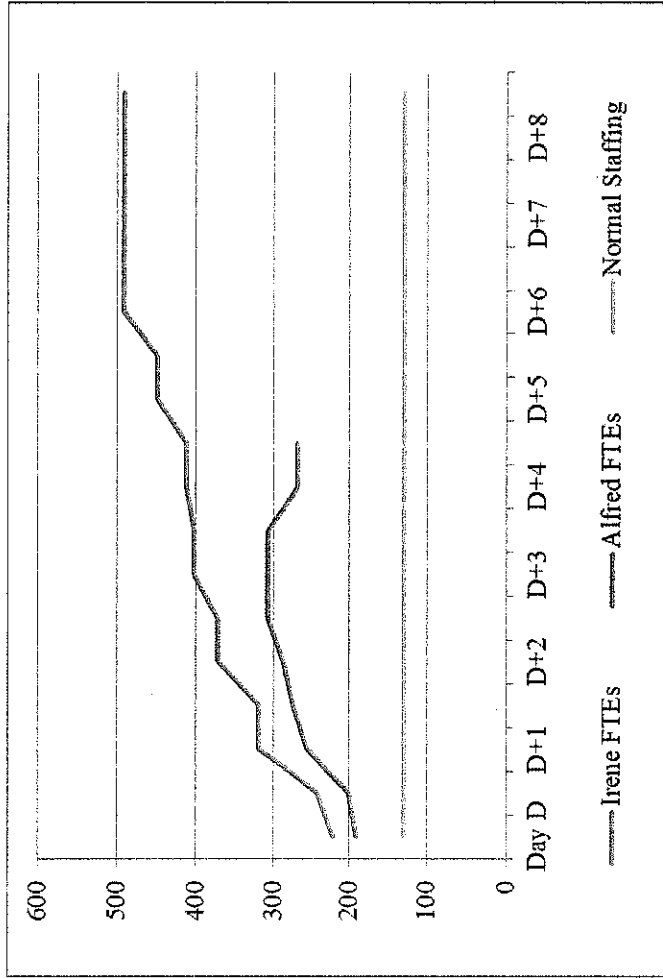
- Administered thru the Edison Electrical Institute (EEI).
- Three Levels: National (EEI), Regional Mutual Assistance Groups (RMAGs), Local (Utility)
- Affected utilities can “borrow” line workers from other utilities
- Responses are coordinated thru the RMAGs
- RMAG attempts to be “equitable” in allocation, assignments
- Requesting company agrees to reimburse all costs of assisting company

- *Program is intended to deal with actual emergencies/damage – not as a precautionary measure.*
- *Without pre-approval of recovery, decisions must be delayed.*
- *Recommend we advocate at national/EEI level, broadening the reach when region-wide events are likely.*

Examples of Assistance UI Received in Recent Storms:

- Thirau
- Albrite Electric
- Lewis Tree
- Pasquariello Electric
- Osmose
- Progress Energy
- Florida Power & Light
- Lumbee River, NC
- Warrensburgh, IL
- Asplundh, CT & OH
- Duke Energy, OH
- Westar Energy, KS
- Kansas City P&L
- Madison Gas & Electric
- Green Mountain Power

**Approximate Field Personnel,
Irene v. Alfred v. Normal:**



Includes Restoration (Line) Crews, Line Clearance (Tree) Crews, Service Crews, and Make-Safe Crews. Excludes Patroller, Wires-Down-Standby Crews, management, coordination, supervisory, administrative support for field functions.

- Even for Alfred, these field functions required ~ 400 management and other support FTEs involved in:
 - Coordination
 - Damage Assessment
 - Prioritization of Work
 - Assigning Work
 - Managing Field Forces
- These support resources may be approaching their upper limit managing the dramatic increase in field FTEs.
- Upper limit of these resources is unclear.
- Technology improvements may expand capability.

This issue will be studied further.

For UI, Irene and Alfred were different ...

Irene:

Storm Severity:

- 3-6" of rain
- Wind gusts > 60 mph
- Tidal Flooding

Damage:

- 263 circuits w/ outages
- 10,300 locations worked by crews
- 9,700 locations assessed for damage
- ~ 210,000 customers restored
- ~ 209,000 calls handled

Examples of Commodities Consumed:

- 84 Poles
- ~ 14,000 ft. of Primary Wire
- ~ 136,000 ft. of Secondary Wire
- 175 Transformers

Alfred:

Storm Severity:

- 3-5" of snow + leaves still on trees
- Wind gusts > 35 mph
- No Flooding

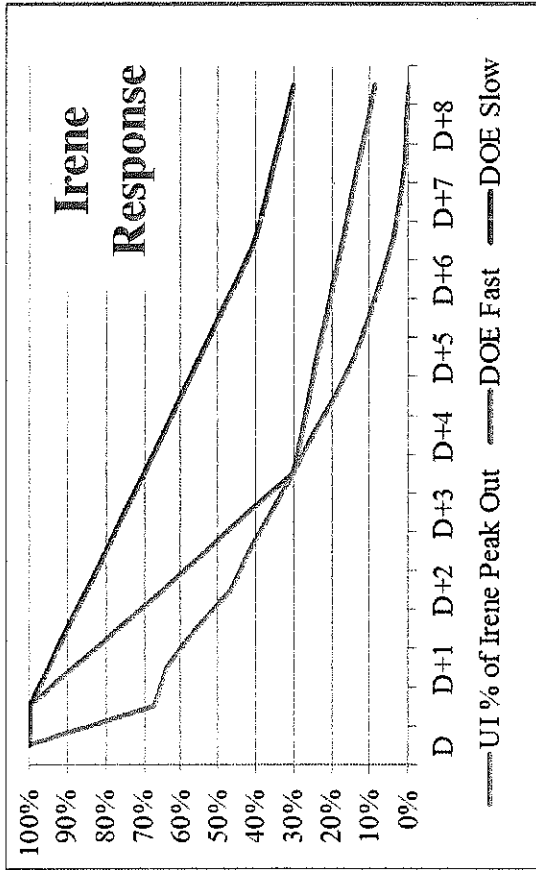
Damage:

- 186 circuits w/ outages
- ~ 2,000 locations worked by crews
- TBD locations visited to assess damage
- ~ 52,000 customers restored
- ~ 59,000 calls handled

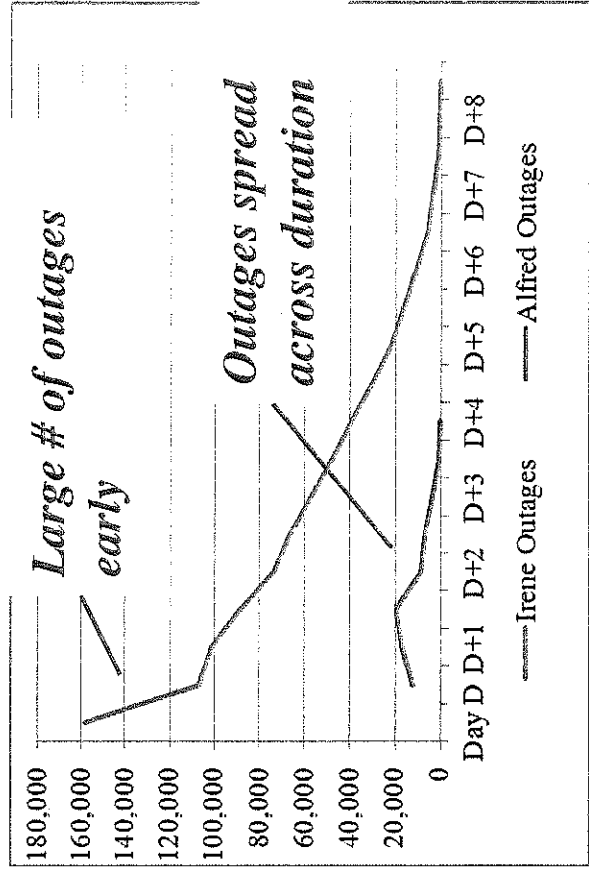
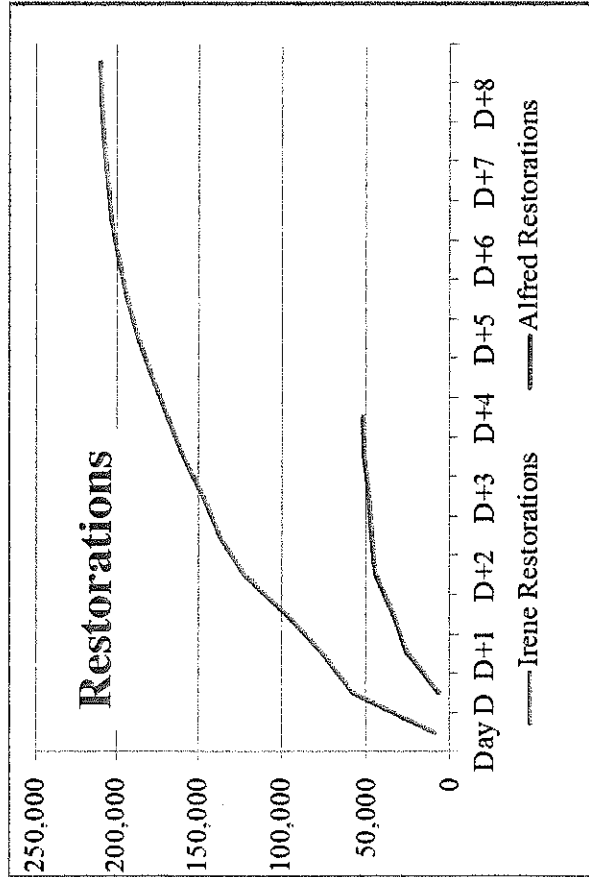
Examples of Commodities Consumed:

- 30 Poles
- ~ 700 ft. of Primary Wire
 - Many sleeves, splices
- ~ 5,700 ft. of Secondary Wire
- 45 Transformers

Restoration – Irene v. Alfred



- Metric:** Irene: Alfred:
- Restorations: ~ 210,000 ~ 52,000
 - Peak Outages: ~ 158,000* ~ 20,000
 - Resto./Pk. Out.: 1.3x 2.6x
 - Outage Timing Concentrated Early
 - Duration Over
 - Full Restoration: 8 days 4 days



* Off-hour peak.

Communications expectations are rising – we'll respond.

Lessons Learned from Irene:

1. Reduced damage = faster restoration:
More aggressive tree management
2. Didn't always meet the information-expectations of customers, government
 - Need to continue to improve communication & coordination with towns.
 - Customers want individual address restoration estimates sooner.

Need to further develop processes for gathering, assessing, and conveying useful information.

3. Some technology-related weaknesses
4. See also Recommendations from Legislative Hearings (Six Categories).

Next Steps from Irene:

1. Conduct customer survey(s) **↑** **Done**
2. Meet with each of our towns/cities **↑** **Nearly Done**
3. Complete our after action assessment **↑** **Done**
4. Accelerate UI's technology implementation plans.

- For future event(s), at completion of the assessment phase, accelerate conversion of results/data to useful information and disseminate more rapidly.

**See
Next
Two
Slides**

Irene Lessons Utilized in Alfred

- Make-safe dedicated crews assigned to towns as requested.
 - Accelerating road clearing for emergency vehicles and improving coordination with town public work crews
- Communications with Towns improved.
 - Conference calls with Towns
 - Daily street by street crew assignments provided to towns.
 - Designated an operations engineer to interface with the municipal liaison storm coordinators at UI Storm Center (to provide information to UI's town liaisons)

Initiatives Underway

1. Best-Practice and Technology Enhancements (see next slide):
 - Dedicated team established.
 - RFI prepared, issued.
2. Communication, Coordination with Towns:
 - Finish post-Irene meetings
 - Conduct post-Alfred meetings if desired.
 - Develop standardized template for Town-bound information
3. Improved Coordination with Telecom/Cable:
 - Poles restoration coordination w/ ATT
 - Embedded telecom/cable in UI EOC

Ultimate Objectives: (1) restore faster, (2) maintain current safety, (3) provide earlier, accurate status & predictions to individual customers & government leaders.

	March 2010 Storm	Irene, Alfred (today)	Short-Term (< 1 yr)	Ult. Goal (1-3 yrs)
Best Practices				
Use of Incident Command System*	✓	✓	✓	✓
Pessimistic Storm Damage Predictions*	✓	✓	✓	✓
State & Municipal Communications Plan*		✓	✓	✓
Rapid Determination of Global Restor. Times*	✓	✓	✓	✓
Optimal Restoration Strategy	✓	✓	✓	✓
Consistent & Correct Communications*	✓	✓	✓	✓
Enabling Technologies				
OMS & Call Center Upgrade & Integration	✓	✓	✓	✓
Mobility in Trucks			✓	✓
Extend Two-Way Meter Deployment		✓	✓	✓
External Outage Reporting Tools		✓	✓	✓
Technology Enabled Damage Assessment				✓

* Recommendations from Oct. 2010 Jacobs Rpt. to DPUC ✓ = Partially Implemented, or enhancements desired. ✓ = Fully Implemented.

1. Reduce the environment's ability to do damage:

- Develop state-wide trim standard
- More aggressive tree removal program
- Impose "right tree, right location" regimen
- Enhanced tree trimming programs

2. Enhance the ability to withstand damage ("hardening"):

- More / selective undergrounding*
- Work with Towns – identify "critical circuits"
- Feed substations from different directions in lieu of double circuit?
- Interconnect more branches (more circuit ties)?
- Design future assets to higher standards (beyond Nat. Elec. Safety Code)?

3. More rapid recovery

- For extreme events, de-energize whole circuits – rapidly make-safe and clear roads, then re-energize?
- Strategically de-energize circuits (temporarily affecting customers who wouldn't otherwise be out)?

4. State-Wide Initiatives

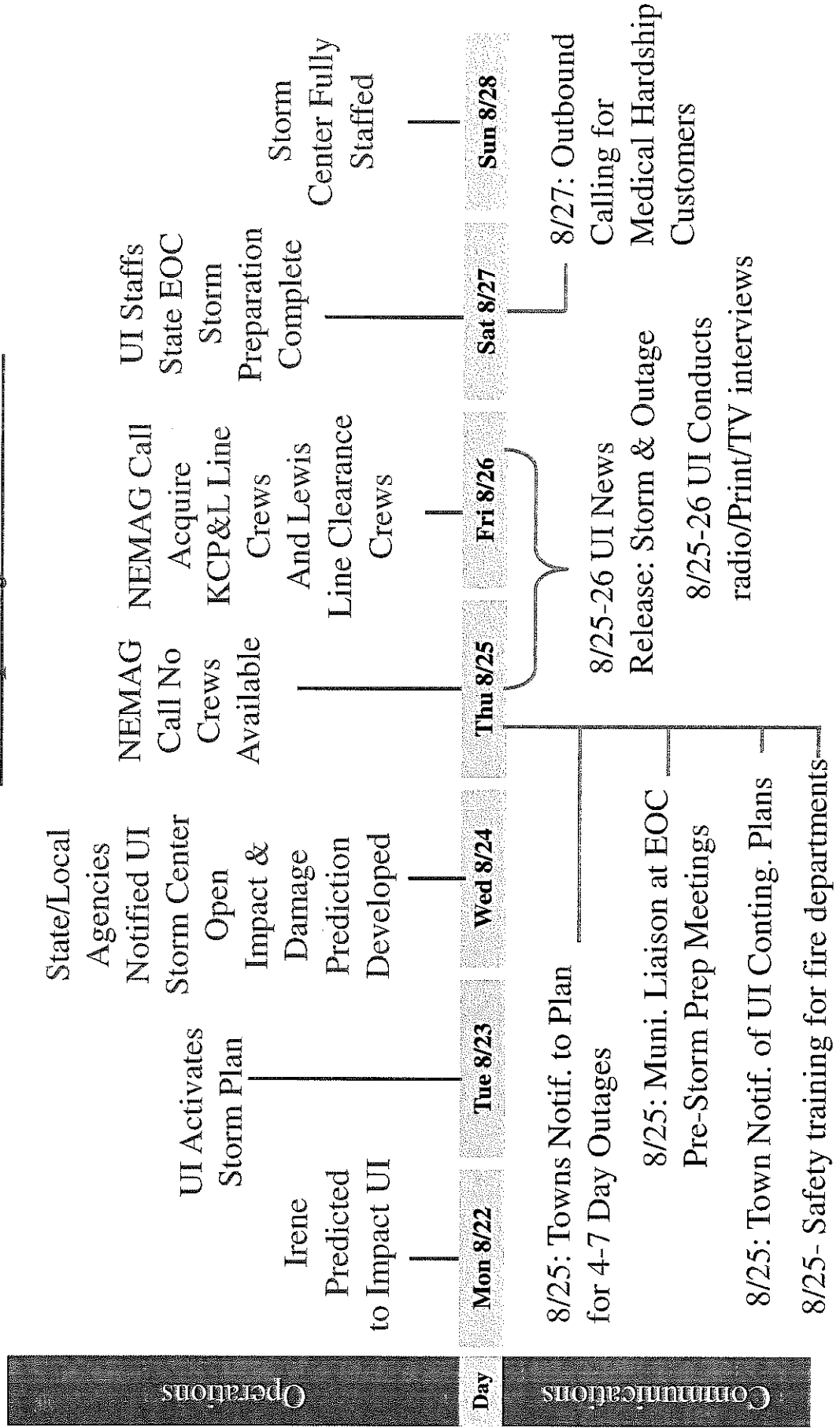
- State-wide exercises
- Quicker utilization of National Guard to assist in road clearing

Some of these may prove impractical / uneconomical, but should at least be considered for further study.

*Various studies both in CT and elsewhere indicate that wide-scale undergrounding is not practical / economical in most environments.

Appendices

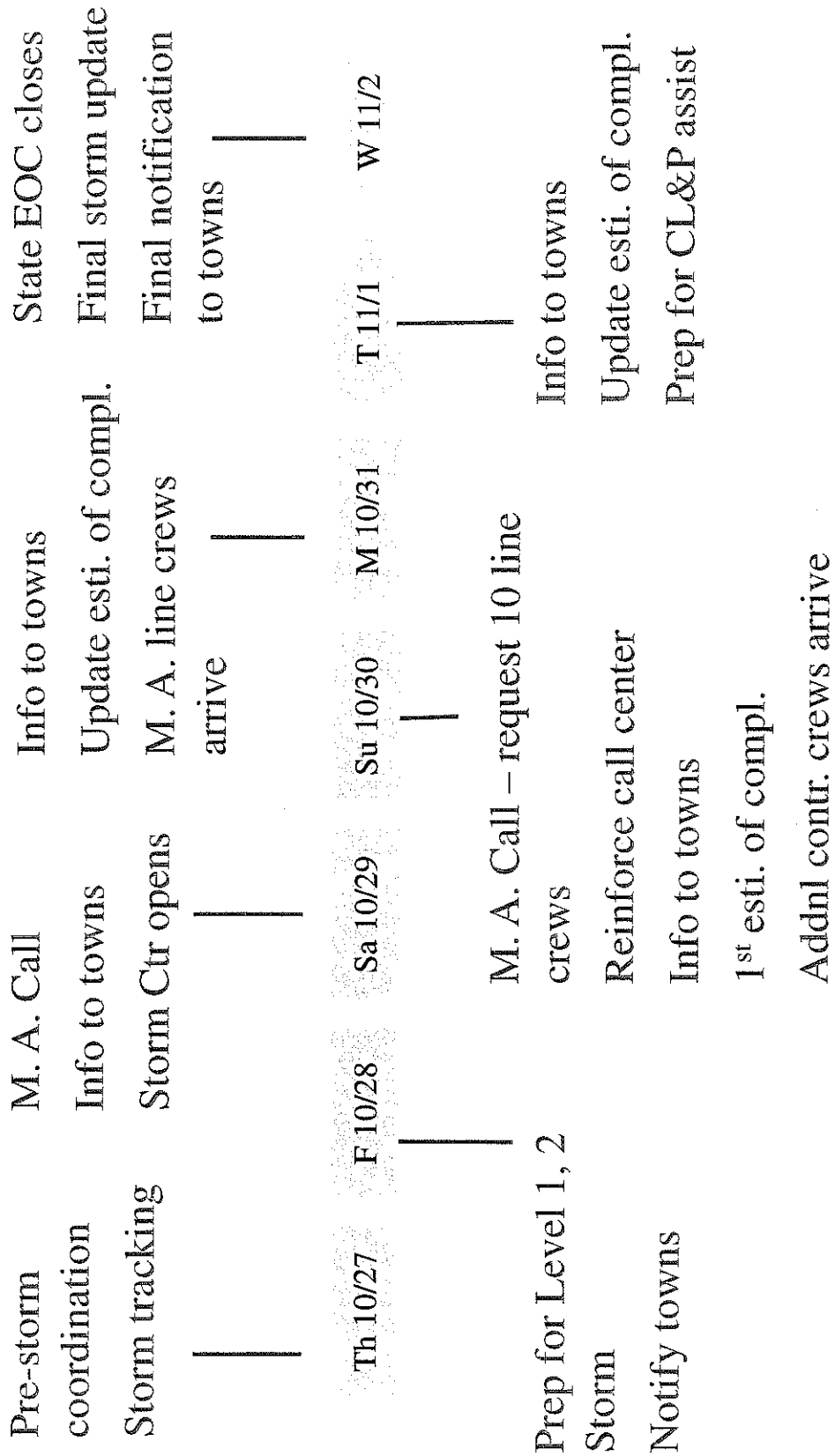
*We begin planning many days before the storm ...
 here are some examples from Irene:*





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High Level Alfred Timeline – Examples of Events





**Connecticut
Light & Power**

A Northeast Utilities Company



November 15, 2011

Testimony of William J. Quinlan
Vice President of Customer Solutions
The Connecticut Light and Power Company

My name is William J. Quinlan, and I am the Vice President of Customer Solutions for The Connecticut Light and Power Company (CL&P). CL&P appreciates the opportunity to appear before this panel and to participate in the review of the recent storms that have impacted Connecticut.

