

# RECORD OUTAGE RECORD RECOVERY



**Public Service  
of New Hampshire**

The Northeast Utilities System



No other storm in New Hampshire's history has come close to inflicting the sheer enormity of damage caused by the ice storm of 2008.

Before this unprecedented event, the most devastating storm PSNH had faced in 82 years of service had left about 93,000 customers without power. The ice storm of 2008 dwarfed that storm in every way, causing three times as much damage in less than 24 hours. At peak, more than 400,000 homes and businesses had lost power statewide, hundreds of roads were impassable, and entire sections of the state's electric system had crashed to the ground, tangled in fallen trees and branches.

Thousands of utility and emergency personnel were mobilized to respond to this disaster, including hundreds of PSNH employees, utility crews from as far away as Canada and the Midwest, National Guard troops, firefighters, police, municipal and state officials, and many other volunteers and professionals.

The people of New Hampshire also stepped up admirably, putting their own problems aside to take care of neighbors, volunteer at emergency shelters, and offer support and encouragement to utility crews and other emergency responders working in their communities.

PSNH is proud of the selflessness, agility, and collaboration that defined New Hampshire's response to this unprecedented natural disaster. This report presents a broad overview of those response efforts, particularly as they relate to the restoration of power to more than 322,000 PSNH customers statewide.

Our deepest respect and gratitude go out to all of the people who pulled together to help our state recover from this disaster as quickly and safely as possible.

**PSNH Employees**

FEBRUARY 2009

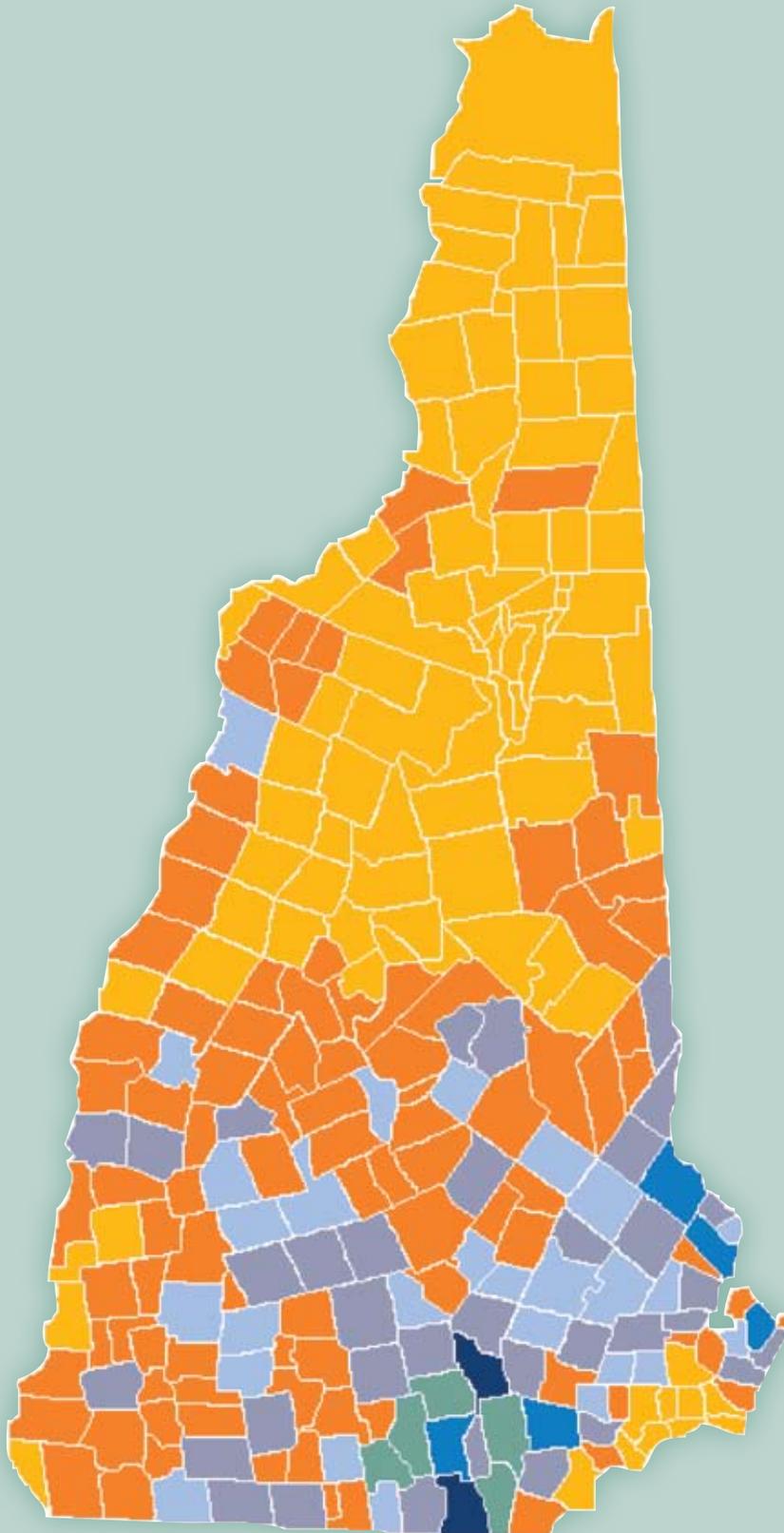
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### Date of Storm: DECEMBER 11-12, 2008

Amount of freezing rain	<b>More than 2 inches across southern NH</b>
Percent of state without power at peak	<b>About 55%</b>
Outages statewide	<b>400,000+</b>
PSNH peak customer outages	<b>322,000</b>
Number of PSNH circuits out at peak	<b>342 (53% of the system)</b>
Major snowstorms during restoration effort	<b>2</b>
Total number of crews involved in restoring power to PSNH customers	<b>1,205</b>
PSNH/NU employees and retirees assigned to storm duty	<b>About 1,700</b>
Customer calls	<b>More than 408,000 in 13 days</b>
Miles of power cable restrung	<b>105 (the distance between Manchester and Littleton on I-93)</b>
Damaged utility poles replaced	<b>780+</b>
Fuses installed	<b>13,600+</b>
Transformers replaced	<b>1,300+</b>
Duration of restoration effort	<b>99.9% of customers restored in 13 days</b>
Cost of restoration effort	<b>Estimated at \$75 million</b>

# PEAK OUTAGES BY TOWN



- 1 - 1,000 outages
- 1,001 - 2,000 outages
- 2,001 - 5,000 outages
- 5,001 - 10,000 outages
- 10,001 - 15,000 outages
- 15,001+ outages
- Communities outside PSNH's service territory, or unaffected by the storm at peak

## NORTHERN

The northern part of New Hampshire received mostly sleet and snow, which helped to lessen storm damage in this area. Service was restored to 100 percent of the customers served by PSNH's Chocorua, Berlin, Lancaster, and Tilton area work centers by Day 7 of the restoration effort (Dec. 18). Crews normally assigned to the northern region were then redeployed to the hardest-hit areas in the southern and western parts of the state.



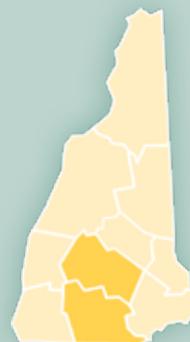
## SEACOAST

Although the Seacoast area was hit very hard, it sustained less severe damage than the southern and western parts of the state. PSNH crews completed the last portion of restoration work in the Seacoast region on Day 10 of the restoration effort (Dec. 21). Crews normally assigned to the Seacoast area were then redeployed to reinforce personnel in the southern and greater Monadnock regions.



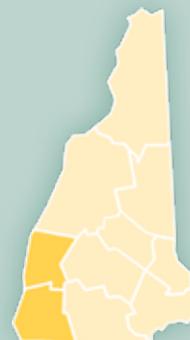
## SOUTHERN

The heavily populated southern region of the state received more than two inches of sustained freezing rain precipitation, resulting in severe and widespread damage to trees and electrical equipment. In addition to reconstructing several major circuits from the ground up, crews had to repair thousands of smaller power lines that connected individual residences and smaller pockets of homes to the electric grid. Crews restored service to 99.9 percent of PSNH customers in the southern region by Day 13 of the restoration effort (Christmas Eve).



## WESTERN

Rural conditions and extreme damage to the electric system presented tremendous challenges in the greater Monadnock region. Crews were redeployed to the western part of the state as soon as they were freed up from other commitments, and three additional emergency operation centers were established in New Ipswich, Peterborough, and Fitzwilliam to reinforce local operations. With more than 450 line crews, 140 tree-trimming crews, and 55 service crews flooding the area in the final days of the restoration effort, PSNH was able to restore service to 99.9 percent of its customers in the western region by 6:00 p.m. on Christmas Eve.



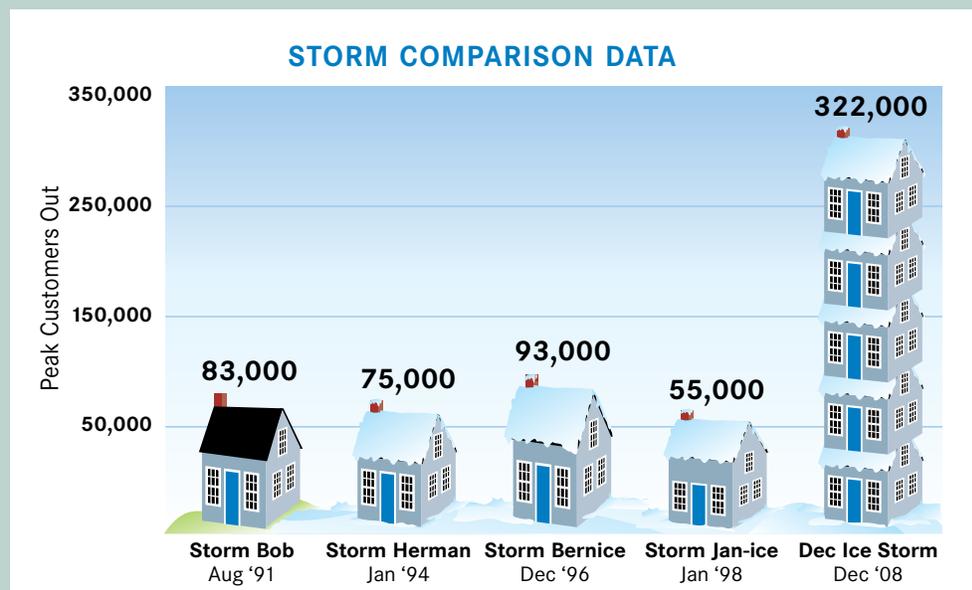
The December 2008 ice storm caused more damage than any other weather event to hit New Hampshire in recorded history. In response to the storm, President Bush issued an emergency declaration for the entire state of New Hampshire on December 13, 2008, and a major disaster declaration on January 2, 2009. No other natural disaster in New Hampshire has prompted the President to issue a statewide emergency declaration since the blizzard of March 1993 (the so-called “Storm of the Century”).

In terms of power outages, the damage from the December 2008 ice storm was more significant than PSNH’s top four prior storms, combined. More than 322,000 PSNH customers were without power when outages peaked on December 12, 2008. By way of comparison, the January 1998 ice storm left 55,000 PSNH customers without power at its peak, and the worst storm in PSNH history prior to the December 2008 ice storm—Snowstorm Bernice in 1996—left a total of 93,000 PSNH customers without power at its peak.



“If you remember the tornados from July, and the amount of damage that that did in a real narrow swath...you take that and multiply that 100-fold, and that’s what you got out here with this ice storm. Unless you go and look at the damage, I don’t think anybody can visualize the amount of damage that the utilities across this state have suffered, and the amount of work that goes in it.”