The last 60 days have been an unprecedented period of time for our customers, our company and our employees. As many of you experienced first-hand with Tropical Storm Irene and the October Nor'easter, these historic storms caused widespread damage that impacted the lives of our customers and literally changed the landscape of the communities in which we live and work. The latest storm marks the second time in eight weeks where we restored outages affecting approximately one million of our customers.

The unprecedented October snowstorm was especially challenging, because we had relatively little time to prepare. The heavy, wet nature of the snow combined with the fact that many trees still retained their leaves due to the unusually late leaf drop, caused damage to our infrastructure that we have never seen before. At its peak, we lost service to more than 830,000 customers, the highest number in CL&P's over 100-year history, across every one of the 149 towns and cities that we serve. Further complicating the

situation were outages affecting 32 transmission lines and 20 transmission substations in Connecticut that needed to be re-energized before we could restore service to our customers.

For Tropical Storm Irene where we had more time to prepare, we were able to secure significant outside resources prior to the storm making landfall. In response to the October storm, we were ultimately successful in bringing in over 1,800 line crews, almost 900 tree crews and 250 service crews to supplement our workforce. This is almost 10 times our normal workforce, an increase that presented a significant logistical and managerial challenge.

In addition to the crews working in the field, we had thousands of NU corporate employees serving as wires down guards, patrolling circuits, coordinating food, lodging and the distribution of materials and fuel, and acting as liaisons with the towns and cities in our service territory. Overall, our approximately 10,000 employees and contractors performed well under difficult circumstances and I want to thank them for their hard work and dedication to our customers.

As with most large-scale undertakings, there are opportunities for improving future performance. In fact, we were still in the process of digesting the lessons learned from Tropical Storm Irene, when the October storm hit. In the aftermath of the first event, I was tasked with a special assignment to pursue opportunities for strengthening our communications and coordination with the municipalities that we serve. In collaboration

with the Connecticut Conference of Municipalities (CCM), we have been exploring ways to build stronger partnerships during storm restoration efforts. We will soon publish our comprehensive lessons learned analysis and, in many areas, the findings will be similar for the October Nor'easter. Even though we are still finalizing our "lessons learned" report, there are many changes that we are already implementing.

For example, we have taken several steps to improve communications with municipal leaders, including the delivery of additional training and technology to our town liaisons. There were many municipalities where officials were pleased with their interaction with CL&P and the level of information that they received. We also understand that there were instances where our town liaisons were not armed with sufficient or accurate information and that impeded our goal of effective communications with our towns and customers. Looking ahead, there are several additional initiatives that we are pursuing to deliver a consistently excellent level of communication to municipal leaders. These will include the pursuit of a common understanding with the towns and our customers of the restoration process and expectations.

We made a concerted effort during this storm to have our crews work with the towns to help clear roads where our lines were entangled with damaged trees. In the future, it is essential that we further increase the level of coordination with each municipality to efficiently complete both the critical road-clearing and damage assessment activities. Building these partnerships will accelerate the 'make-safe' process and allow power restoration to begin earlier.

This storm also clearly reinforced what we learned from Tropical Storm Irene with regard to the need for a statewide tree policy and improvements to the mutual aid process among utilities. Additionally, the event highlighted the importance of pursuing storm hardening of our critical infrastructure in consultation with the state and municipalities.

As with all storms, we will conduct our own internal review of how we can improve following the October Nor'easter. Additionally, we have hired a third-party firm, Davies Consulting, Inc., to undertake a comprehensive review of the company's preparedness and response to the event. This assessment will continue the examination of the utility response that is currently under way by Witt Associates. We will also continue to cooperate fully with this Two Storm Panel, with the ongoing legislative review and with the Public Utilities Regulatory Authority's review of these two events. As we examine our performance in response to the challenges posed by these two extreme weather events, we look forward to developing insights and solutions that will better prepare us for the future.

In conclusion, I would like to thank the many municipal leaders who worked with us to address public health and safety issues and to restore service to our customers. We recognize the significant hardship endured by our customers and will implement the changes necessary to improve our state's preparedness and performance when the next severe weather event hits Connecticut.

Next, you will hear from Mike Ahern, Vice President of Utility Services for Northeast Utilities who will discuss our storm preparation, Bob Hybsch, Vice President of Customer Operations for CL&P who will discuss our restoration performance and lessons learned, and Dana Louth, Vice President of Asset Strategy for Northeast Utilities who will discuss infrastructure hardening. We are also joined by Dave Boguslawski, Vice President of Transmission for Northeast Utilities.

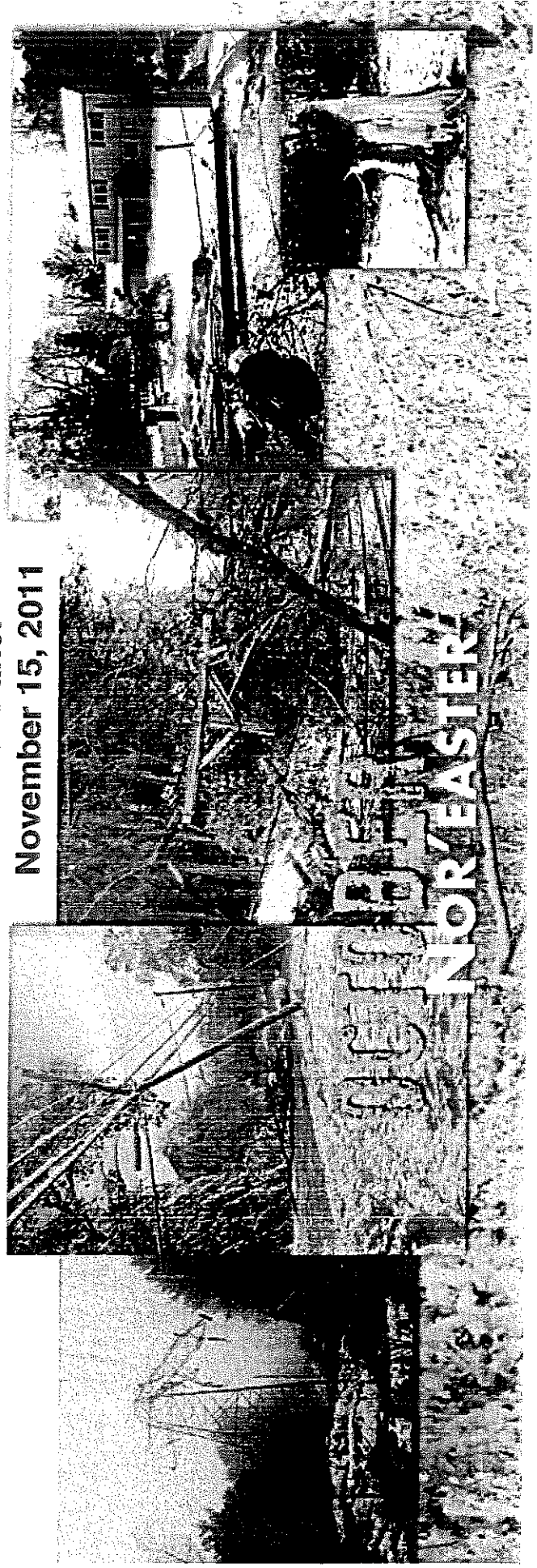
Thank you for your time and attention.



Governor's Two-Storm Panel: Tropical Storm Irene and the October Nor'easter

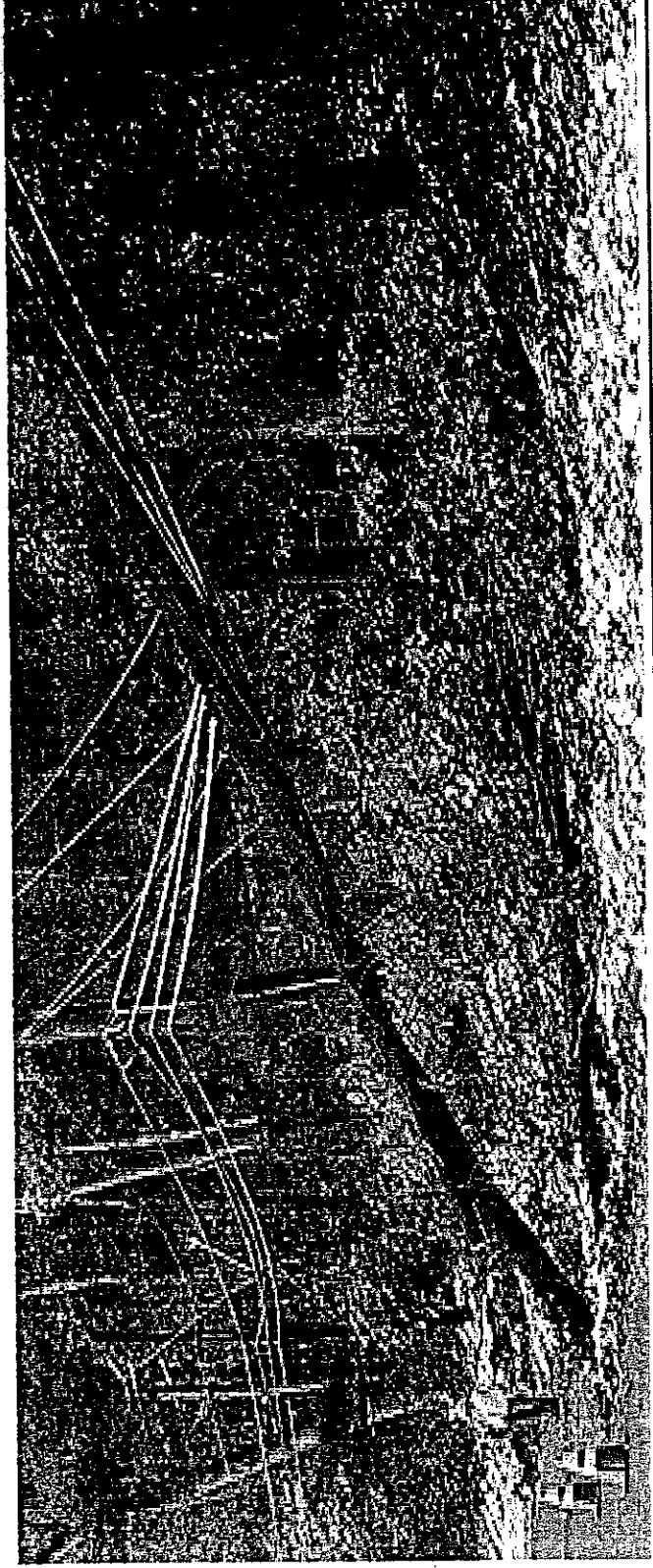
CL&P Panel

November 15, 2011



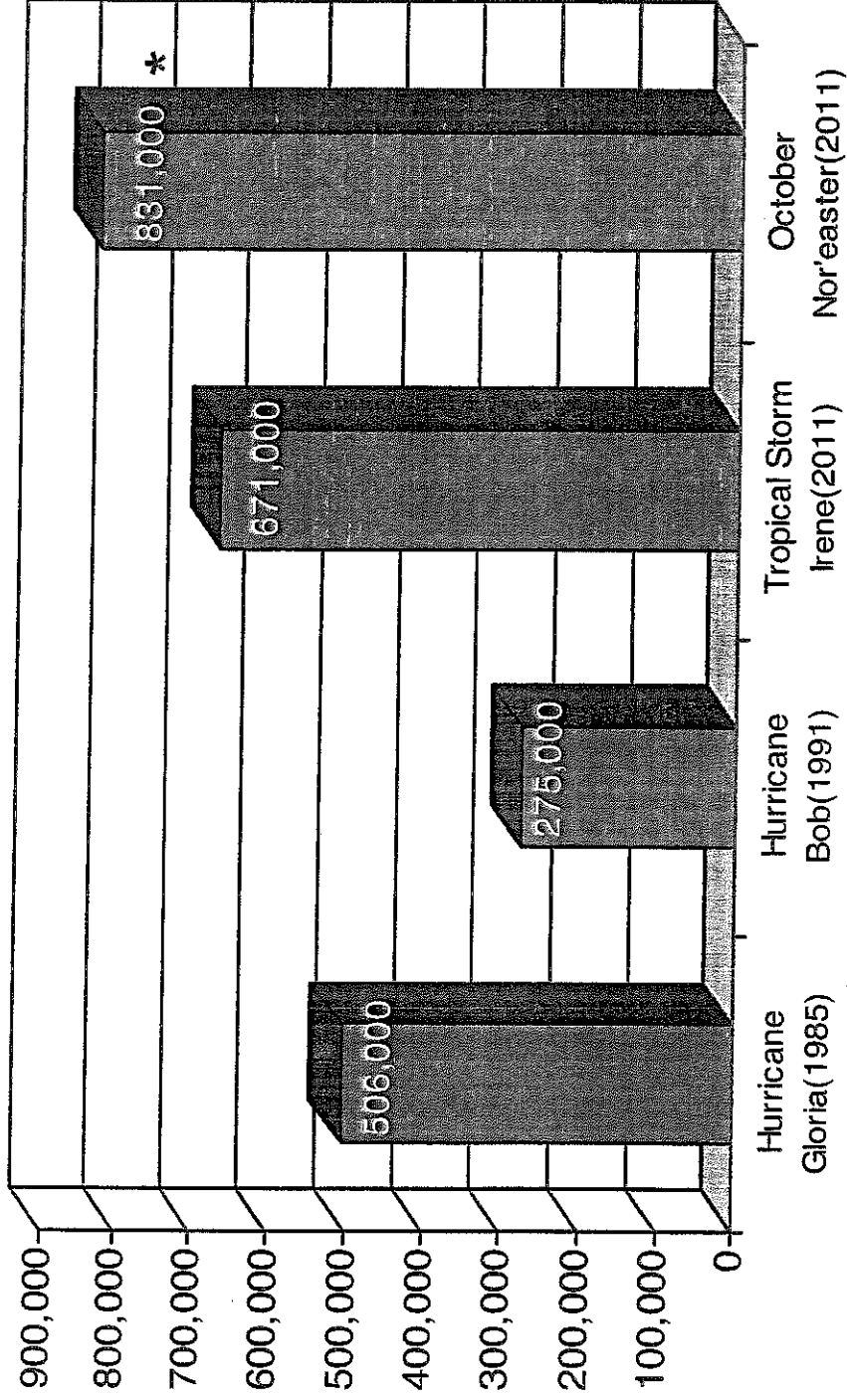
Overview

■ Introduction	Bill Quinlan	CL&P Vice President - Customer Solutions
■ Storm Preparation	Mike Ahern	NU Vice President - Utility Services
■ Transmission Impacts	Dave Boguslawski	NU Vice President - Transmission
■ Restoration Performance	Bob Hybsch	CL&P Vice President - Customer Operations
■ Lessons Learned	Bob Hybsch	CL&P Vice President - Customer Operations
■ Infrastructure Hardening	Dana Louth	NU Vice President - Asset Strategy



Recent Unprecedented Weather Events Have Significantly Impacted Our Customers, Our Company and the State of Connecticut

Peak Impact - Customers Out



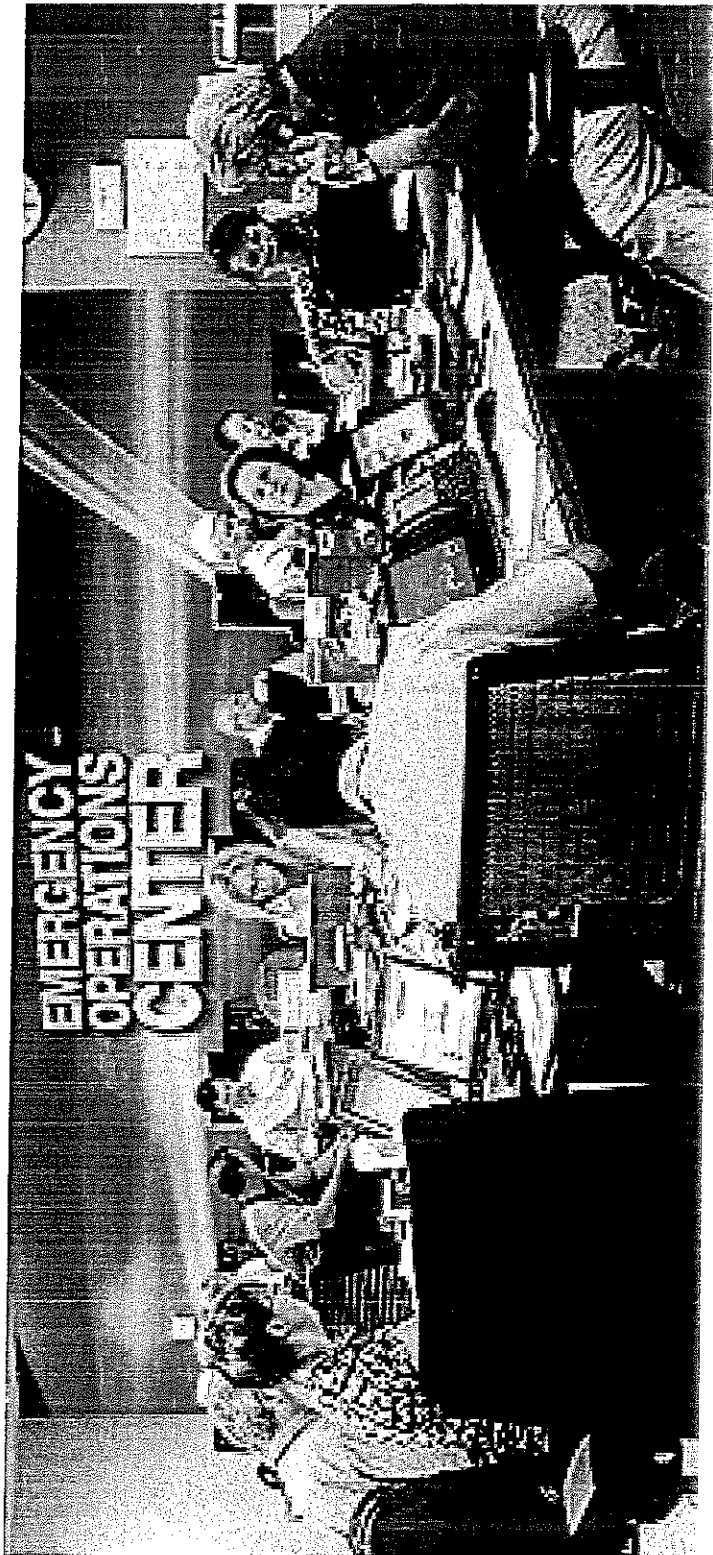
* Estimated Customers Out At Peak

CL&P is Committed to Working With the State and Municipalities to Better Prepare Connecticut for Severe Weather Events

There are several reviews under way that will help identify actions to mitigate the future impacts of severe weather:

- Governor's Two-Storm Panel review
- Internal post-storm critiques and regional municipal forums
- Connecticut legislative hearings
- Review undertaken by Witt Associates
- Examination conducted by Davies Consulting
- Public Utility Regulatory Authority (PURA) review

Emergency Preparedness and Mutual Aid – Mike Ahern



NU's Corporate Incident Response Plan Was Ready and Effectively Deployed

- NU uses a corporate level "All Hazards" Incident Response Plan:
 - Based on elements from the National Incident Management System (NIMS)
 - Response procedures, including communications protocols and reporting
 - A clearly defined incident command structure
 - Each NU electric distribution company has detailed (NIMS-based) emergency plans