**Greg Crotto, State Command Sgt. Major, NH Army National Guard**



The vast majority of power outages associated with the December 2008 ice storm was caused by trees and branches, which toppled under the weight of the ice. Many of the trees that damaged electrical equipment were located outside of the rights-of-way wherein utilities and municipalities are allowed to trim vegetation. Tom Frantz, director of the electric utility division for the New Hampshire Public Utilities Commission, estimated that 75 to 80 percent of the trees that took down power lines were large and outside the “trim zone” where utility companies would normally cut trees or branches. “Unless you moved through the rights-of-way and took out a huge amount of trees,” Frantz said, the damage could not have been prevented. “New Hampshire’s a heavily forested state.”



“I’ve been in the public works industry in New Hampshire for almost 30 years at this point. I’ve been through a number of hurricanes, ice storms, snow storms, floods. I think the one issue here that was not clear for a number of days was the amount of damage that had occurred. If you never left your town, you didn’t know just how bad it was throughout southern New Hampshire.”

Rodney Bartlett, Director of Public Works, Peterborough



PSNH currently invests more than \$13 million a year in vegetation management to help reduce the number of tree-related outages in New Hampshire. Each year, PSNH covers 2,600 miles of roadway in its tree-trimming cycle.

# THE STORM

Meteorologists knew that New Hampshire was in for icy precipitation on December 11, 2008, but what surprised them was the sheer amount of precipitation received over a 12- to 24-hour period (more than two inches of liquid precipitation), as well as the geographical scope and endurance of the freezing rain.

Typically, winter storms in New Hampshire contain a relatively narrow geographical band with the potential for freezing rain (e.g. 10 to 20 miles wide), while the majority of areas experience snow, sleet, or rain. In this storm, the area hit by freezing rain was uncommonly large, and the freezing rain persisted for much longer—and in larger amounts—than any storm we've seen in New Hampshire for a very long time. As freezing rain quickly coated the southern half of the state, trees and branches faltered under the weight of the ice, damaging electrical equipment and causing unprecedented power outages in a very short period of time.



**“What made [this storm] atypical was two things. The amount of precipitation was very, very large; and a good chunk of that precipitation fell in the freezing rain category. We may not have seen that quantity of precipitation associated with freezing rain for quite some time. I personally have not experienced a storm like this one in my lifetime.”**

**Dr. Eric Hoffman, professor of meteorology, Plymouth State University**



**While the less-populated northern region of New Hampshire received sleet or snow, the densely populated southern tier of the state experienced several hours of persistent, heavy freezing rain. This is markedly different than the ice storm of January 1998, wherein much lighter precipitation persisted over several days, causing the most damage at higher elevations in the northern and central regions of New Hampshire.**

## PSNH'S EMERGENCY RESPONSE PLAN

PSNH coordinates its preparations for and response to power outage situations according to its Emergency Response Plan, which was developed based on the National Incident Management System.

The National Incident Management System is used by emergency responders throughout the country, including municipalities, state Offices of Emergency Management, and the Department of Homeland Security. The alignment of PSNH's Emergency Response Plan with this system allows for greater collaboration, communication, and efficiency among all emergency responders in the event of a large-scale disaster such as the December 2008 ice storm.

This storm was the first full-scale, statewide test of PSNH's Emergency Response Plan, which was executed at a more localized level during the tornado restoration effort in July of 2008. PSNH employees regularly receive emergency response training and participate in mock drills.



## PREDICTING POWER OUTAGES

**In 2005, PSNH initiated a research project with Plymouth State University meteorology professor Dr. Eric Hoffman to determine which specific sets of weather conditions (e.g. temperature, precipitation, wind speed, direction of storm) have most commonly resulted in widespread damage to electrical equipment in New Hampshire. Analysts studied ten years of local weather patterns and corresponding PSNH power outage data. The results of this analysis were used to develop a software tool that helps PSNH to predict power outages based on weather criteria.**

**On Thursday, December 11, 2008, the tool predicted that a major winter storm (i.e. the type of storm that has caused major outages in the past) was likely to hit New Hampshire. This prediction was right on the mark. However, there was no way of knowing that this storm would cause three times as many power outages as any major storm we've experienced in the past.**

## BEFORE THE STORM

On Thursday, December 11, a weather advisory was issued at PSNH in response to forecasts for a major winter storm. Using a weather modeling tool custom-designed for PSNH by Plymouth State University, PSNH determined that a major power outage event was likely to occur. In accordance with its Emergency Response Plan, PSNH issued a Level 1 Emergency Management Advisory on December 11 to begin emergency preparations for the storm.

Preparations included:

- Alerting all personnel and planning for adequate staffing
- Fueling and stocking line trucks and other emergency response vehicles with necessary equipment
- Preparing for meals and lodging for field employees
- Stocking first aid equipment, road and circuit maps, flashlights, batteries, and office supplies
- Preparing reception areas and procedures for outside crews



## MOBILIZATION & RESTORATION

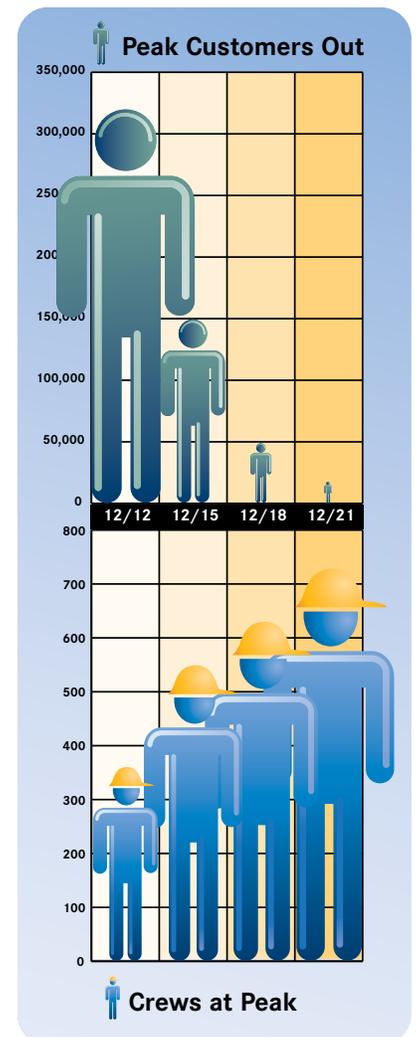
PSNH's central Emergency Operations Center (EOC) opened at approximately 11:00 p.m. on Thursday, December 11, 2008.