- Daily storm preparation and restoration meetings include:
 - Safety
 - Weather forecasts
 - Crew availability and allocation
 - Support availability and allocation
 - Customer experience issues
 - Communications and resource matters
 - Restoration progress and any related issues

Widespread Regional Storms Cause Shortages in Available Line Crews

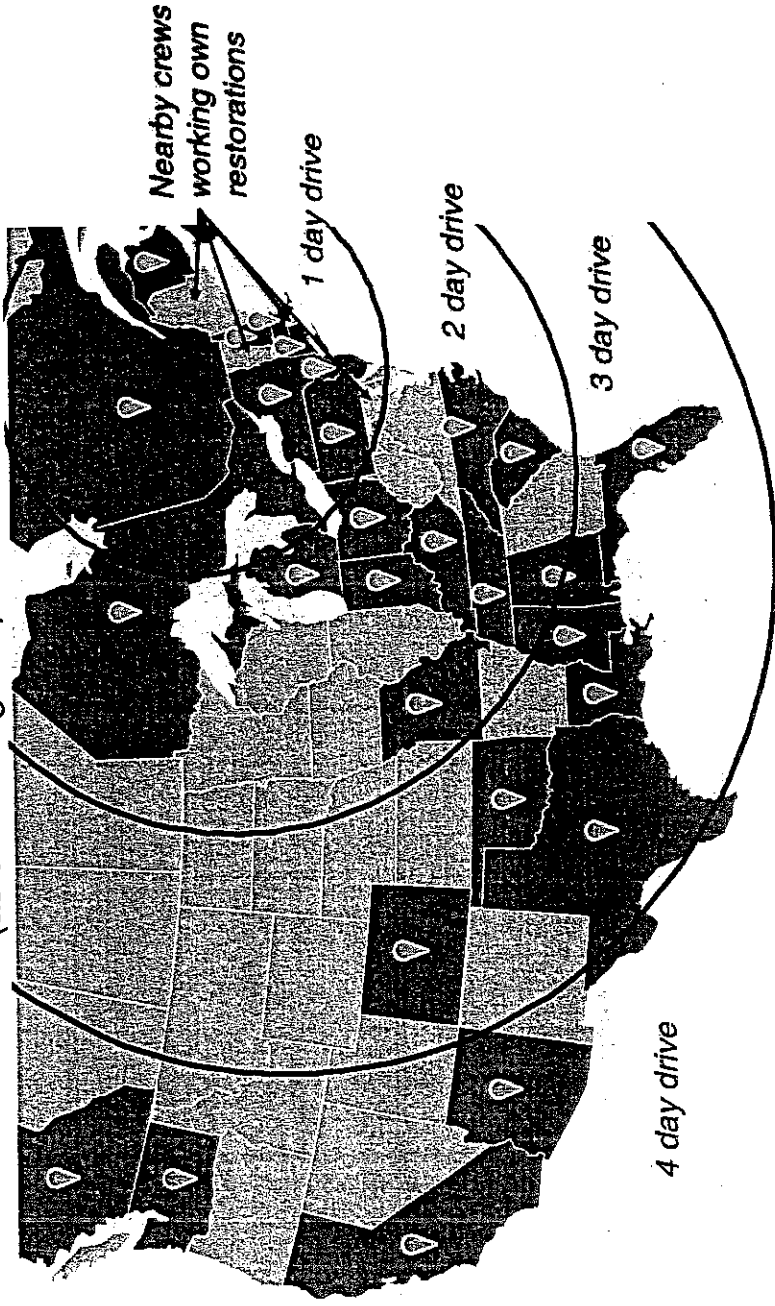
- Electric distribution companies depend on mutual aid and outside assistance to restore power following major storms
 - We secure resources by:
 - Directly hiring contract firms
 - Mutual assistance from other utilities
- Mutual Aid Groups and Contractor Alliances facilitate resource acquisition:
 - NU is a member of both the New York and the Northeast Regional Mutual Aid Groups
 - NU has an alliance with Quanta Services for line crews
 - NU has alliances with Asplundh and Lewis for tree crews
- The peak **unmet** demand for line crews during the Nor'easter was more than double that of Irene

Peak <u>Unmet</u> Line Crew Demand		
	<u>Irene</u>	<u>Nor'easter</u>
NEMAG	1467	3505
NYMAG	900	1875
Total	2367	5380

For Widespread Regional Storms, Many of the First Crews to Assist Must Travel 2-3 Days

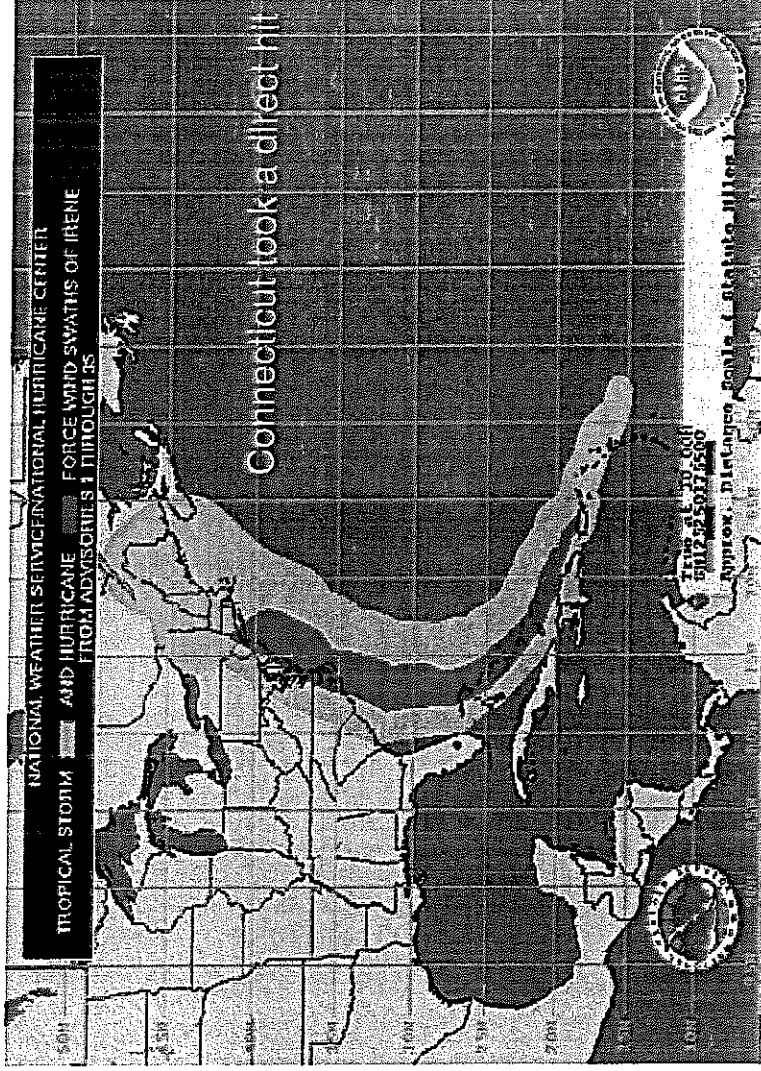
- When the local demand for line crews is greater than the supply, NU reaches out across North America to obtain as many line crews as needed

For Storm Irene, crews came from 24 states and Canada (as shown in green)



- Arrival times vary depending on the distance travelled
- Travel delays add to the overall restoration duration
- Additional nearby crews become available as they complete their own restorations

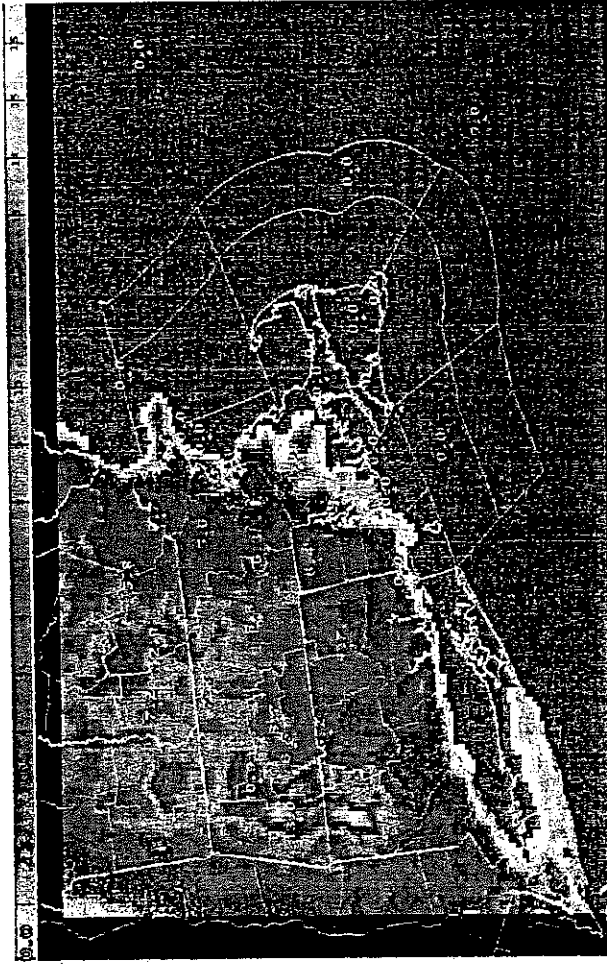
Early, Accurate Forecasting Shaped Our Planning and Preparation for Tropical Storm Irene



- We began hiring outside contractors four days before the storm hit
- The higher wind speed, more damaging eastern side of Storm Irene ran over Long Island and eastern Connecticut
- In both of these areas, full restoration took 9 days

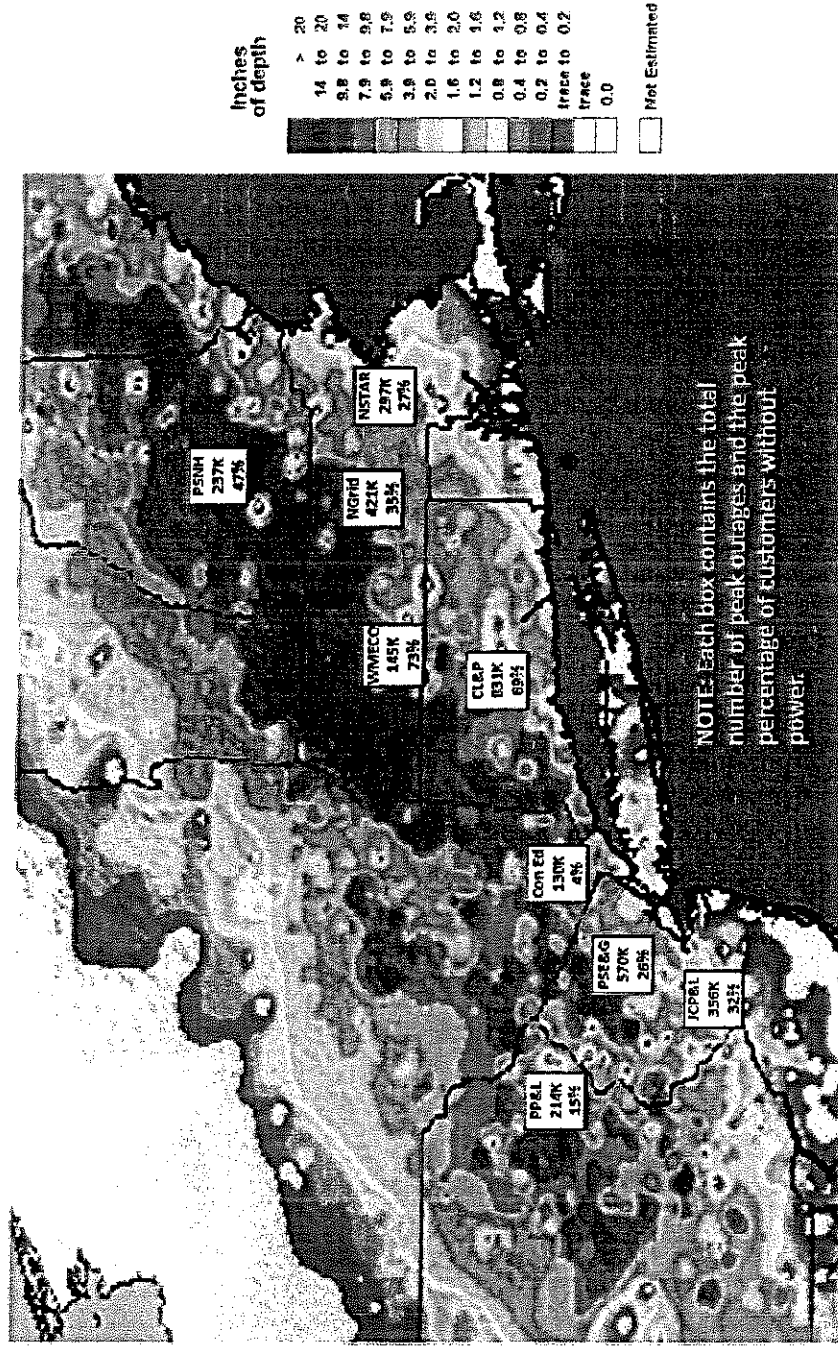
The October Nor'easter Forecast Changed Between Thursday and Saturday

- Early Thursday, October 27, forecast was for 2-4 inches of light accumulation across the northeast
- Friday morning forecasts predicted 4-8 inches of wet snowfall in northern Connecticut and 2-4 inches over the center of the state
- By Friday afternoon, snowfall predictions rose to 8-12 inches across northern Connecticut and 3-8 inches in central areas
- Saturday morning's forecast reaffirmed Friday afternoon's predictions
- The Nor'easter hit midday Saturday

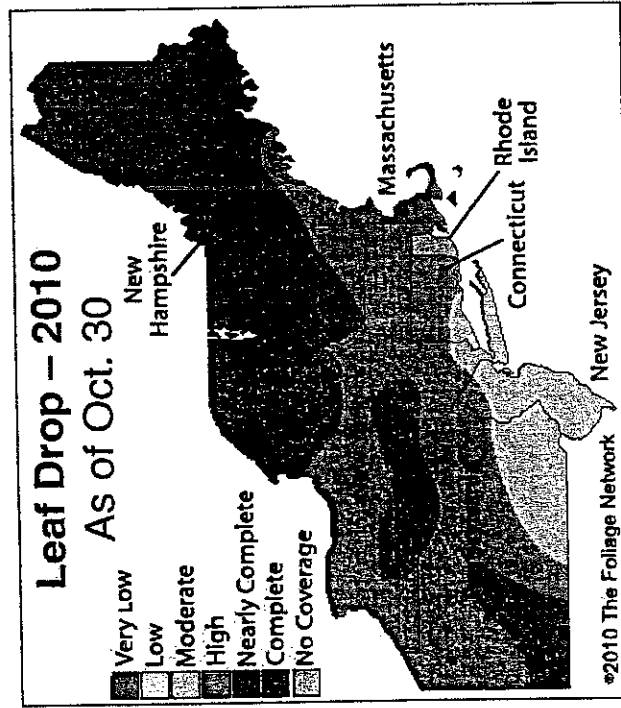
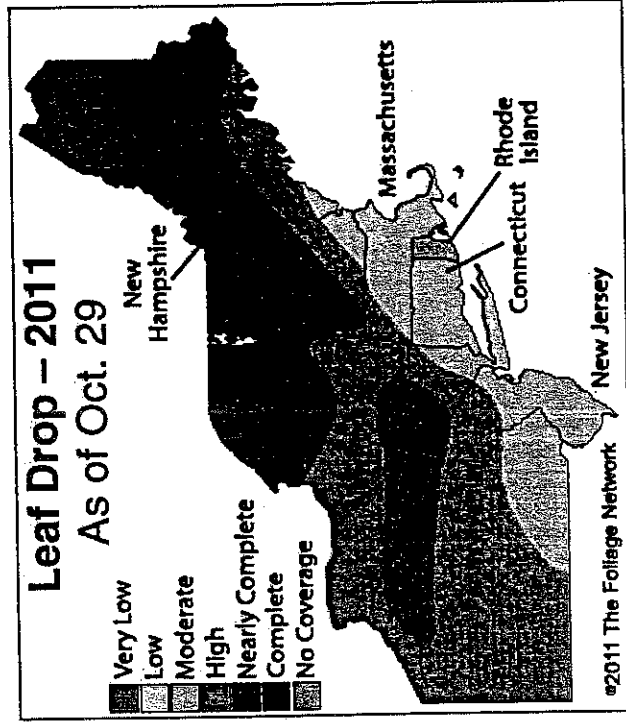


The October Nor'easter – Actual Snowfall Significantly Exceeded Friday's Forecast

- The October Nor'easter hit Connecticut hard
- The heavy, wet snow combined with the trees and their leaves to produce the highest total customer outages in CL&P's history



Late Leaf Drop Exacerbated the Impact of Record Snowfall



We Responded to Both Storms and Acquired Significantly More Resources

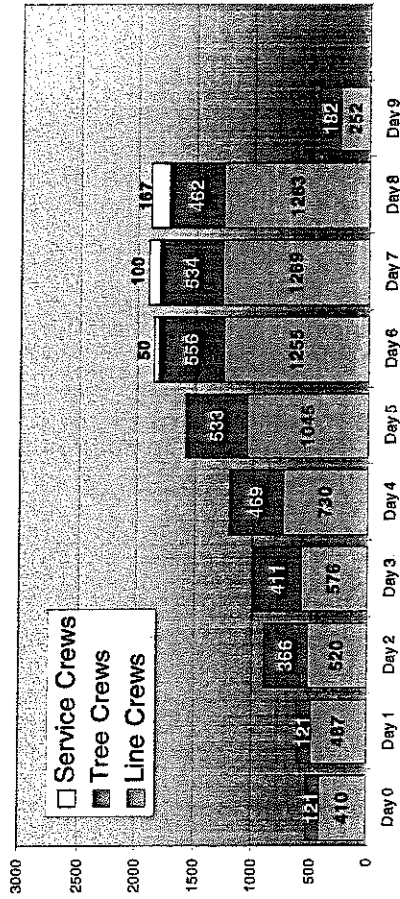
Tropical Storm Irene – began hiring contractor line crews 4 days in advance. Continued to hire throughout the restoration.

October Nor'easter – began hiring contractor line crews 1 day before impact. Continued to hire throughout the restoration.

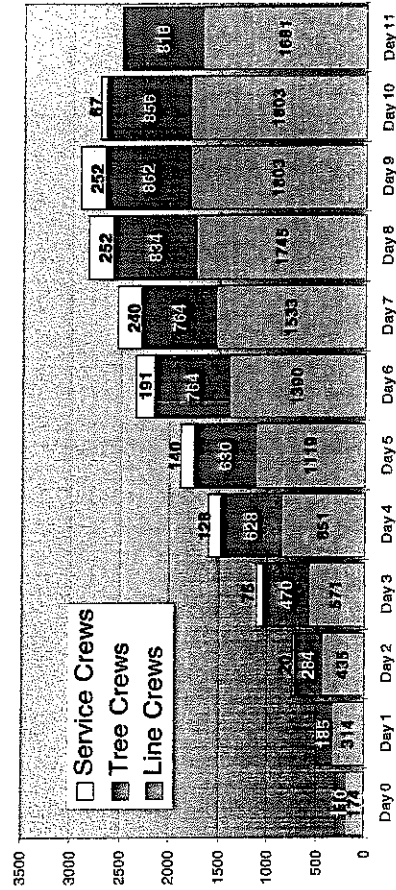
On the New York Mutual Aid Group's conference call - the morning of the storm (Saturday) - no utilities requested additional crews. By that evening, NU and others were requesting hundreds of crews and we were all hiring directly.

By Day 3, we had secured more crews than at the same point during Irene.