At that time, massive power outages were already beginning to occur. Recognizing the magnitude of the storm, PSNH immediately put out requests for help from other utilities and contract crews in New England.

Unfortunately, since the storm was impacting the entire region, many of the contract crews in the area were already committed to helping utilities to the west of New Hampshire. These utilities were given precedence under the regional Mutual Aid Agreement since they sustained damage prior to PSNH, as the storm moved west to east.

As PSNH cast a wider net to solicit help from utilities throughout the East Coast, the Midwest, and into Canada, local employees were fully mobilized to begin restoring power. Despite the efforts of more than 200 crews working statewide, the number of power outages continued to climb as gusting winds brought down trees already strained by ice. By 5:00 p.m. on Friday, December 12, more than 322,000 PSNH customers were without power.

By Sunday, December 14, more than 300 additional tree and line crews had arrived in New Hampshire to help restore power to PSNH customers. By nightfall on Sunday, crews had restored service to more than half of the customers who had lost power in the storm.



**PSNH continued to call for help from other utilities and contract crews up until the very last days of restoration, in order to restore service as quickly as possible to customers who remained without power.**

**By way of comparison, it took approximately that same amount of time—one week—to restore service to 93,000 customers following Snowstorm Bernice in 1996.**

Over the next few days, crews continued to flood in from as far away as Maryland, Ohio, and Canada. By Day 7 of the restoration effort, more than 650 line, tree, and service crews were on the ground in New Hampshire, and power had been restored to more than 275,000 PSNH customers (about 86 percent of the customers affected by the storm). By way of comparison, it took approximately that same amount of time—one week—to restore service to 93,000 customers following Snowstorm Bernice in 1996.

By Day 10, the last portion of restoration work had been completed in the Seacoast and northern regions of the state, and PSNH's restoration fleet had grown to more than 975 crews. Utility personnel flooded the southern and western parts of the state, and more than 100 local electricians were brought on board to help repair damaged wires and meter equipment at individual residences.

## **DIRECTING THE TROOPS**

**In total, over 1,200 crews from more than 40 utilities and contract companies helped to restore power to PSNH customers in the wake of the December 2008 ice storm. Effectively dispersing this massive fleet throughout the impacted communities in New Hampshire was the job of the central Emergency Operations Center (EOC) at PSNH.**

**As requests for line crews, traffic control personnel, damage assessments, downed wire guards, and other resources flooded in from field offices throughout the state, the EOC coordinated the distribution of available resources to ensure that: 1) resources were matched to the areas of greatest need, such that as many customers were restored as quickly as possible; and 2) no area that continued to experience outages was neglected.**

**PSNH's system for distributing available resources based on need was so accurate that service was restored to the hardest hit communities—including the areas served by PSNH's Derry, Milford, Keene, and Hillsboro area work centers, as well as the three satellite offices in the Monadnock region—within hours of each other. All of these operations completed restoration work on Christmas Eve.**

In the greater Monadnock region, where the damage was most severe, three additional emergency operation centers were established to direct the massive influx of crews, support staff, and equipment in the area. Satellite offices were set up at the Park Construction facility in Fitzwilliam, the Boynton Middle School in New Ipswich, and the National Guard Armory in Peterborough, NH.

In the final three days of restoration, December 22 – 24, PSNH’s fleet topped out at more than 1,200 crews, who worked around the clock to restore service to about 10,000 PSNH customers still without power. These repairs were particularly time-consuming, as most of the remaining outages were caused by damage to equipment that served just one residence or a small pocket of homes.

With thousands of utility personnel working up to the last minute, PSNH was able to restore power to more than 99.9 percent of its impacted customers by 6:00 p.m. on Christmas Eve—Day 13 of the restoration effort. Work continued through December 31, 2008 to restore power to remote camps, and other locations that are particularly difficult to reach in winter months.

### CREWS ASSISTING WITH RESTORATION EFFORT

<b>Bucket Crews</b>	<b>695</b>
<b>Tree-Trimming Crews</b>	<b>294</b>
<b>Service Crews</b>	<b>139</b>
<b>Digger Crews</b>	<b>64</b>
<b>Off-Road Vehicles</b>	<b>13</b>
<b>TOTAL CREWS</b>	<b>1,205</b>

### TYPICAL CREWS MANAGED BY PSNH STATEWIDE

<b>Bucket Crews</b>	<b>99</b>
<b>Tree-Trimming Crews</b>	<b>70</b>
<b>TOTAL CREWS</b>	<b>169</b>



## MAJOR CHALLENGES

As PSNH responded to the largest power outage in New Hampshire history, it faced a number of significant, external challenges that further complicated the restoration effort, including:

### Harsh Weather Conditions

In the heart of the restoration effort, New Hampshire was hit by two major snowstorms, including a nor'easter that dumped more than a foot of snow on the state. Although crews continued to work around the clock, the snowstorms slowed productivity. Roads were so bad that PSNH had to have chains immediately manufactured for utility trucks from Alabama and other southern states. Poor visibility and road conditions further slowed restoration by causing a number of public motor vehicle accidents, some of which involved utility poles and caused additional power outages for crews to deal with. Bitter weather and poor road conditions required utility personnel to give extra attention to safety procedures while working along roadways and other rights-of-way. Fortunately, no serious injuries occurred.



“For every truck that’s out there, with two men in it, there’s probably 10 to 15 people behind the scenes. It takes a lot of support. The storm was so devastating, we need so many vehicles in such a confined area, we have to keep them under control. We have to organize in steps, keep people in safe work areas, keep them separated. Everybody wants to get it done, but it’s too dangerous if we all just went out. From this office, in this room, we organize how we plan and strategize to attack it.”

Kevin Cote, Field Supervisor - Lines, PSNH

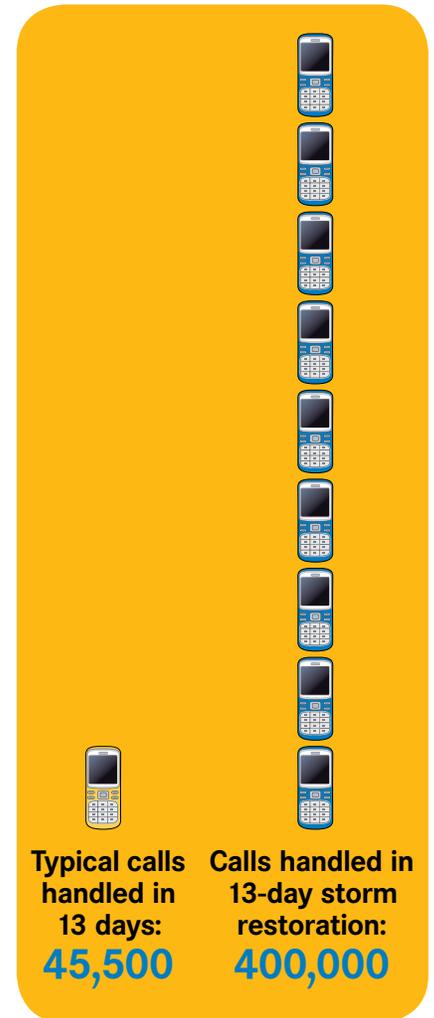


### Availability of Crews

In regional storms, the utilities that sustain damage first are also the first to receive help under the regional Mutual Aid Agreement. In a part of the country where storms typically move from west to east, this can make it harder for eastern states like Maine and New Hampshire to obtain out-of-state resources when a regional disaster occurs. In the December 2008 ice storm, many of the region's resources were already committed to helping utilities to the west of New Hampshire by the time damage began to occur in the Granite State. Fortunately, PSNH was able to cast a wider net for utility assistance and assemble an unprecedented fleet using the resources of its sister company, Connecticut Light & Power. By Day 3 of the storm restoration effort, hundreds of crews were arriving in New Hampshire from as far away as Maryland, the Midwest, and Canada.

### The Impending Holiday

As the Christmas holiday approached, pressure on utility crews to restore power increased by the day. While PSNH employees are required to work through holidays in emergency situations such as the 2008 ice storm, outside contract crews working voluntarily in New Hampshire are not bound by PSNH's direction. Although many of these contract crews were willing to work through Christmas, more than 200 contract crews left New Hampshire of their own volition in the last four to five days of restoration to get home in time for the holiday.



## ANSWERING CUSTOMER CALLS

**While crews were hard at work restoring power in the field, employees at PSNH's 24-hour call center in Manchester were busy handling hundreds of thousands of customer calls. At the peak of the storm on Friday, December 12, the call center was inundated with more than 161,000 calls in just one day. Despite the tremendous call volume, customers never received a busy signal when calling PSNH except during one 70-minute span on December 12 when more than 27,000 calls flooded in at the same time.**

Throughout the 13-day restoration effort, more than 400,000 calls were handled by PSNH's call center (four months' worth of calls under normal conditions).

“I want to thank the people of New Hampshire who were so kind to the line crews who worked 16-hour shifts to restore your service. My son told me of numerous coffees, cookies, and doughnuts—and the couple in Ipswich who brought him and his partner turkey sandwiches. He added, ‘Mom, he said it was all they had, but they wanted to bring us something!’ Now that’s the spirit of Christmas!”

**Jan Porri, mother of a CL&P line worker  
who helped restore service in NH**

“My community of Mont Vernon, NH was devastated by the Ice Storm last Friday. My family has been forced to stay with family and friends who are lucky to have power while our home has power restored. I am amazed at the endless energy and dedication that the PSNH and supporting crews have demonstrated while some of their own homes are still without power. I would like to extend our heartfelt thanks for the excellent job you all are doing to bring everyone back on-line.”