Storm Irene - CL&P Total Crews Working by Day *

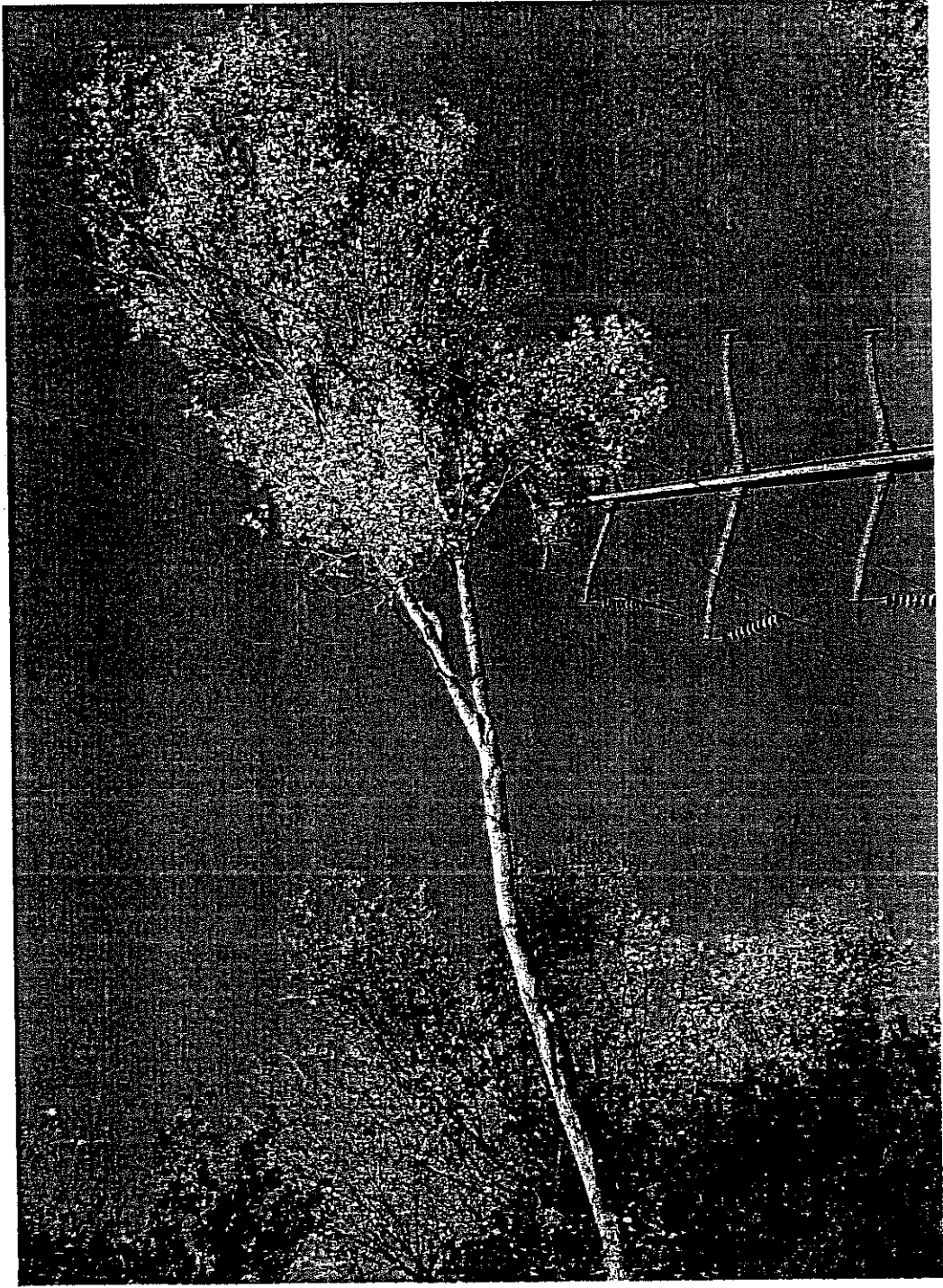


October Nor'easter - CL&P Total Crews Working by Day *



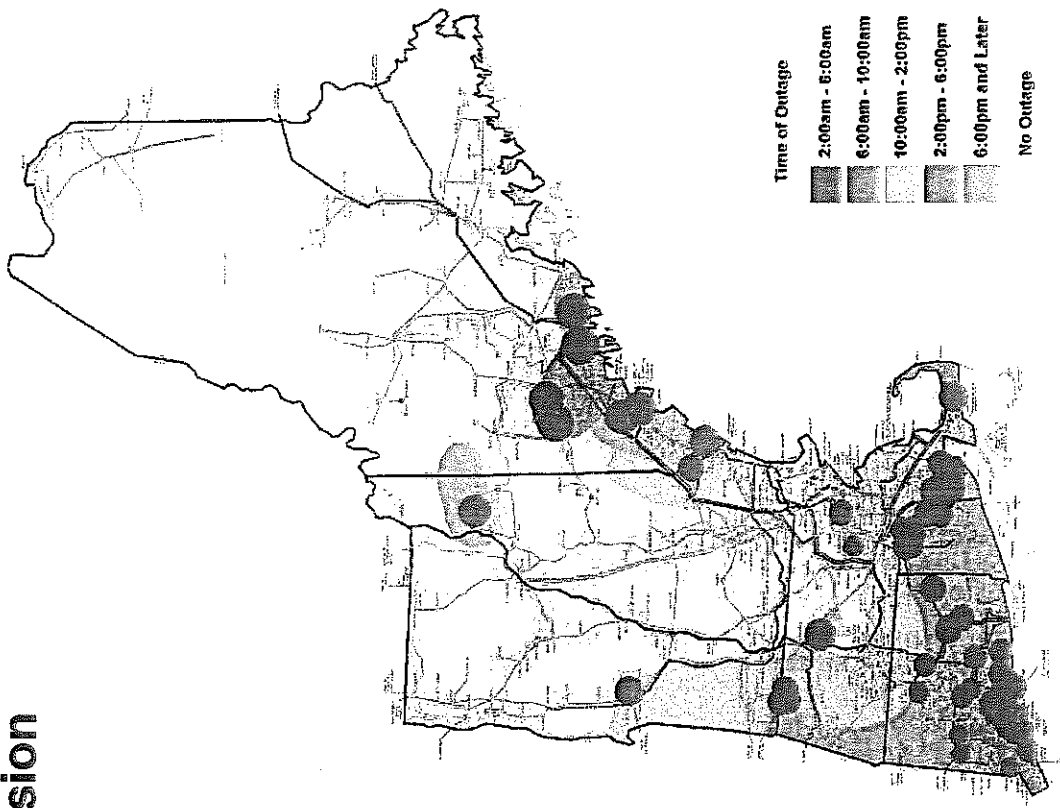
* Estimated

Transmission Impacts – Dave Boguslawski



Tropical Storm Irene's Impact on Transmission

- Heaviest August 28 damage caused by trees in highest wind areas
- 44 New England transmission line outages
- 21 Connecticut line outages
 - Three outages affected 18,200 customers
 - Lines affecting customers were back in service on August 29
 - 18 line outages having no customer impact were back by end of day, August 30 – two days after storm hit
 - No 345 kV lines were affected

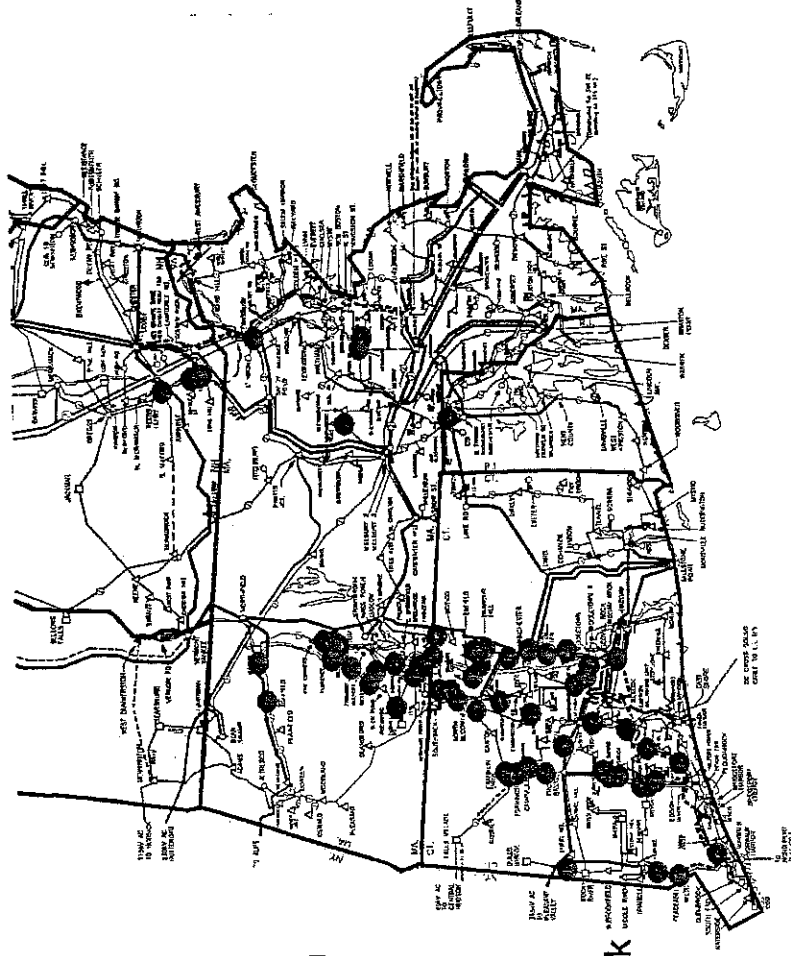


● Transmission Line Outage

Source: ISO - New England

October Nor'easter's Impact on Transmission

- Heaviest damage caused by trees Oct. 29-30, in CT River Valley
- 54 New England transmission line outages
- 32 Connecticut line outages
 - 20 substations which serve 167,000 customers were affected
 - Many of these customers had distribution line outages
 - Lines affecting 18 substations were back in service by Tuesday, Nov. 1
 - Remaining 2 substations back on Wednesday, Nov. 2
 - All other NU transmission lines were back in service by Sunday, Nov. 6



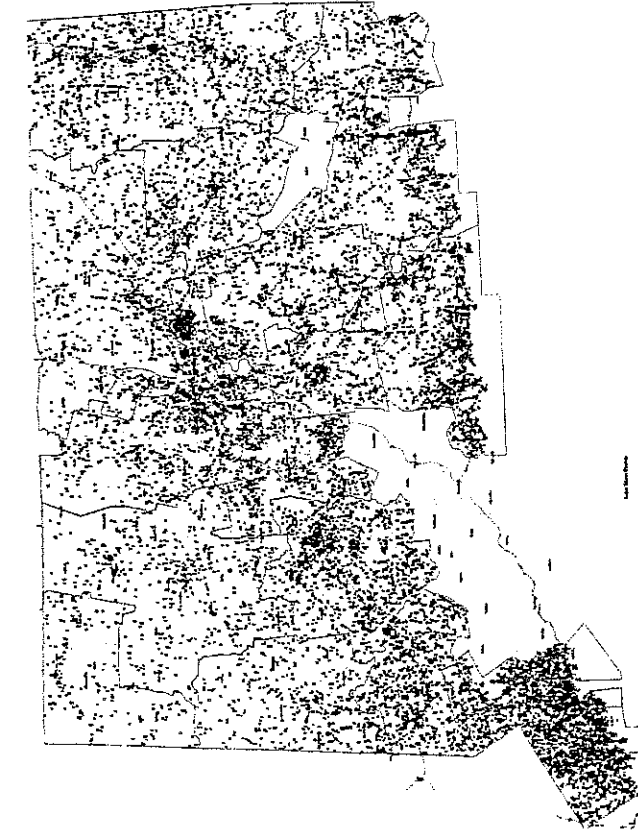
● Transmission Line Outage
Source: ISO - New England

Restoration Efforts – Bob Hybsch



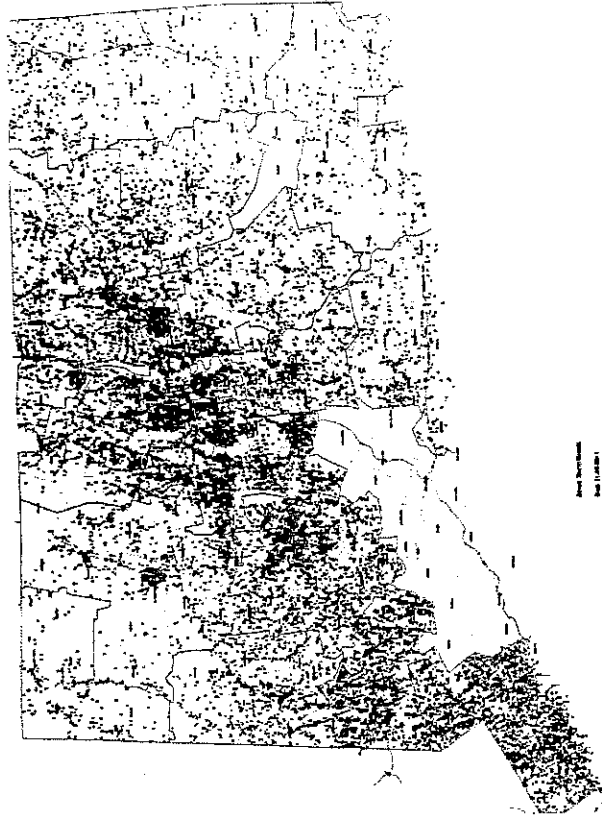
Both Storms Resulted in a Record Number of Trouble Spots Equivalent to Nearly Three Years Worth of Normal Restoration Work

IRENE TROUBLE SPOTS



- 16,101 Trouble spots repaired over 9 days
- Estimated 128,000 crew hours of restoration work
- Most significant damage experienced south of the I-84 corridor

OCTOBER NOR'EASTER TROUBLE SPOTS



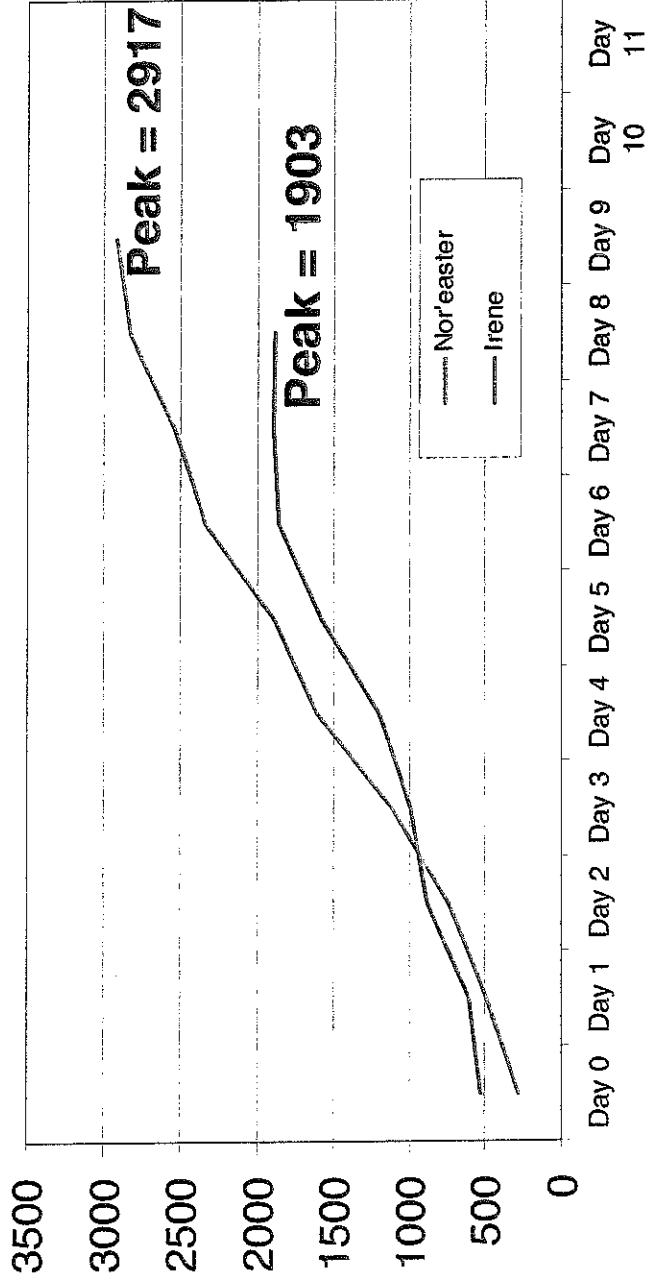
- ~25,500 Trouble spots (nearly 60% greater than Irene) repaired over 11 days
- Estimated 205,000 crew hours of restoration work
- Most significant damage experienced in north-central portion of state

On average, a crew repairs 2 trouble spots per 16 hour shift

CL&P Significantly Increased Its Workforce for Both Storms

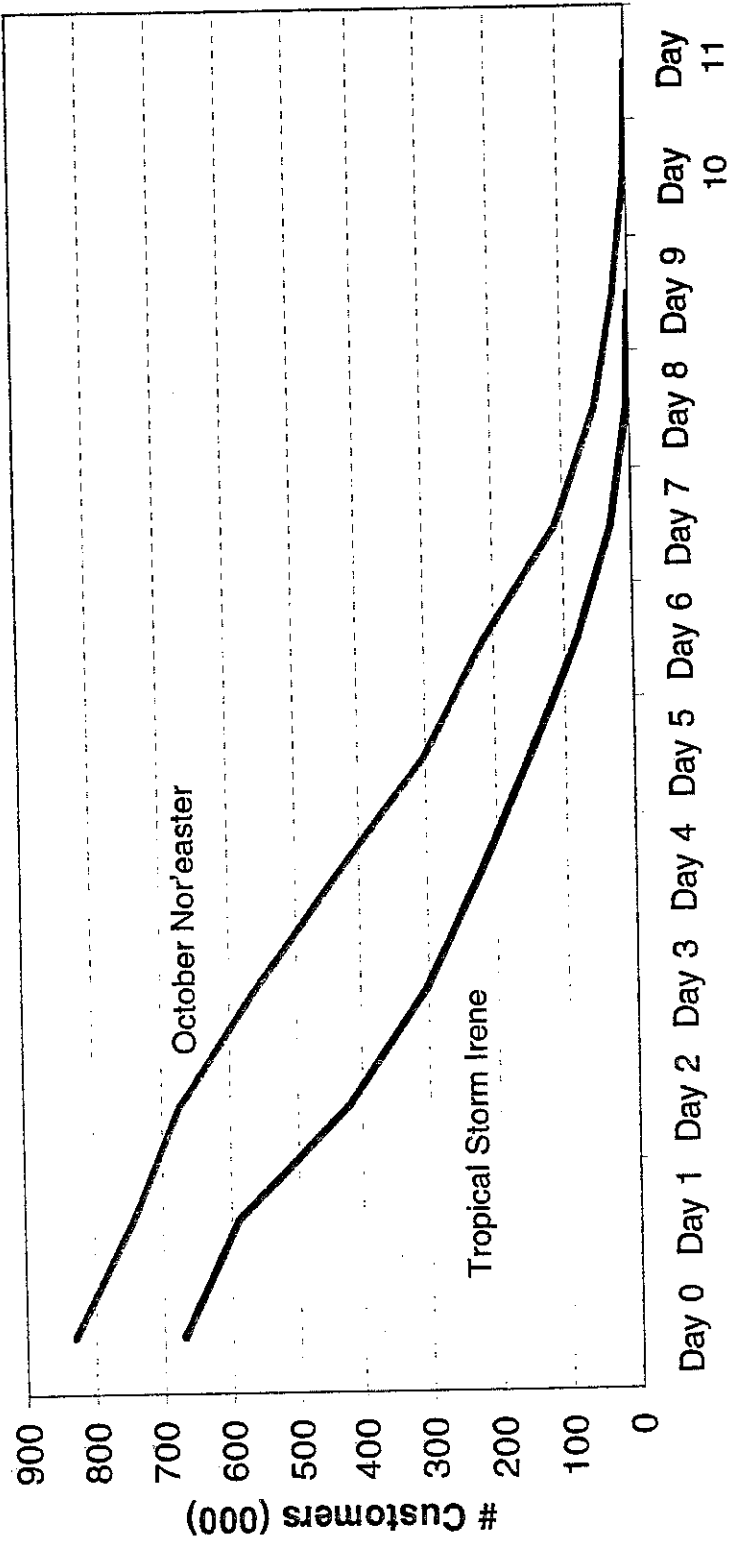
CL&P managed a workforce of 6 times normal complement for Tropical Storm Irene and 10 times normal complement for the October Nor'easter

CL&P Total Line, Tree & Service Crews



On Average, CL&P Restored 75,000 Customers Per Day During Both Storms

Restoration From Peak Customers Out



Days from peak customers out

Lessons Learned

- In the aftermath of Tropical Storm Irene, CL&P conducted a comprehensive critique.