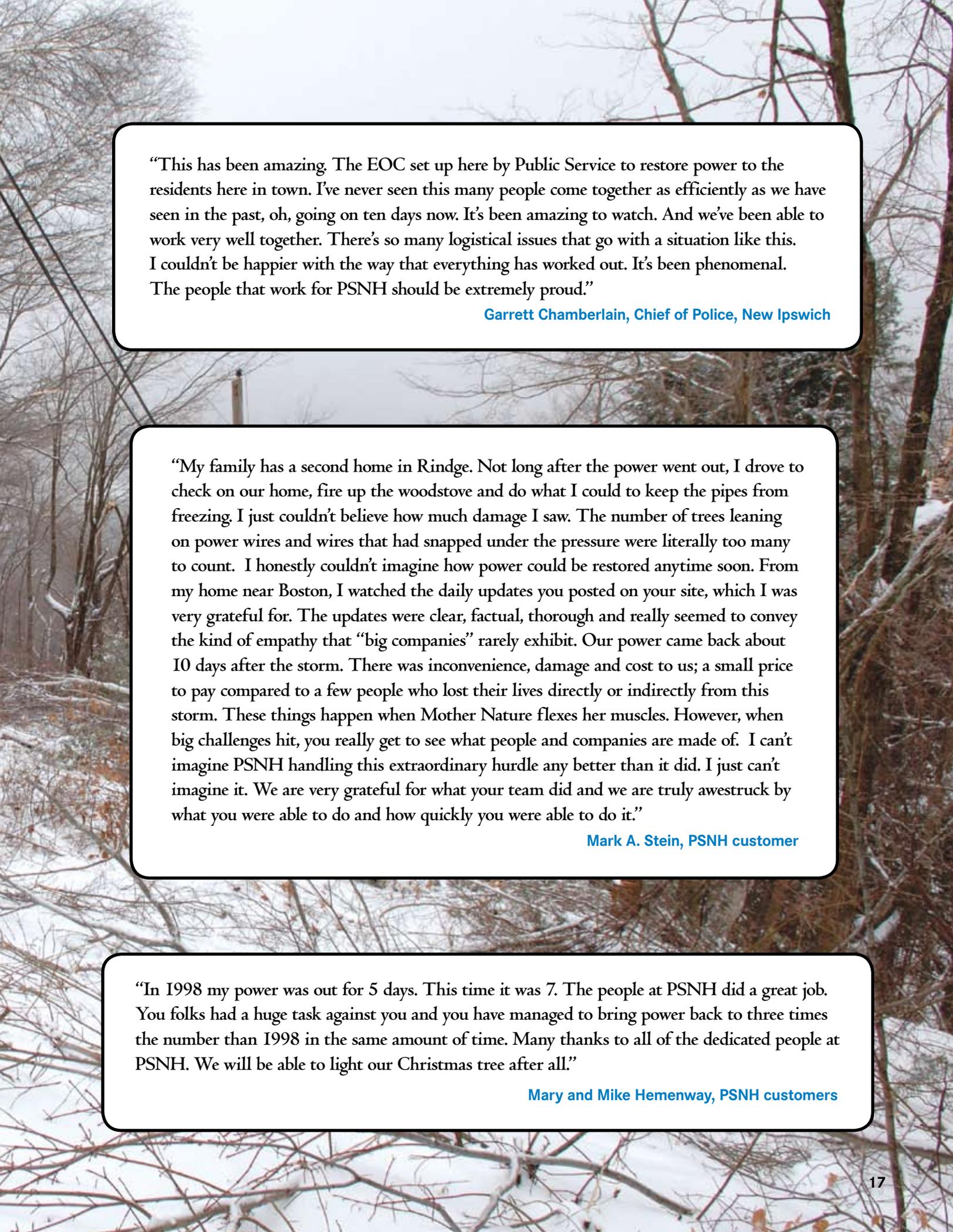
**Scott Bailey, PSNH customer**

“I have been without power since Thursday night. Your line crews (local crews or at least local trucks) got me online tonight in Milton. I want to thank you not just for my restoration, but for the amazing efforts your line crews put forth all the time. As a volunteer firefighter, I am often amazed at the fast response times when we need help to make a dangerous situation safer for us with a house fire or car vs. pole. In this storm your crews have gone from their families for extended periods of time and done an amazing effort. Thanks for all you do!”

**Mike Walsh, PSNH customer**

“The guys that are out there working the 16-hour days to try and get this back on, in this cold—and it’s cold out now—it gives you a different appreciation, even for me, having worked here for 33 years.”

**Greg Crotto, State Command Sgt. Major, NH Army National Guard**



“This has been amazing. The EOC set up here by Public Service to restore power to the residents here in town. I’ve never seen this many people come together as efficiently as we have seen in the past, oh, going on ten days now. It’s been amazing to watch. And we’ve been able to work very well together. There’s so many logistical issues that go with a situation like this. I couldn’t be happier with the way that everything has worked out. It’s been phenomenal. The people that work for PSNH should be extremely proud.”

**Garrett Chamberlain, Chief of Police, New Ipswich**

“My family has a second home in Rindge. Not long after the power went out, I drove to check on our home, fire up the woodstove and do what I could to keep the pipes from freezing. I just couldn’t believe how much damage I saw. The number of trees leaning on power wires and wires that had snapped under the pressure were literally too many to count. I honestly couldn’t imagine how power could be restored anytime soon. From my home near Boston, I watched the daily updates you posted on your site, which I was very grateful for. The updates were clear, factual, thorough and really seemed to convey the kind of empathy that “big companies” rarely exhibit. Our power came back about 10 days after the storm. There was inconvenience, damage and cost to us; a small price to pay compared to a few people who lost their lives directly or indirectly from this storm. These things happen when Mother Nature flexes her muscles. However, when big challenges hit, you really get to see what people and companies are made of. I can’t imagine PSNH handling this extraordinary hurdle any better than it did. I just can’t imagine it. We are very grateful for what your team did and we are truly awestruck by what you were able to do and how quickly you were able to do it.”

**Mark A. Stein, PSNH customer**

“In 1998 my power was out for 5 days. This time it was 7. The people at PSNH did a great job. You folks had a huge task against you and you have managed to bring power back to three times the number than 1998 in the same amount of time. Many thanks to all of the dedicated people at PSNH. We will be able to light our Christmas tree after all.”

**Mary and Mike Hemenway, PSNH customers**



From the moment that PSNH’s Emergency Operations Center was activated, PSNH began issuing regular, proactive updates in order to keep the public as informed and safe as possible during the storm restoration effort. Updates were issued through email and posted on PSNH’s website around-the-clock beginning at 4:30 a.m. on December 12 and continuing through 5 p.m. on December 23. These updates reflected the best information available at the time, and responded to time-sensitive issues such as weather-related hazards.

As soon as reliable information was confirmed from the field, PSNH also began publishing a “Restoration Estimates by Town” report once a day to help customers better plan for when their electricity would come back on. Information on each community was gathered directly from the local Incident Commanders in the field each day to ensure that information was accurate, and to avoid propagating unconfirmed restoration times.



## THE DEMAND FOR INFORMATION

Throughout the 13-day restoration effort, PSNH responded to media requests 24 hours a day, accommodating hundreds of media interviews and arranging for footage to be taken at dozens of locations in the field. In addition to frequent interviews with local media, PSNH was contacted by national media outlets, including the *New York Times* and CBS and ABC News. Several Canadian broadcast outlets also contacted PSNH, including the CBC, CBT, and the *Montreal Gazette*.

To help meet this unprecedented demand for information, PSNH issued regular and frequent notices to the media through a variety of sources. A separate Web page was developed on the psnhnews.com Internet site, which was populated with links to all updates, reports, and other storm-related information. During the restoration period, PSNH also produced six videos and a podcast to help explain the restoration process and the unique weather conditions that caused the mass power outages. These videos were viewed more than 17,000 times during the course of restoration.

A Web-based tool called “Twitter” was also used by PSNH to send and receive short bursts of information via the Internet and cell phones. Within days of the storm, the number of subscribers “following” PSNH’s Twitter posts increased from 100 to about 1,900. Many subscribers found PSNH’s posts especially useful since they did not have electricity, but they were able to get information on their phones via Twitter.

To reach as many customers as possible, PSNH made use of a variety of information outlets to share storm-related news and information. PSNH worked with local and national media outlets; posted updates, photos, videos, and podcasts on the Web; and interacted directly with customers through social media tools such as Twitter.

## TARGETED OUTREACH

To help facilitate communication with the State, dedicated resources at PSNH were assigned to provide around-the-clock information to the Office of Emergency Management and the New Hampshire Public Utilities Commission, and to respond quickly to requests for information. PSNH officers and senior management also participated in planning and reporting sessions with Governor Lynch and other state officials.

At the community level, PSNH dedicated resources to provide regular updates to municipal officials and emergency response organizations.



“I want to thank PSNH for the wonderful job it is doing. Thank you for your hard work getting us all back up and running and for the thorough updates you’ve provided about your progress. The power was restored to my home this afternoon. During my family’s four days without heat and electricity, I really appreciated all of the information you provided through your website. Please keep up the fantastic work. You deserve much credit for the way you are handling this difficult situation.”

Melissa Mannon, PSNH customer

## **RESPONDING TO EMERGING ISSUES**

One of the key roles of PSNH's communication efforts during the storm restoration was to support the safety of the public and utility personnel.

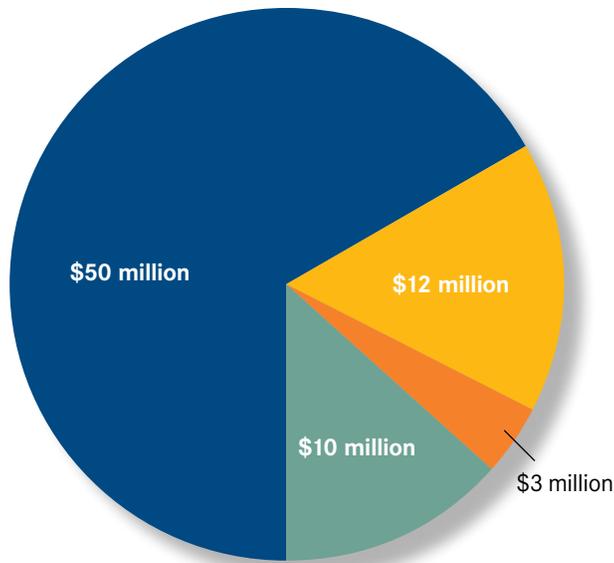
When two major snowstorms hit New Hampshire in the heart of restoration work, PSNH used its established communication outlets to urge motorists to stay off the roads if possible, and to slow down when driving past crews working alongside roadways. PSNH also worked with the State Fire Marshall to develop and distribute a Public Safety Announcement to share basic generator safety information and prevent carbon monoxide poisonings. Notices were also issued to remind the public to stay away from downed wires and electrical equipment, and to call PSNH if they found damaged equipment on their property.

**One of the key roles of PSNH's communication efforts during the storm restoration was to support the safety of the public and utility personnel.**



## ECONOMIC IMPACT

The 2008 ice storm was unlike any major storm New Hampshire has ever experienced. A significant amount of resources was spent in order to repair the state’s electrical system and restore power to customers.



### Total cost of labor and materials = Estimated at \$75 million

- To be recovered from customers over time to-be-determined by regulators
- Capital costs (permanent equipment replacement): to-be-recovered long term
- Anticipated insurance payout
- Storm reserve account funds



## PAYING FOR STORM COSTS

PSNH will recover the costs associated with the ice storm restoration using a combination of sources, including PSNH’s “Storm Reserve” account. A portion of the costs will also be covered by insurance. The policy has a deductible of \$10 million and a payout limit of \$15 million. Any costs that are not paid by the Storm Reserve funds or the insurance policy will be recovered over a period of years to be determined by state regulators.

## RATE IMPACT EXAMPLE

The recovery of \$50 million over five years, for example, and \$10 million in capital costs over 30 years, would add about \$1.00 to the monthly bill of a PSNH residential customer using 500 kilowatt-hours per month.

**PSNH learned many valuable lessons throughout the ice storm restoration. In particular, this storm confirmed for PSNH that:**

### **PSNH'S RESTORATION PROCESS WORKS REGARDLESS OF SIZE**

Based on the National Incident Management System, PSNH's emergency response approach is designed to expand or contract based on the size of the emergency situation. The July 2008 tornado successfully tested PSNH's Emergency Response Plan at a localized level. The December 2008 ice storm proved that PSNH's plan can be expanded to respond with speed and agility to the most widespread and devastating disasters that impact our state.

### **PSNH BENEFITS FROM A HIGHLY EXPERIENCED WORKFORCE**

The employees who responded to the worst ice storm in New Hampshire's history not only made heroic efforts and dedicated many long hours to the restoration effort, they also brought to the table decades of experience responding to storms and other emergency situations. PSNH's highly experienced workforce and leadership team was buoyed by hundreds of retirees and employees from PSNH's parent company, Northeast Utilities, who provided valuable expertise and helped to meet critical staffing needs.