 - Operations
 - > Develop and implement a strategy to accelerate the availability of additional line crews
 - > Work with towns to implement a consistent, statewide make-safe (road clearing) protocol
 - > Develop a comprehensive plan to better manage vegetation adjacent to public ways and utility infrastructure
 - > Initiate an industry dialogue on improving mutual aid processes
 - > Develop a tagging process to identify downed communications wires to the public
 - > Formalize a process to utilize outside local electricians to assist in the completion of service repairs for major restoration events

 - Communications
 - > Enhance town liaison training and technology
 - > Leverage town-detailed damage assessments
 - > Work with state and towns to conduct statewide mock full-scale readiness drills
-

Infrastructure Hardening – Dana Louth



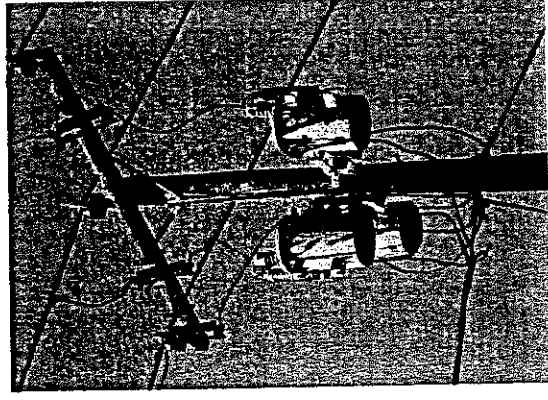
What is Infrastructure Hardening?

- A wide spectrum of definitions can be applied to the term “infrastructure hardening”
 - Infrastructure includes wires and poles
 - Hardening refers to making the system more resistant to weather events
- National Electric Safety Code (NESC) defines basic design parameters around which an electrical system is designed and built
- Infrastructure hardening goes beyond NESC criteria



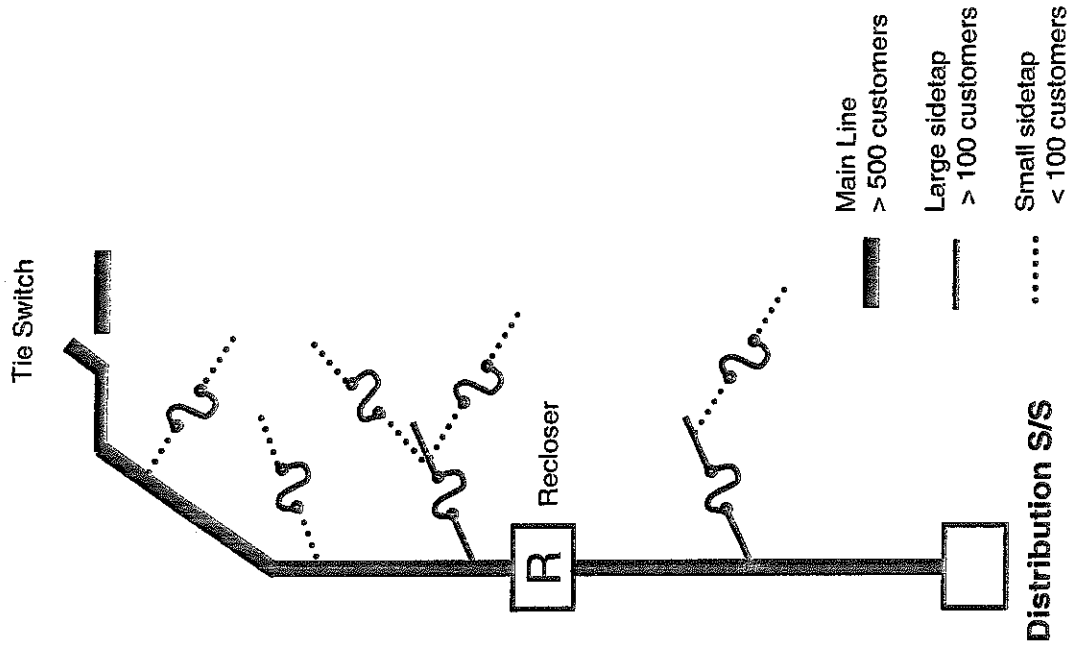
Infrastructure Hardening Techniques Fall Into Four General Categories

- **Vegetation Management**
 - Cycle – Frequency of trim
 - Clearance specifications
 - Risk tree removal
 - Incremental overhang removal
- **Structural Hardening**
 - Poles, cross arms, wire ties
 - Pole guying
 - Span length control
- **Electrical Hardening**
 - Wire size and type
 - Line sectionalizing
 - Lightning protection
- **Undergrounding**
 - Replace overhead conductors with underground
 - Requires replacement of some customer-owned equipment



Options for Applying Infrastructure Hardening Techniques

- System-wide
- Target circuits serving critical loads
 - Town EOCs, police and fire stations
 - Hospitals
 - Water treatment facilities
 - Shelters
- Target circuit segments serving large numbers of customers
 - > 100 customers
 - > 500 customers
- “Performance-based” circuit/circuit segment
- Selection of options for application of storm hardening techniques have important cost implications



Questions

10

D



**TESTIMONY OF HON. ROBIN STEIN
CHAIRMAN
CONNECTICUT SITING COUNCIL**

SUBMITTED TO THE JOINT STORM PANEL

NOVEMBER 15, 2011

Good morning members of the Storm Panel. My name is Robin Stein and I am the Chairman of the Connecticut Siting Council.

Thank you for this opportunity to provide comments and recommendations for a disaster recovery plan due to weather-related events that have an impact on energy and telecommunications infrastructure in our state, and particularly, our role in these crucial decisions.

Firstly, the Council has jurisdiction over the construction, maintenance and operation of cell towers. Cellular carriers and tower builders file an application with the Council for a certificate of environmental compatibility and public need. Council considerations concerning the approval of a cell tower application include, but are not limited to, backup power generation. Each carrier maintains their own standards as to the source of backup power generation and the length of time the backup power system will run in the event of an outage.

Based upon information included in Certificate applications and acquired at public hearings, carriers deploy backup generators that run on diesel fuel, propane, or batteries. Diesel-fueled and propane-fueled generators are typically capable of operating for 48 to 72 hours without being refueled. Battery powered backup generators can typically operate between 20 and 36 hours. One carrier has recently been installing 4 to 5 kilowatt fuel cells as a backup power source. These fuel cells operate on hydrogen gas and can operate up to 72 hours when all fuel cylinders are full.

Secondly, the Council has jurisdiction over the construction, maintenance and operation of electric substations and transmission lines with a design capacity of 69 kilovolts or more. Electric utility companies file an application with the Council for a certificate of

environmental compatibility and public need. Council considerations concerning the approval of transmission line and substation applications include, but are not limited to, safety and reliability information. Substation and transmission line construction is required to comply with the standards of the National Electrical Safety Code, which contains the minimum requirements for conductor spacing and height clearances.

The electric utility companies, in compliance with North American Electric Reliability Corporation requirements, maintain site and right of way tree clearing standards. In October 2010, the North American Electric Reliability Corporation issued an alert for review of field conditions of transmission lines relating to clearance issues that adversely affect transmission lines. Reliability information typically includes details on how a substation could operate in the event of a contingency such as the loss of a transmission line or a substation transformer.

Lastly, the Council has requested infrastructure impact information from the cell carriers and electric utility companies related to Hurricane Irene and Snowstorm Alfred. However, as these requests for information are not related to a formal investigation, the Council has received limited responses to date.

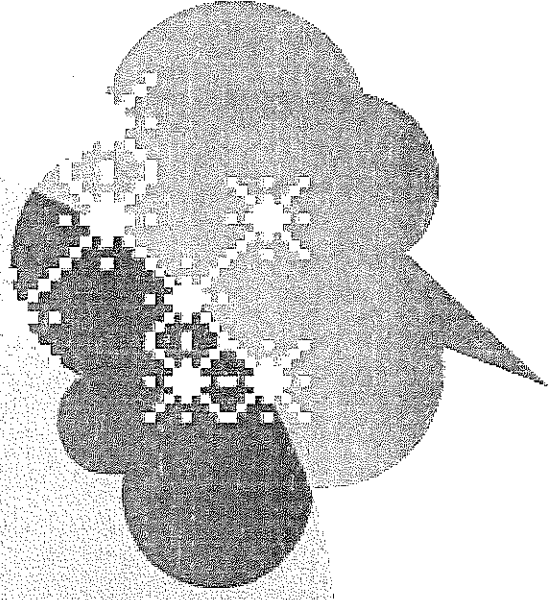
I would be pleased to take your questions.



Rethink Possible

Presentation to Two STORM Panel

John Emira
Regional Vice President
AT&T Connecticut



The Old AT&T

- **Monopoly Carrier**

- Nearly 100% market share
- Nearly no competition

- **Rate-of-Return Regulated**

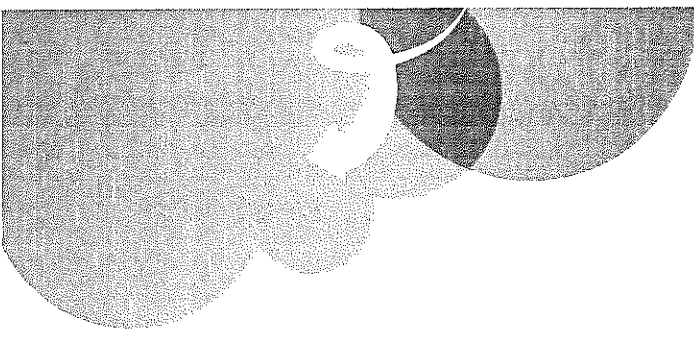
- Guaranteed earnings

- **Narrowband services**

- Plain old telephone service
- Copper network
- Few active (power-consuming) electronics field-deployed

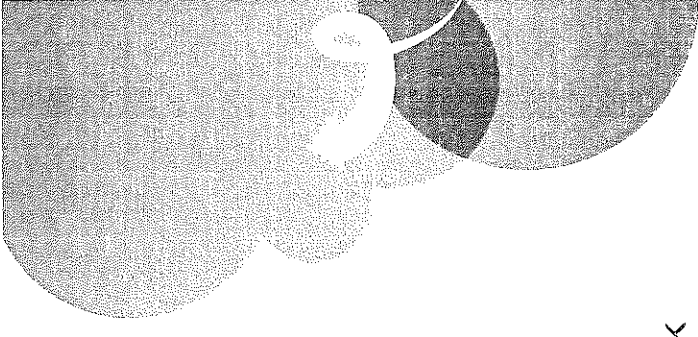
- **Slowly evolving markets and technology**

- Regulatory recovery of regulatory requirements
- Low risk of technological obsolesces and investment recovery
- Little risk of customer loss, migration, or innovation.



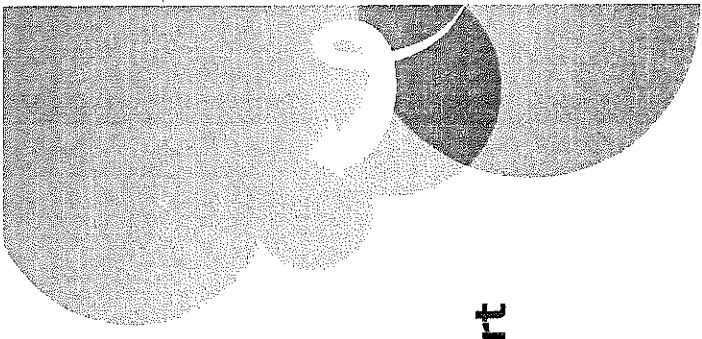
The New AT&T

- **Wireline**
 - Local phone company in parts of 22 states
 - Wired broadband provider to more than 16 million customers
 - Business services in every metropolitan area – coast to coast
- **Wireless**
 - 2nd largest wireless provider in the country with more than 100+ million subscribers
 - 3G, 4G HSPA+, 4G LTE wireless broadband, Nation's largest Wi-Fi Network
- **Video Entertainment**
 - IP-based wired video product available to almost 30 million living units nationally and more than 50% of CT homes
 - VOIP and HSIA offered with video and as stand-alone services
- **Global Enterprise & Wireless**
 - Enterprise business, international, wireless and data roaming services in over 200 countries
- **AT&T's share of the local market continues to decline**
 - 100% in 1994 to approximately 44% today



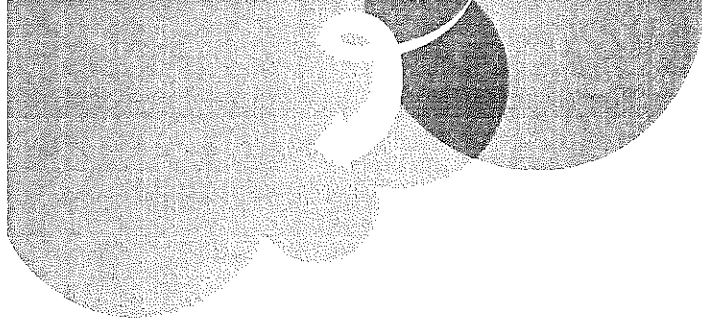
Disaster Preparedness

- **Global Company – Global Risks**
- **Preparedness is not merely a last minute endeavor; it is part of our everyday routine**
 - Designing our networks, investing, training
 - Annual preparedness meetings are conducted by each business unit
 - Periodic live drills are conducted to test emergency plans
 - AT&T participates with State and local authorities, as well as with other utilities, in emergency preparedness initiatives
- **AT&T is second to none in preparation, restoration and available human expertise and technology resources.**



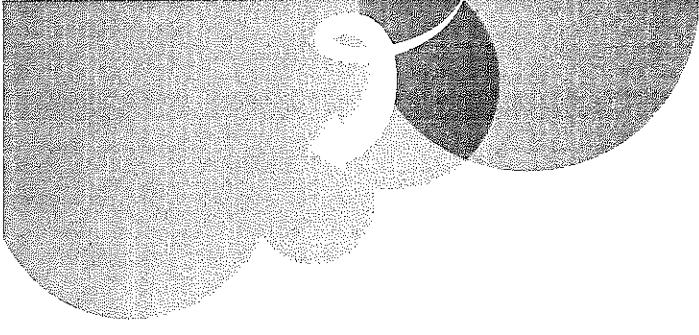
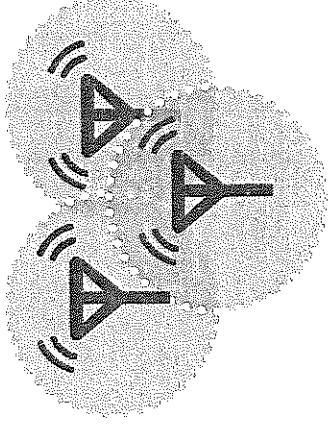
Wired Network

- **Local provider in 169 cities towns**
- **Wired network infrastructure components are located throughout the state:**
 - Poles, conduits, drops, feeder, remote terminal cabinets, central offices, video access cabinets, fiber regeneration, etc.
- **Network is a large customer of the electric companies**
 - Dependent on reliable commercial power to operate
 - Batteries support elements which need power
 - Generators support batteries in times without commercial power
- **More than 840k poles in the state**
 - AT&T jointly owns 95% of poles with the EDCs
 - AT&T is the pole custodian for roughly one-half of the 840k poles



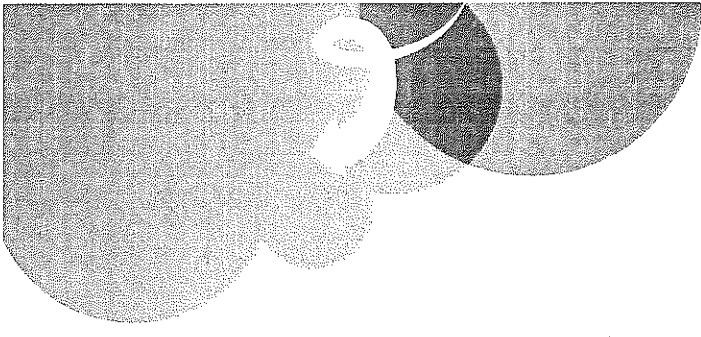
Wireless Network

- **Wireless network throughout the state**
 - Over 675 physical cell sites in the state
 - A single physical location site typically contains multiple technologies
 - Multiple competing providers
- **Wireless networks depend on reliable commercial power**
 - Batteries support elements which need power
 - Generators support batteries in times without commercial power
- **Wireless calls are “wireless” to the nearest cell site**
 - Converted at the site and backhauled to local switching stations
- **Sites designed to provide overlapping coverage**
 - Technology enhancements improving that ability

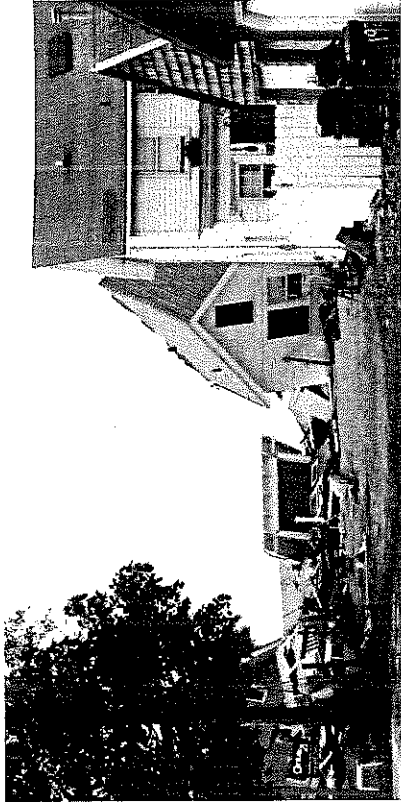


Effects of Storms

- **Wired Customers – relatively small percentage of customers lost service**
- **Sustained and widespread commercial power loss was unprecedented**
 - Led to sustained and widespread deployment of generators to our wired and wireless network elements
 - Required a labor intensive refueling of generators spread across the state
- **Replaced hundreds of poles following both storms**
- **Costs related to storm restoration are paid by AT&T shareholders, not through rate cases**



Hurricane Irene Detail



1,500+ technicians (24x7)

Dispatched over 2,000 generators (through 9/2)

115 Central Offices on generator at the peak of the response

770 cell sites on generator at the peak of the response

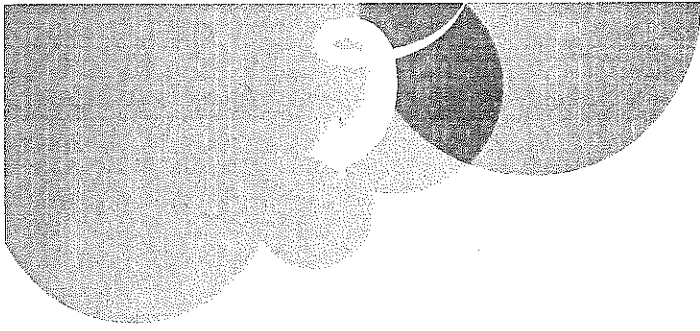
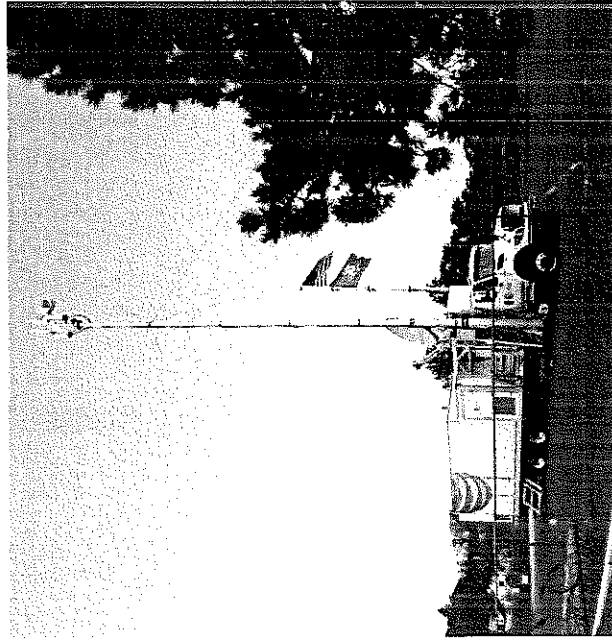
Accounted for over 25,000 employees

Activated the Global Emergency Management process; two regional Emergency Operations Centers and four Local Response Centers

COLTs deployed to Connecticut, Vermont, and New York

Provided support to FEMA in Massachusetts, Vermont, Connecticut and New York

Provided 136,000 gallons of diesel fuel and 37,000 gallons of gasoline for generators and fleet vehicles

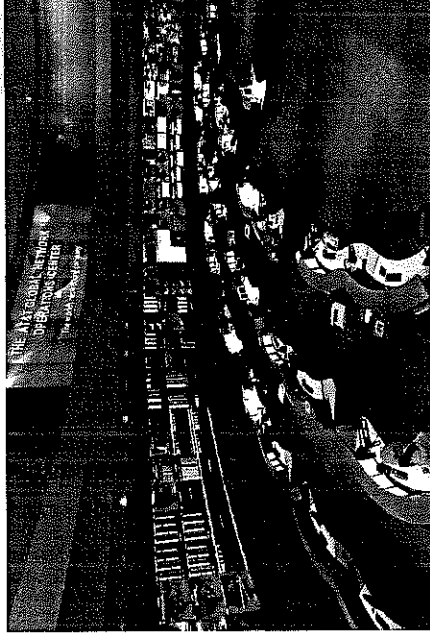


Global Network Operations Center (GNOC), Emergency Operations Center (EOC), Local Response Center (LRC)

GNOC continually monitors our global network and coordinates response across AT&T organizations, assessing the impact of the event in near-real time and prioritizing the restoration efforts.

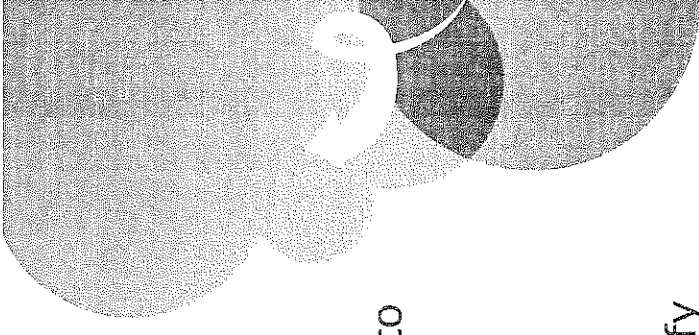
EOC provides a higher level of management to the LRC structure and is activated whenever multiple LRCs are activated.

LRCs direct local effort within a defined area and bring together key company leadership within a single command, supported and augmented by national expertise and resources. New England LRC is in Meriden.



Restoration

- AT&T prepares in advance so as to mobilize restoration teams within hours of any emergency.
- AT&T's Supply Chain Management has partnered with suppliers to ensure adequate supplies and equipment are available for restoration activities.
- Staging areas are readied with supplies and equipment as a storm's landfall is identified.
- Sweep Teams are dispatched shortly after emergencies to identify particular restoration requirements, such as poles.
- AT&T has partnered with local businesses to house and feed out-of-town restoration crews.
- Retainer contracts with suppliers are in place to provide fuel for our fleet with tanker truck deliveries directly to our field work centers, and advance bulk fuel purchases are also made.



AT&T Network Disaster Capability is Best in Class

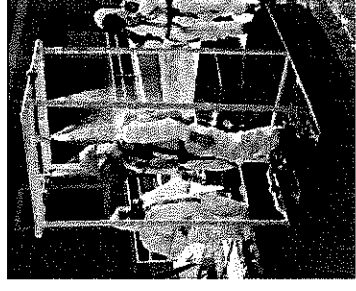
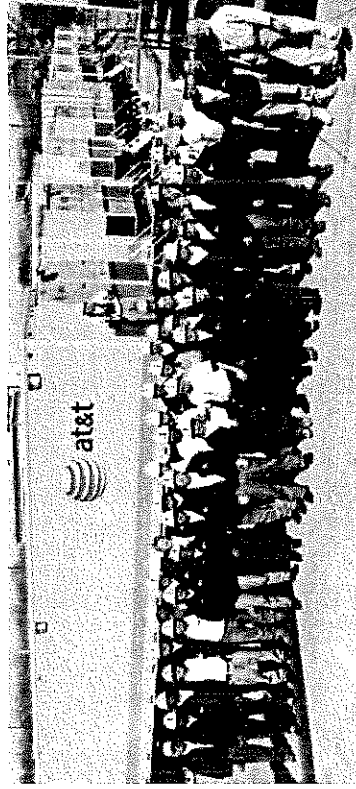
The NDR Team is composed of AT&T managers, engineers, and technicians who have received special training in the physical recovery of the AT&T Network.

Members participate in several recovery drills each year to sharpen their skills using the disaster recovery equipment and processes.

AT&T's NDR Infrastructure organization provides infrastructure support to AT&T Network offices that are at risk or that have been impacted by a disaster.

AT&T has invested over \$600 million in building a world class NDR capability.

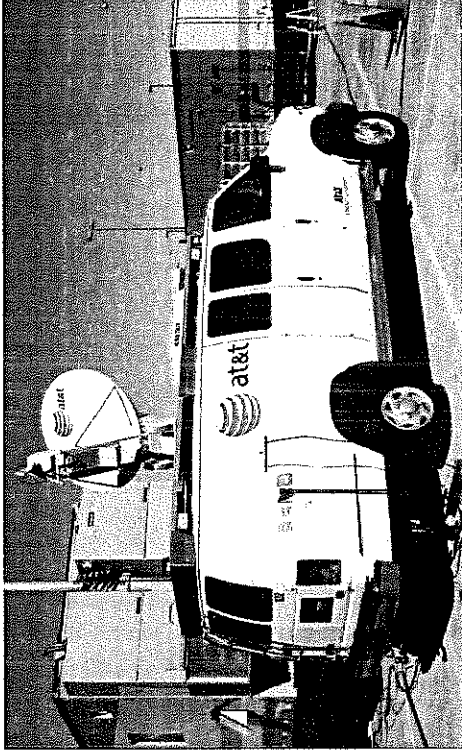
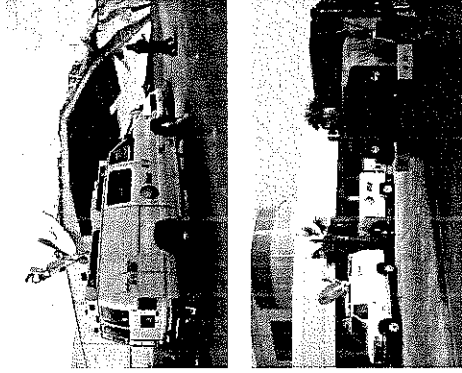
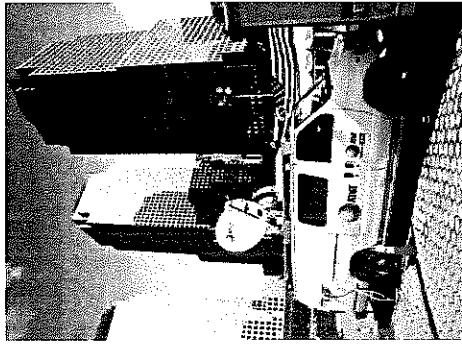
NDR web site: <http://www.corp.att.com/ndr/>



AT&T NDR – Emergency Communications

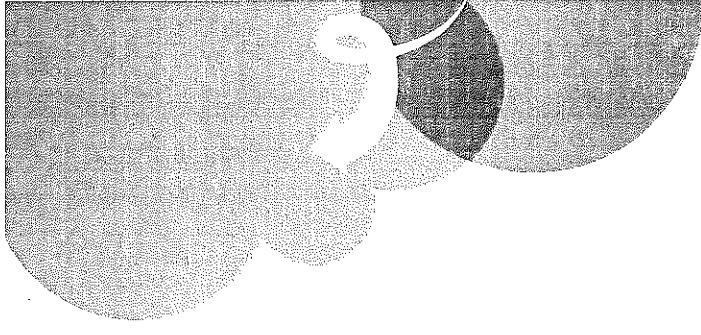
NDR establishes broadband voice and data connectivity from disaster sites using one or more Emergency Communications Vehicles (ECVs).

At state and federal request AT&T deployed ECVs to Connecticut following both storms.



Key Take-Aways from Storms

- **Communications infrastructure prioritization**
- **Telecom Task Force**
- **Wireless coverage – siting challenges must be addressed**
- **Licensing, tax treatment**
- **Communication with municipalities**



F

SEA LEVEL RISE: Planning for the Impacts of Increased Coastal Flooding under Climate Change on Connecticut's Infrastructure

Paul Kirshen, Ph.D.

Research Professor

Institute for the Study of Earth, Oceans, and Space

&

Environmental Research Group , Civil Engineering Department
University of New Hampshire

November 15, 2011

PHK Brief Bio

Civil Engineer (Brown, MIT)

25 Years Experience in Climate Change
Impacts and Adaptation

Technical Writer for 2013 NCA

Lead Author, NA Chapter, 2014 IPCC Report

Work funded by US EPA, NOAA, Corps,
Others

All research peer reviewed

Boston research cited by US Supreme Court

Topics

SLR Scenarios

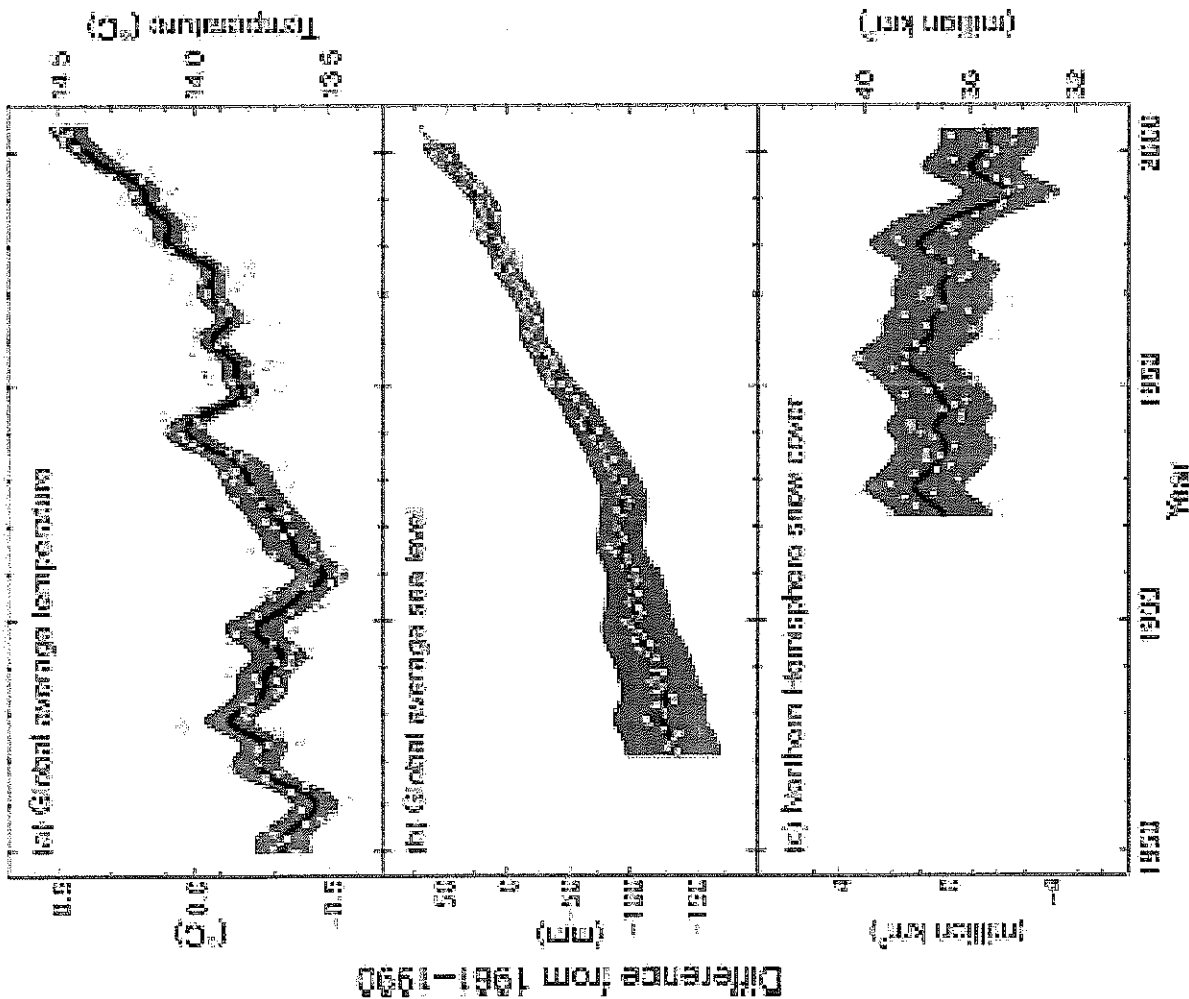
Potential Damages

Example of Planning Approach for Storm Surges with
SLR

Conclusions

Warming of the climate system is unequivocal

- Increasing global air and ocean temperatures
- Rising global average sea level
- Reductions of snow and ice



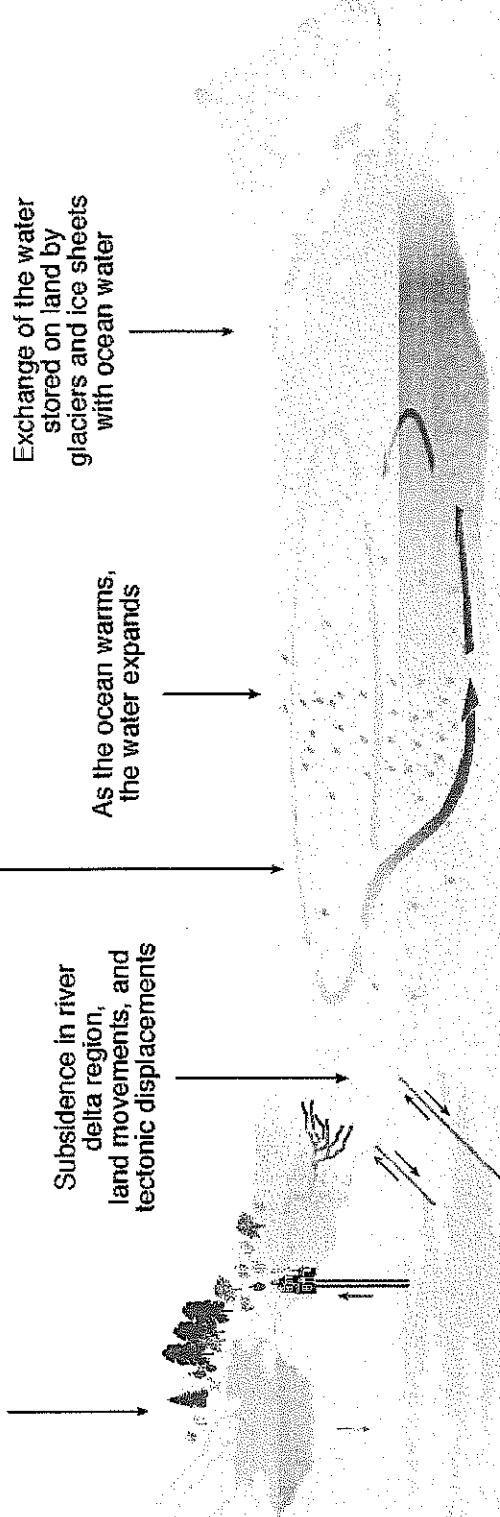
What causes the sea level to change?

Terrestrial water storage, extraction of groundwater, building of reservoirs, changes in runoff, and seepage into aquifers

Surface and deep ocean circulation changes, storm surges

Subsidence in river delta region, land movements, and tectonic displacements

Exchange of the water stored on land by glaciers and ice sheets with ocean water



Scenario Projections for Eustatic SLR

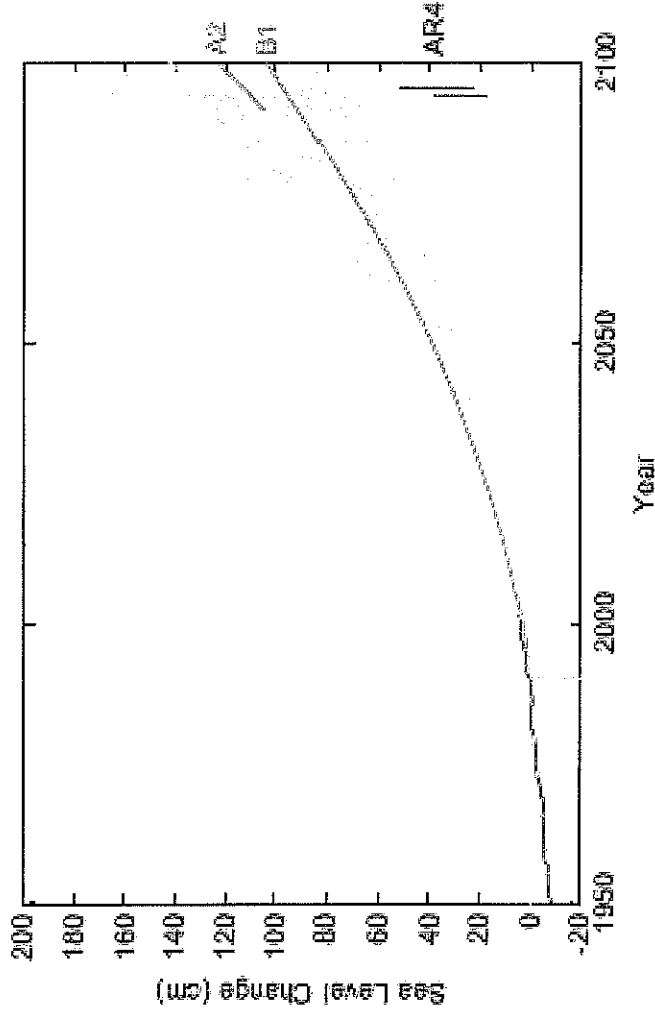
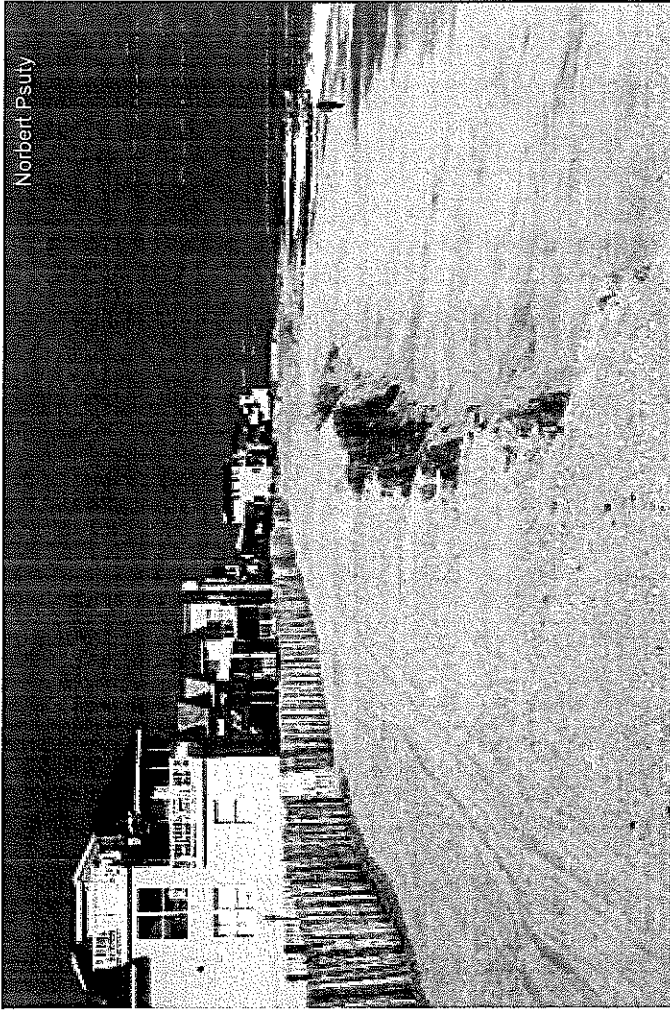
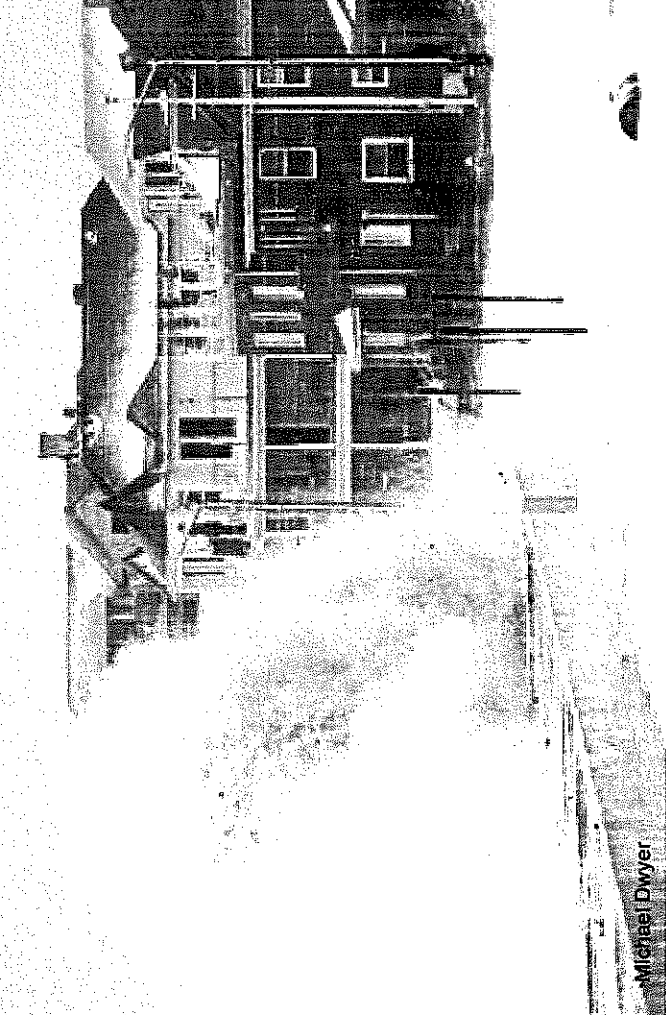


Fig. 6. Projection of sea-level rise from 1950 to 2100, based on IPCC temperature projections for three different emission scenarios (labeled on right, see Projections of Future Sea Level for explanation of uncertainty ranges). The sea-level range projected in the IPCC AR4 (2) for these scenarios is shown for comparison in the bars on the bottom right. Also shown is the observations-based annual global sea-level data (18) (rest including artificial reservoir contraction (22)).