### **MUNICIPAL AND STATE PARTNERS STEP UP**

PSNH has found that the most effective way to attack restoration work is from the ground up, with our decentralized restoration centers coordinating local efforts in collaboration with municipal fire, police, rescue, and public works personnel. In every community that was impacted by this storm, our municipal partners went out of their way to support PSNH in a unified restoration effort to protect the public and restore power as quickly as possible.

The state Office of Emergency Management (OEM) also stepped up to support municipal and utility efforts. The OEM provided helicopter transportation from the New Hampshire State Police organization for use in patrolling PSNH's power lines; facilitated the border crossing for line crews coming to our aid from New Brunswick and Quebec; provided lists of road closings; facilitated and enabled more than 50 National Guardsmen to act as flaggers with our utility crews, and much more.

To help speed this time-consuming process, PSNH hired more than a hundred electricians to help repair damage to individual meter boxes and/or the point of attachment on a customer's home.

### LOCAL ELECTRICIANS CAN ASSIST PSNH CREWS

PSNH is unique among utilities in New Hampshire in that it is responsible for service restoration to the meter. Customers of other electric utilities may have to hire private electricians to repair damage from the point of connection to the house and to the meter itself. In contrast, PSNH's policy is to repair all service drops for its customers as part of its storm restoration effort.

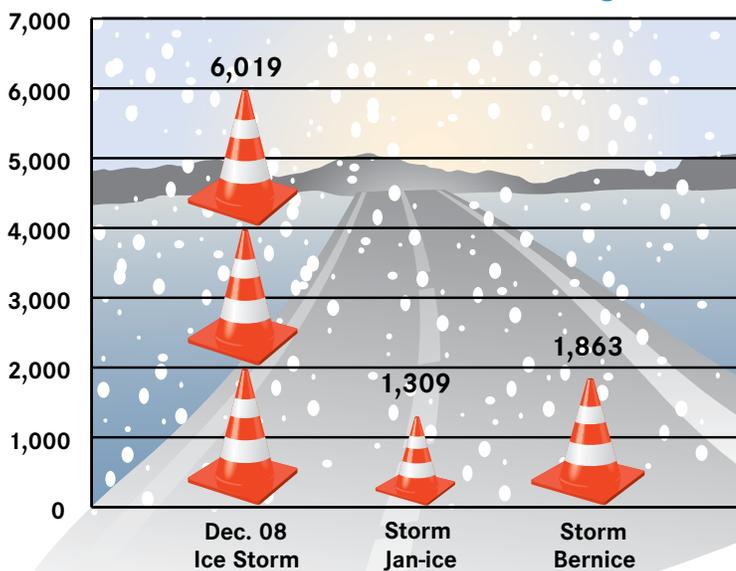
To help speed this time-consuming process, PSNH hired more than 100 local electricians to help repair damage to individual meter boxes and/or the point of attachment on a customer's home. By the last few days of restoration, PSNH had more than 135 service crews working to repair equipment on customers' property. This approach allowed PSNH to reserve highly qualified line crews for bigger jobs like restoring primary lines, and it resulted in the restoration of power days earlier than would have been possible relying exclusively on utility crews to repair damaged equipment.

### REDUNDANCIES ARE VITAL IN THE SUPPLY CHAIN

Supplying crews with the materials they needed to reconstruct major sections of the electric system was a huge job in itself. In 13 days, PSNH personnel traveled over 17,000 miles to make more than 250 bulk deliveries to crews restringing power cable, installing fuses, and replacing transformers at an unprecedented rate throughout New Hampshire. Keeping up with this

incredible demand for materials would not have been possible without a high level of redundancy in PSNH's supply chain. PSNH itself stocks 3 - 4 months worth of inventory at its own facilities, and its vendors stock another 2 months of back-up inventory for PSNH at their facilities. As these resources were being depleted during the restoration effort, manufacturers of individual items were called on to make sure that PSNH's fleet of 1,205 crews had everything they needed to continue working around the clock to restore power.

Number of Troubles in December 2008 Ice Storm vs. Number of Troubles in Other Big Storms



A "trouble" is a section of the electric system that requires repair. a single trouble can be as small as a service line detached from the side of a home (secondary trouble), or as large as a 10-mile stretch of poles and wires completely knocked to the ground (primary trouble). The troubles shown in this graph are primary troubles only.

## **SATELLITE CENTERS INCREASE COORDINATION AND EFFICIENCY**

In the first few days of storm restoration, PSNH became increasingly aware of the severity of damage in the western part of the state as detailed damage assessments were completed. There were very few line or tree crews available in that area early on, so plans were made to flood that area with resources as soon as they were freed up from other commitments.

To help coordinate this massive operation, three additional emergency operation centers were established in the greater Monadnock region. As restoration work was completed at PSNH's area work centers in other parts of the state, entire operations were closed down and then re-opened within 12 hours at these satellite locations. By Monday, December 21, more than 600 line, tree, digger, and service crews had flooded the greater Monadnock region. By comparison, that region typically staffs just four line crews on a normal day. The satellite offices allowed PSNH to attack restoration work from three additional locations in the region, and to spread out its resources more efficiently to speed the restoration of power.

## **TREE TRIMMING CONTINUES TO BE VITAL**

This storm reaffirmed for PSNH that tree-trimming must be performed regularly and aggressively to protect public safety and improve the reliability of our electric system. In a state where 84 percent of the land is blanketed in trees, vegetation management is vital to preventing storm-related power outages. PSNH encourages policymakers to support measures that would give utilities more leeway in maintaining public rights-of-way, in order to make them safer for the citizens of New Hampshire.



**Emergency situations like the December 2008 ice storm reaffirm the strength of the human spirit. Under the most challenging of circumstances, the people of New Hampshire came together to respond to this unprecedented natural disaster with resourcefulness, resiliency, and compassion.**

**This experience made a profound impression on PSNH employees—one that will stay with us for many years to come.**

*This report was prepared at stockholders expense.*



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The Northeast Utilities System