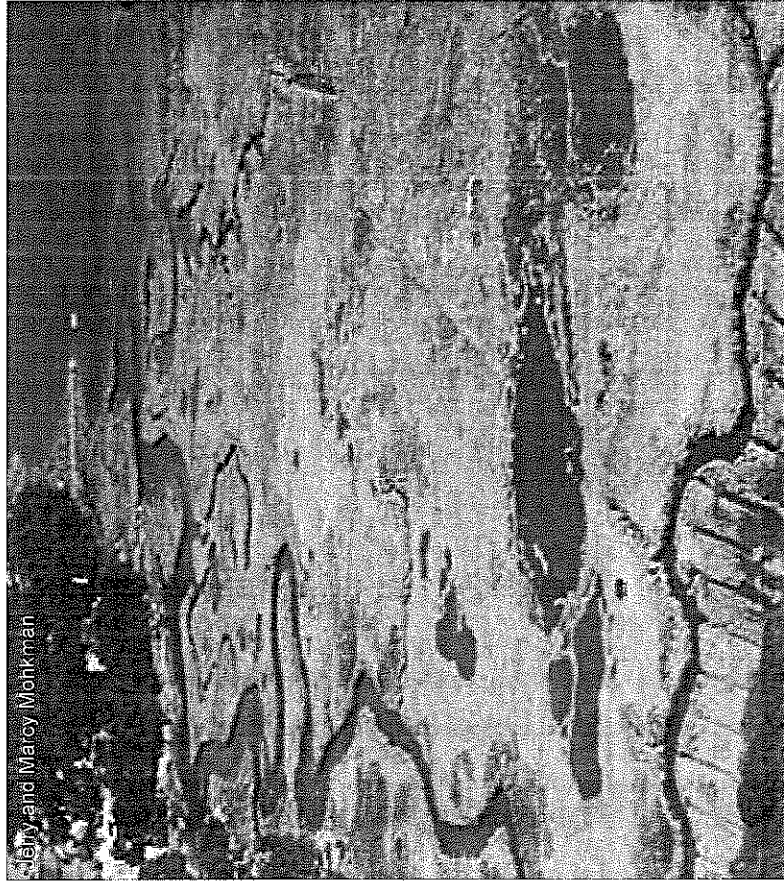
Source: Vermeer and Rahmstorf (2009)



Norbert Psuty



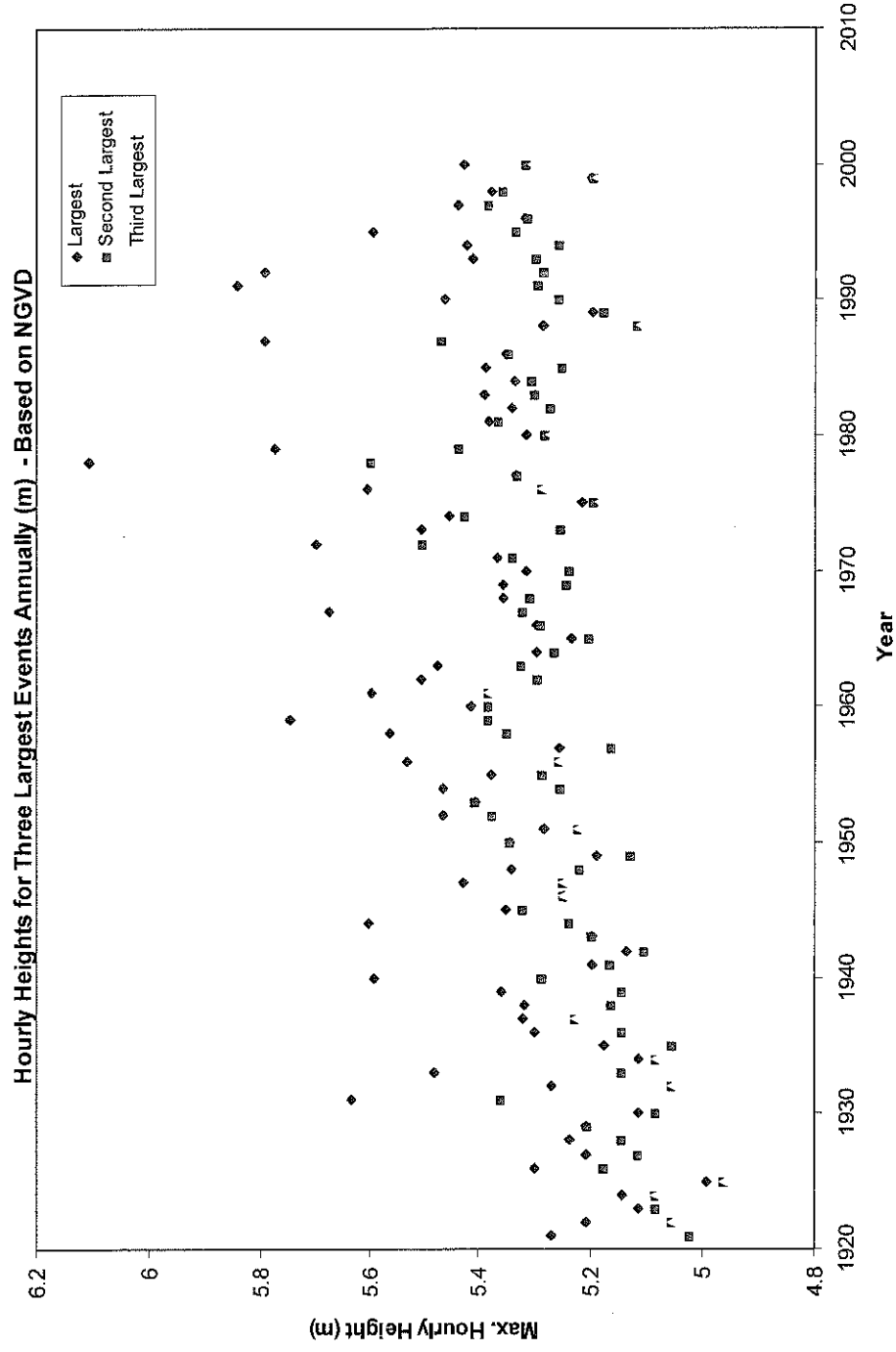
Michael Dwyer



Jerry and Marcy Monkman

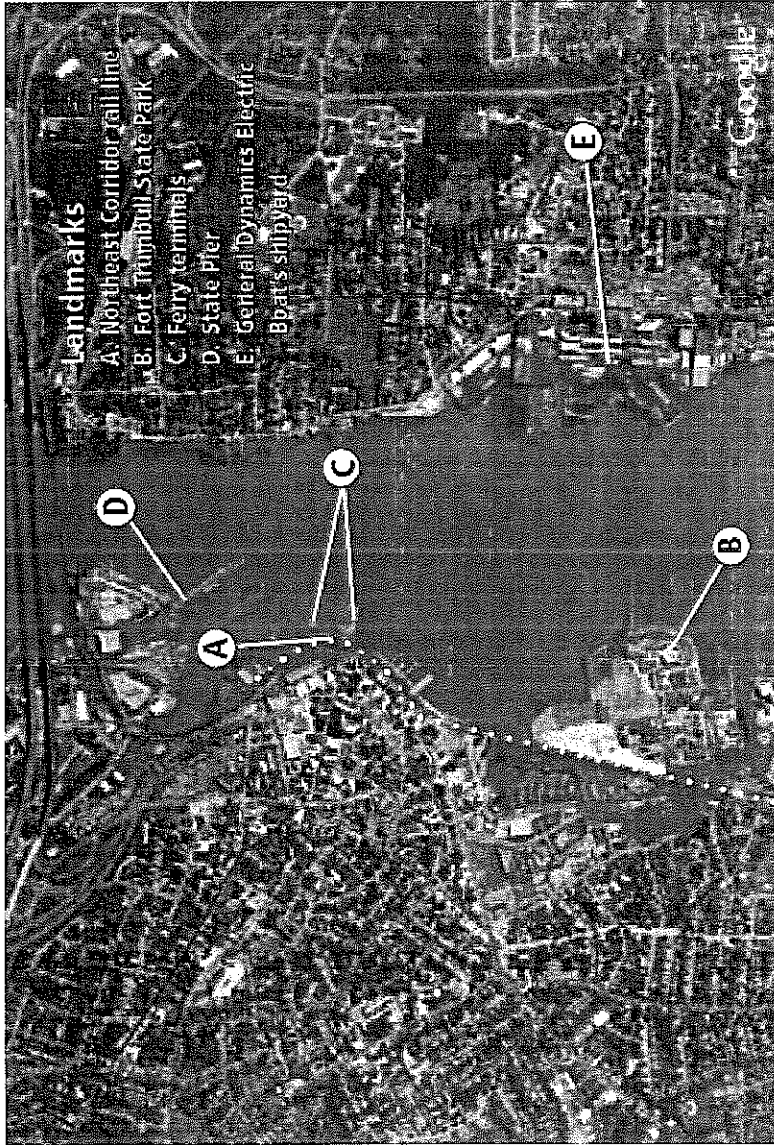
- More coastal erosion
- Wetland and other low areas inundation and loss
- More frequent flooding and drainage problems
- - increased storm intensity ?

NOS Gage Data - Boston



Source: Kirshen et al, 2004

Photo: Applied Science Associates, Inc.; Source: Google, Sanborn



New London/Groton Flooding

The light blue area in these maps depicts today's 100-year flood zone for New London and Groton (i.e., the area of these cities that is expected to be flooded once every 100 years). With additional sea-level rise by 2100 under the higher-emissions scenario, this approximate area is projected to flood once every 17 years, on average; under the lower-emissions scenario, once every 32 years. The 100-year flood at the end of the century (not mapped here) is projected to inundate a larger area of these cities, especially under the higher-emissions scenario.

Table of Future Recurrence Intervals

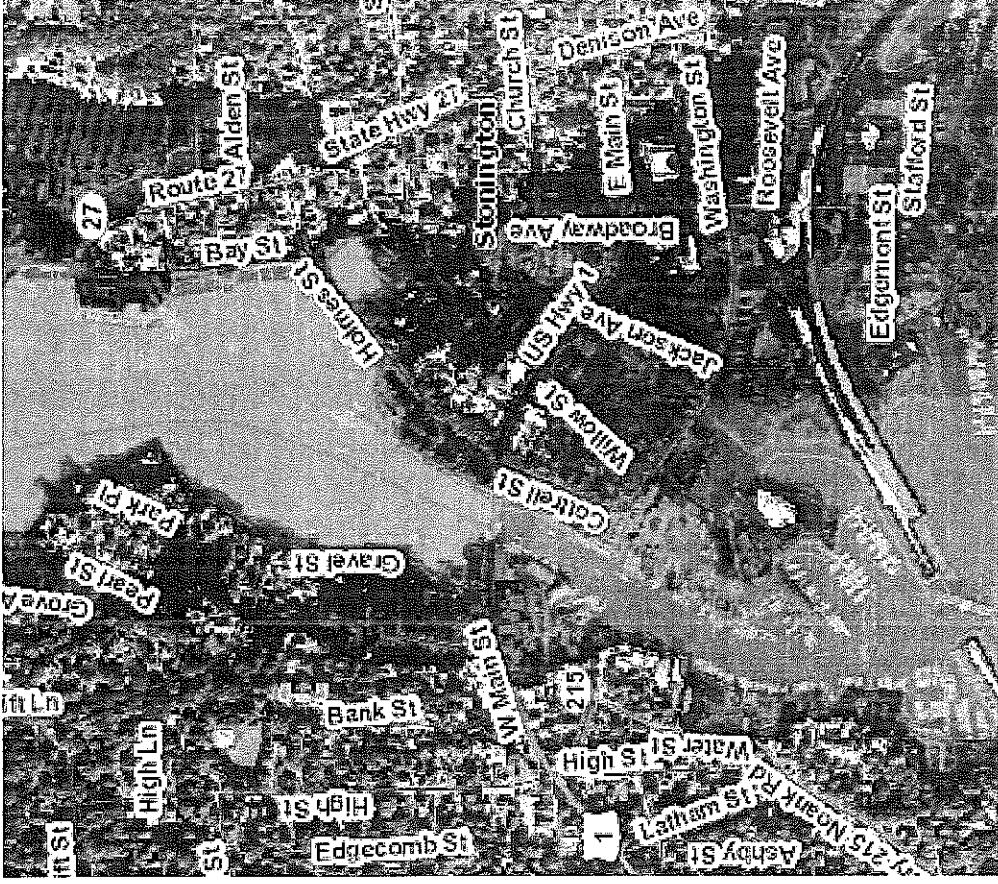
Station	Scenario	100-yr Storm Surge Elevation at MHHW (feet NAVD)					Recurrence Interval of 2005 100-yr Anomaly (years)	
		2005	2030	2050	2100	2050	2100	
Boston	B1 (mid-range)	9.7	10.2	10.7	11.8	3	<<2	
	A1FI (mid-range)	9.7	10.2	10.7	12.3	2	<<2	
	B1 (mid-range)	10.0	10.2	10.5	11.1	51	21	
Woods Hole	A1FI (mid-range)	10.0	10.2	10.5	11.6	46	9	
	B1 (mid-range)	7.4	7.6	7.8	8.3	61	32	
	A1FI (mid-range)	7.4	7.6	7.8	8.9	56	17	
New London	B1 (mid-range)	9.0	9.3	9.5	10.2	50	22	
	A1FI (mid-range)	9.0	9.3	9.6	10.7	46	11	
	Rahmstorf (mid-range)	9.0	9.5	10.1	12.5	24	<2	
Atlantic City	B1 (mid-range)	7.7	8.7	9.5	11.6	4	<<2	
	A1FI (mid-range)	7.7	8.7	9.6	12.1	4	<<2	

Estimated storm surge elevations for 2005, 2050 and 2100 for each site. Also included are the recurrence intervals in 2050 and 2100 for the 2005 100-year storm surge elevation Based on 7.06.07 table

*Note, 22 % chance of 100 year flood occurring in 25 year period

Approximate
Present 100 Year
Floodplain, Mystic
CT.

Source: CT DEP
Coastal Hazards
Mapping Tool



Cumulative Damage 2010 – 2070, SLR of 1.5 to 3 ft by 2070
Surge Flooding – Buildings and Contents
Groton Side
\$52.2 to \$56.2 million

Forms of Adaptation

- Reactive
- Proactive

Research shows that 'proactive' is generally most effective

Built Environment Adaptation

- No action
- Accommodate
- Protect
- Retreat

A mix of actions may be taken over space and time

Approach to Adaptation Planning Overcoming the Challenges of Uncertainty

- **Robust Strategies** that function reasonably well no matter what climate change occurs
- Be stakeholder driven
- Includes **no-regrets** and **co-benefits** actions
- Integrated with GHG mitigation
- Portfolio approach
- Integrated part of sustainability planning
- Flexible, employs Adaptive Management as needed
- Responsive to Climate Surprises (eg abrupt climate change)
- Recognizes Adaptive Capacity (economic, social, and natural resources, institutions, technology)
- Develop two basic types of actions
 - “**Here and Now**” for new projects and presently threatened areas
 - “**Prepare and Monitor**” actions implemented in the future

Example of “Here and Now”

• Key floors above
2085 High Estimate
100 Year Flood

• Mechanical, electrical
and emergency
services on roof out of
harm’s way

• Operable windows
keyed open in event of
systems failure

• Critical patient
programs above ground
floor



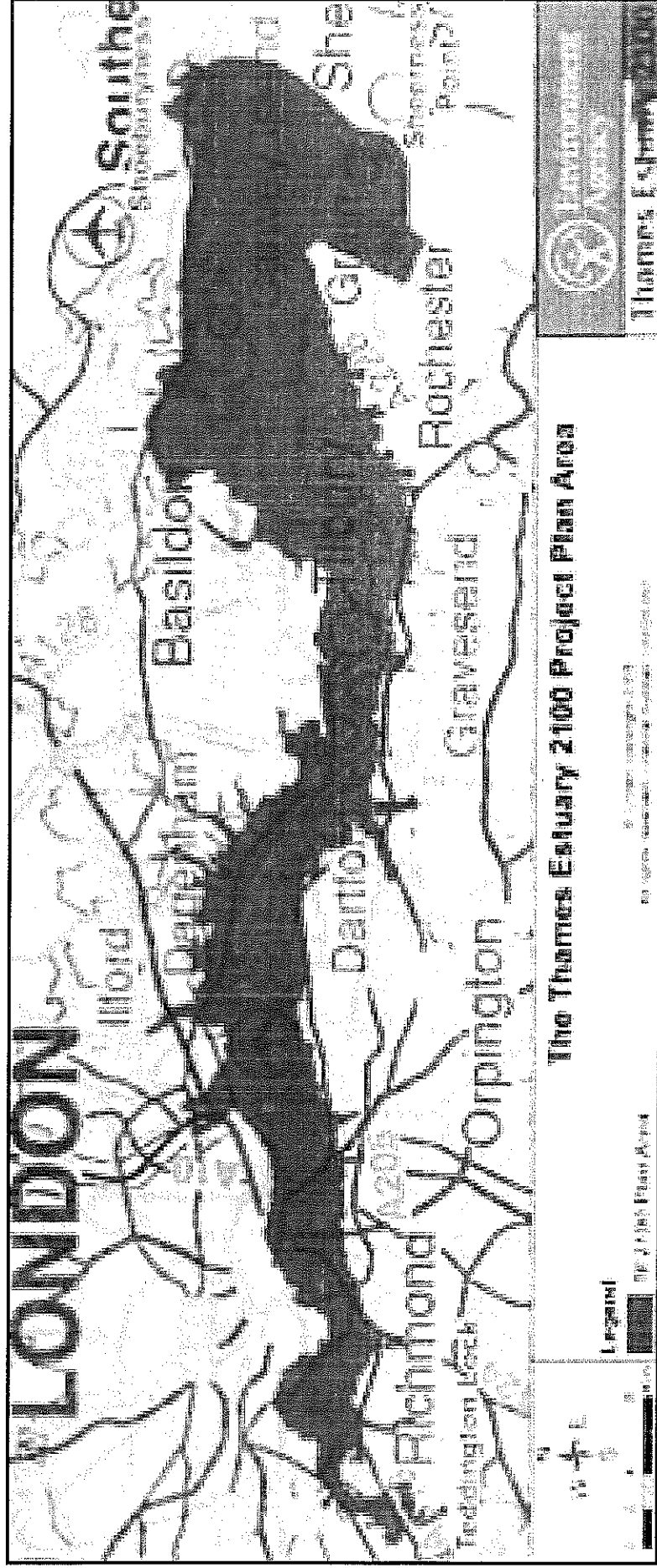
• Spaulding Rehabilitation Hospital, Charlestown Navy Yard,
Boston

• Architect: Perkins + Will

Analytical diagrams P+W / Partners HealthCare




Example of “Prepare and Monitor” Thames Estuary, United Kingdom

Source: Thames Estuary 2100



The Plan

Content of the Thames Estuary Flood Plan

Three time horizons – three themes for flood risk management	
	<p>The first 25 years from 2010 to 2034</p> <p>“Maintaining confidence and planning together”</p>
	<p>The middle 35 years from 2035 to 2069</p> <p>“Renewal and reshaping the riverside”</p>
	<p>To the end of the century from 2070</p> <p>“Preparing for, and moving into the 22nd century”</p>

- Continuing maintenance, operation and essential improvements.
- Safeguarding the spaces for future flood management.
- TE2100 will have a real influence in the preparation of, and updating of regional and local strategic and spatial plans.

- Many of the existing walls, embankments and smaller barriers will need raising and major refurbishment or replacement in this period.
- These major projects provide an opportunity to reshape our riverside environment through working with spatial planners, designers, environmental groups and those who live and work in the Estuary area.

- Towards the end of this period, a decision will be made on the century option to be adopted.
- From 2070 (based on government's current climate change guidance) a major change will be needed and one of our “end of the century” options will be implemented.
- This is a long time in the future but your views are important as they will set the basis from which future changes in attitudes are measured.

Features

- Actual Strategy by and for the stakeholders !
- Staged in Time
- Mix of Strategies (hard and soft)
- Includes monitoring
- Flexible

New Kinds of Infrastructure Planning and Engineering ?

Designed to meet range

Adjustable

Combinations over time and space
(for example, mix gray and green)

More frequent replacement ?

Decentralized ?

Green ?

More integration with Ecosystems

Safe to fail

Development of “Standards”

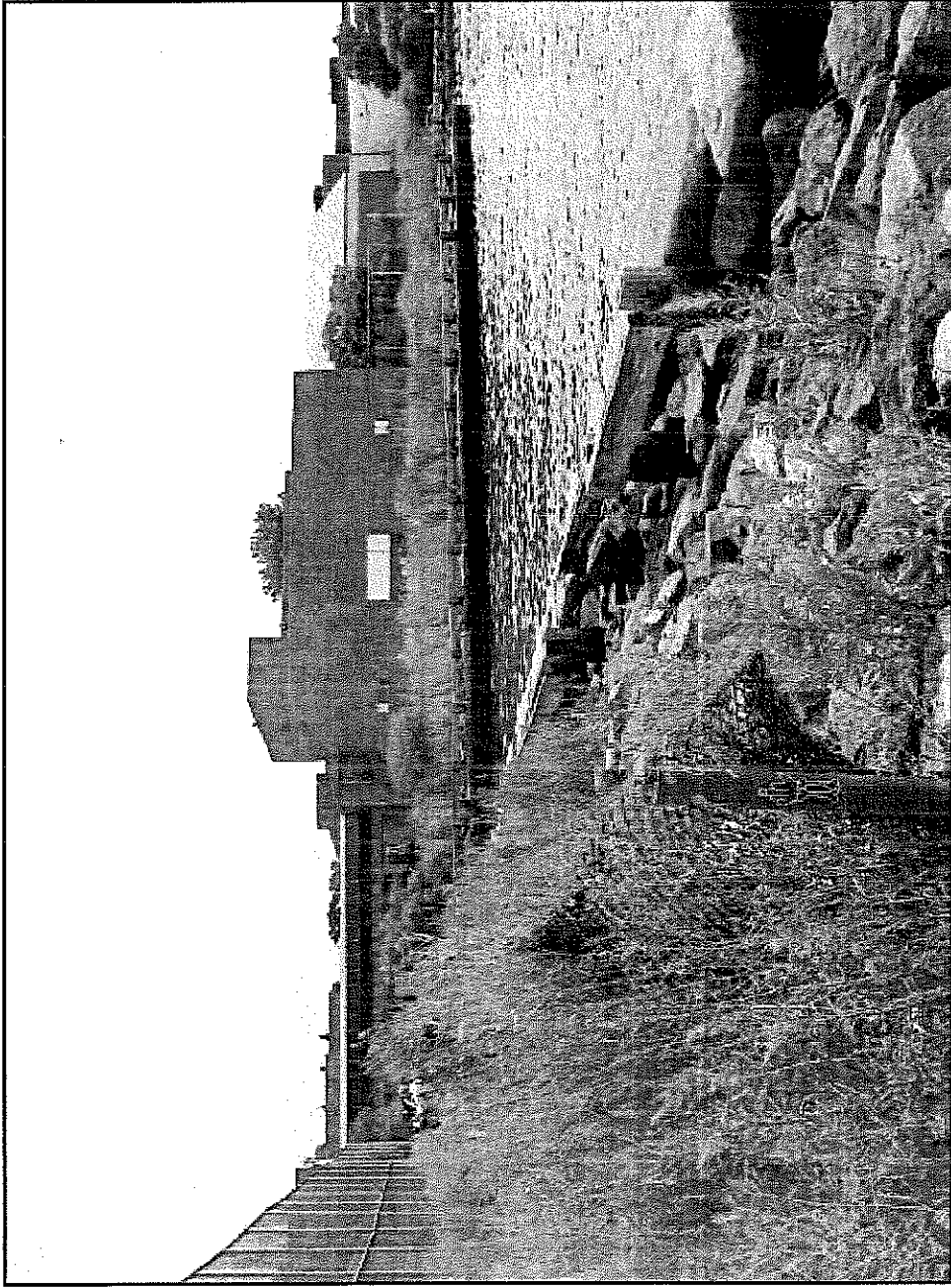


Figure 2. Umama School/Harborside Community Center as it exists today.

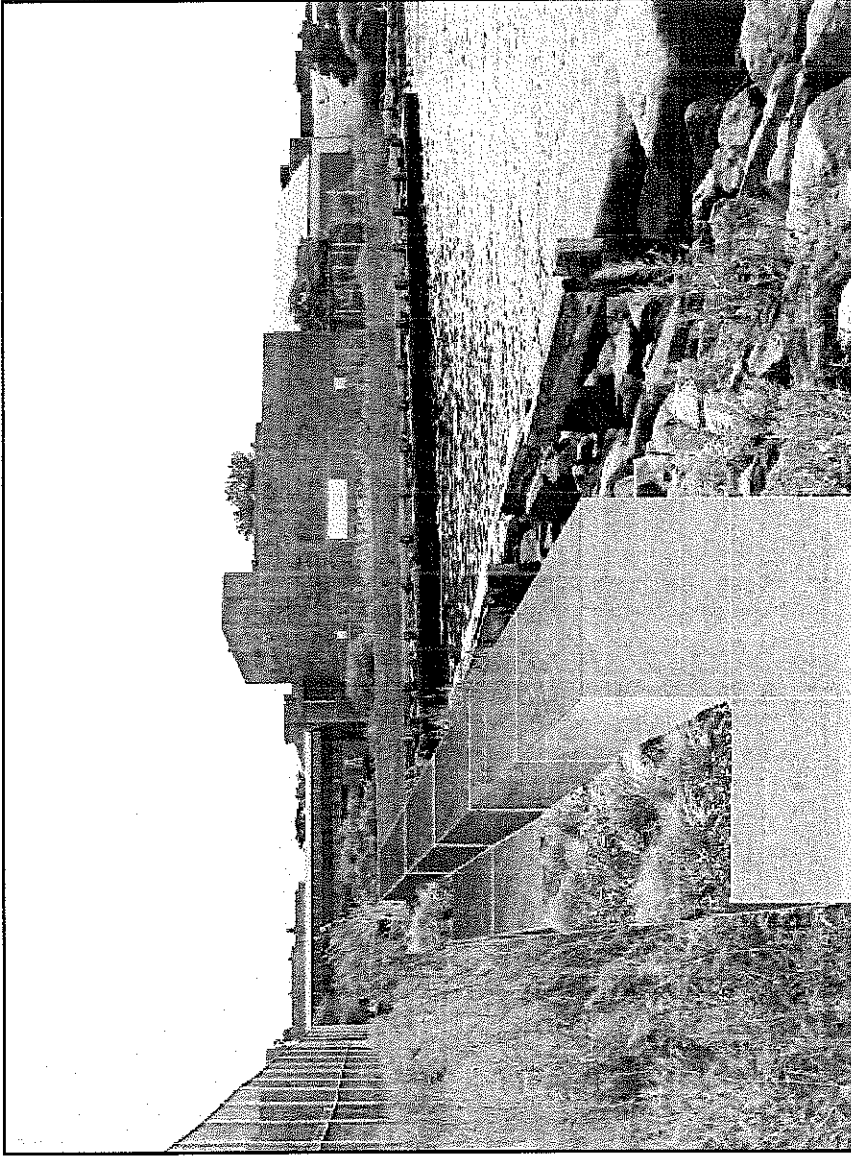
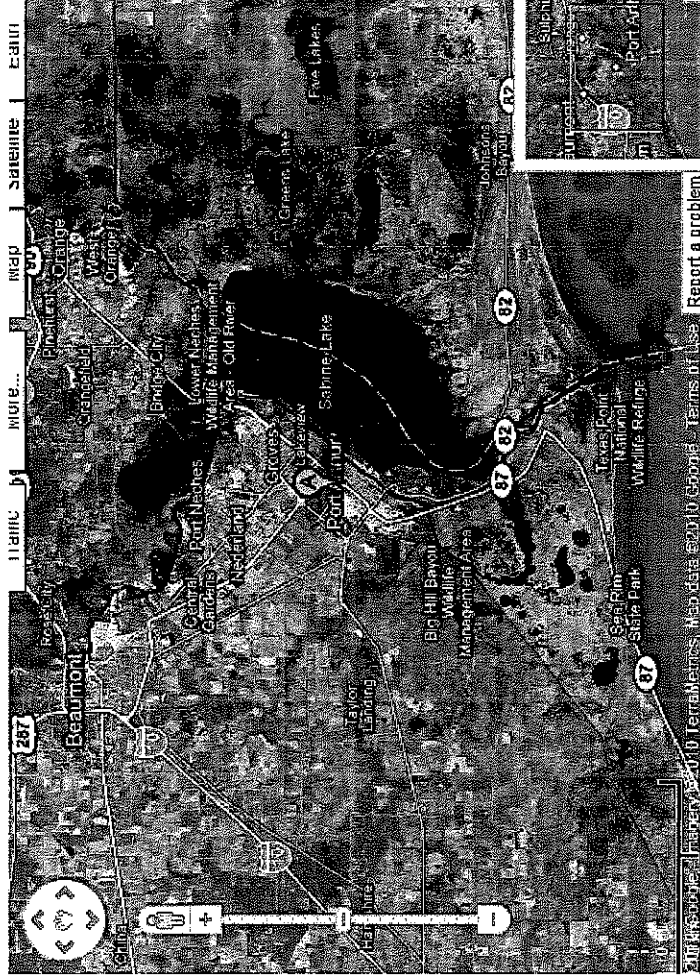


Figure 3. Conceptual modular concrete seawall at Umama School/Harborside Community Center.

Joint Adaptation Planning of Built and Natural Environments (role of ecosystem services)



•Wamsley et al (2010) show in LA that 1 meter attenuation for 6 – 50 km of wetlands

Overall Conclusions

- Connecticut coast is vulnerable
- Best to have planning now for managing future impacts
- Adaptation planning requires new planning approaches based upon uncertainty
- Flexible infrastructure is needed in some cases

Thank you

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Mary Glassman Testimony – Tuesday, November 15, 2011

I would like to thank members of the Storm Panel for your service – and Governor Malloy for providing municipal officials a chance to share our experiences from recent Storm Alfred. As hearty New Englanders, we know that severe weather events are part of the New England experience. However, it is absolutely essential that we learn immediately from this past storm event – so together, we are better prepared for the next emergency.

We know that the goal of protecting the public safety and health of the people of Connecticut is shared by our state and local officials, emergency responders and utility officials. That is the spirit in which we testify today.

There is no question that Simsbury and our neighboring Farmington Valley towns were among the hardest hit in Connecticut. From the moment the storm hit on Saturday, October 29th until power was finally restored to the last Farmington Valley customers on Thursday, November 10th – nearly 13 days later – thousands of customers were left in the dark, in many cases stranded in their homes for days by down trees and wires without any accurate information as to when power restoration would occur.

As difficult as it was for customers to be without power, the Town's top priority from Day 1 was public safety. We had hundreds of residents who were completely inaccessible by emergency personnel for days. We communicated that dire situation to CL&P immediately and evacuated by foot residents whose homes were damaged. When utility crews were not dispatched to address our safety concerns, the Town – two days after the storm – called upon the National Guard. It was only when the National Guard arrived on Thursday that progress was made and more than 100 closed streets were made accessible.

I cannot emphasize how frustrating it was for 100 percent of our town to be completely in the dark for four straight days – Simsbury has 10,107 CL&P customers, including nursing homes, businesses and homes. For the first two days of the disaster, Simsbury and the Farmington Valley towns reported only one crew assigned to each town. It was not until Thursday, November 3rd – Day 6 of the disaster – that the towns could confirm that crews were working in our communities. By Thursday, Farmington, Avon and Simsbury still had between 97 percent and 85 percent of CL&P customers without power. Meaningful increases in crews took place on Day 7 of the Disaster when upper-level CL&P officials began meeting regularly with the Farmington Valley towns collectively. On Saturday – Day 8 of the storm – CL&P admitted the damage was much greater than they were aware and called the damage “cataclysmic.”

We would like to share 10 lessons learned from the Simsbury experience:

1. Local Emergency Operations Plans Work

Simsbury is fortunate to have local Fire Marshall Kevin Kowalski as our Emergency Management Director. Mr. Kowalski is to be commended for overseeing the town's detailed emergency disaster plan, for conducting regular emergency drills and for encouraging the emergency response team – including myself – to receive emergency preparedness training. The Town's Public Safety committee also meets monthly with local emergency responders including a CL&P liaison. Our local plan worked. Within six hours of the storm, the Town opened its Emergency Shelter. Within 24 hours, the town activated its Emergency Operations Center and declared a state of emergency. The town was in disaster mode with more than 100 roads inaccessible by fire, police and ambulance and that information was quickly communicated to CL&P.

2. Rely on Local Volunteers

During the 13 day event, Simsbury provided shelter to 7,423 people and provided 5,960 meals. The Town called on upon everyone to help during the disaster. Local police, fire and ambulance worked around the clock. The Ladies Auxiliary, Chamber of Commerce, and Rotary served meals and provided comfort. Town staff became a huge asset to our community – with library and parks and recreation personnel running programs as a way to encourage families to feel comfortable coming to the shelter.

3. Accurate Information is Essential to Make Decisions and to Inform Our Residents

During the 13 day storm event, Simsbury and the Farmington Valley received little accurate information as to the number of crews working and the timeframe for restoration. While CL&P did have a liaison who regularly worked with our Public Safety Committee and Emergency Operations Team, this liaison was reassigned and replaced with a new liaison. We would suggest the municipal liaison system works better with continuity during an emergency.

4. Give Us the Bad News First

The Towns communicated the severe nature of the situation immediately to CL&P liaisons and the town's priorities. Despite our concerns, CL&P communicated their plan for 99 percent restoration by Sunday, November 6th even though Simsbury outages remained at 55 percent. By early Sunday, it was clear the goal was not attainable. Yet that was the information communicated to our residents. It is absolutely essential that towns receive accurate information upon which to make decisions such as shelter operations, school delays. We need honest assessments of restoration timeframes.

5. Don't Leave Other Utility Companies Out of the Loop

While CL&P is the focus of the storm review, other utility companies including AT&T as well as cable companies need to be part of the emergency operations plan. It was not until Day 8 of the storm event that the Farmington Valley towns finally heard from communications company representatives about restoration plans.

6. Prioritize Making Streets Safe

In the past, CL&P crews were dispatched to work with town public works crews. During this storm, CL&P crews worked independently. Town crews ready to remove debris were paralyzed by the lack of qualified line crews needed to make roads safe. We don't understand why the utility company moved away from past practices which always worked well.

7. Regional Collaboration is Critical to Success

Working collaboratively with the other Farmington Valley towns proved to be a highly successful way of engaging CL&P and identifying regional priorities.

8. Address Medical Needs

During the nine days that Simsbury operated its Emergency Shelter, the town was overwhelmed with frail and medically compromised residents. Some residents were released from local hospitals directly to the town shelter. Others – including those with Alzheimer's and incontinence – required medical attention not available from volunteers. It is important to look at the best facility to handle the medically needy during an emergency.

9. Clarify the Role of the American Red Cross

Given the overwhelming numbers of families needing shelter and the extended period of time, the Town contacted the Red Cross on Monday, Day 3. The Red Cross took over shelter operations during the last two days. We would suggest that discussion is needed over regional shelters.

10. Use Town Resources Better

The tragedy in all of this is that Simsbury and other towns had resources available to help from the very beginning – if we had been provided with the right information, we could have helped to make our streets safe, to clear our roads and to shorten the timeline for restoration of power. In spite of these challenges, I am proud of the way our Town and the other Towns in the Farmington Valley responded in the face of a crisis. Because we were prepared, we were able to take the steps necessary to secure the safety of our residents. We look forward to working with all of you and to being part of the solution.



To: Two Storm Panel Members
From: Barbara Henry
COST President
Date: November 15, 2011
Re: **Storm Response Efforts – Municipal Recommendations**

Thank you for the opportunity to comment on behalf of the Connecticut Council of Small Towns (COST) relative to storm response efforts.

Following Storm Irene, many of our member towns expressed frustration relative to the response efforts of the major electric utilities, identifying difficulties in 1) obtaining accurate information about restoration efforts, 2) coordinating tree and branch removal with local public works crews to clear major roads and intersections; 3) prioritizing power restoration in areas that serve vulnerable populations, such as nursing homes and hospitals; 4) prioritizing power restoration to business centers and 5) managing and dispatching utility crews in a timely manner. Based on recent input from member towns, these issues continue to be a problem for many towns hard hit by Storm Alfred. At the same time, some towns gave the electric utility's positive marks for their response efforts following Storm Alfred.

Clearly, towns that had timely information about power restoration efforts, including when and where crews would be assigned to their area had a much more favorable opinion about the utility's response efforts. Unfortunately, many towns felt "abandoned" by their electric utilities because they did not receive accurate, timely information, leaving them literally and figuratively in the dark.

COST recognizes that state agencies, municipalities and electric and other utilities were faced with the enormous challenge of responding to an unprecedented number of power outages and fallen trees following Storm Irene and Storm Alfred. To assist the panel in developing a framework for improving future response efforts, COST developed the following recommendations based on input from member towns following Storm Alfred.

PRELIMINARY RECOMMENDATIONS

COST and its member towns stand ready to work with lawmakers and public officials to develop a plan that will ensure that town leaders are able to coordinate restoration efforts more effectively to ensure that service is restored and critical roads and intersections are cleared more quickly. Based on the preliminary input of our small towns, COST submits the following recommendations for your consideration:

■ Electric Utility Communication

- Develop a comprehensive communications outreach plan to improve coordination of restoration efforts with town officials, including the dispatching of crews to ground downed wires;
- Provide towns with emergency contact information to ensure that town officials can get in contact with utilities to ensure that crews are dispatched immediately to respond to dangerous or life threatening situations;
- Establish a centralized contact point for town officials to communicate with utility officials to better coordinate efforts between utility work crews and public works departments;

- Continue to utilize municipal liaisons to improve communication between town officials and electric utilities;
- Ensure that municipal liaisons have accurate and timely information on power restoration efforts to relay to towns;
- Provide accurate timeline for restoration efforts.

■ Utility Response Efforts

- Work with town officials to identify critical public safety service areas, such as fire or police stations as priority areas for restoration efforts, even if they are not in densely populated areas;
- Work with town officials to identify areas that serve vulnerable populations, such as elderly housing, as priority areas in restoration efforts, even if they are not in densely populated areas;
- Work with town officials to identify key access roads in small towns that are vital to obtain food, water and health care services or to evacuate residents;
- Improve coordination between assessing storm damage and beginning restoration efforts to that restoration efforts are not delayed;
- Maintain a data base of municipal priorities for power restoration rather than compile such data during each power outage.

■ Utilization and Management of Crews

- Following a storm event with significant power outages, immediately assign one line crew to each town to work with town officials to identify what needs to be done to render areas safe and to restore or repair power;
- Dispatch more "make safe" crews assigned immediately;
- Communicate directly with town officials regarding the number and location of crews assigned to a town;
- Maintain a visible presence in towns experiencing widespread power outages – many towns and residents were understandably frustrated when they did not see any crews or 1 crews were redirected after a short time in town;
- Better manage crews once they arrive on site, particularly out of state crews that must wait for direction;
- Enable liaisons to keep track of field crews directly through the use of GPS;
- Incorporate into any response plan procedures for employing sufficient staffing levels in the event of widespread outages, including customer service representatives and work crews.

■ State Agency Response Efforts

- Ensure that the state Department of Transportation (DOT) clears state roads in a timely manner, which many small towns depend on as major access roads;
- Redeploy DOT crews and resources from other towns less impacted by storms to harder hit towns;
- Pre-stage the distribution of commodities prior to the storm to ensure timely distribution;
- Develop best practices from regions that were successful in communicating with town officials and other emergency personnel and share with other regions.

COST is an advocacy organization committed to giving small towns a strong voice in the legislative process. Its members are Connecticut towns with populations of less than 30,000. COST champions the major policy needs and concerns of Connecticut's suburban and rural towns. More information is available at www.ctcost.org