

- 1. Please provide the company's current emergency management plan in an electronic .pdf format.**

Please see following Attachment Question #1.

2. How often does your company update its emergency management plans?

As a standard practice, NHEC's emergency restoration plan is reviewed and updated annually. If, during the year a better business practice or other lesson learned is significant enough to incorporate into the plan, NHEC will modify the plan to incorporate the new practice to benefit future restoration efforts.

3. Please provide the process that is used to update your emergency management plan.

NHEC performs a storm critique after each major event with all key participants and those district centers impacted to ensure we have a thorough understanding of any issues that arose. Any information that leads to better practices is examined to see if it warrants a change or modification to NHEC's Emergency Plan; if so that is incorporated into the plan.

4. Who participates in the development of your emergency management plan? Please include details on the approval process.

All of NHEC's employees contribute to the emergency plan along with outside line and tree contractors. Their recommendations are evaluated by the Disaster Recovery Executive, and then reviewed with the Vice President of Operations and Engineering. When it is determined by management that a new initiative will benefit the emergency plan it is included.

5. Does your company subscribe to any professional weather forecasting services?

- a) If yes, please provide the name or names of the company or companies.
- b) Please also provide how long your company has subscribed to the service.
- c) Please provide a description of the services provided to your company.

NHEC does not subscribe to any professional weather forecasting services. There are a number of on-line services available that provide an abundance of weather data including local news stations and New England News Networks as well as National Weather Service. Weather is constantly monitored in the Co-op's Plymouth Control Center.

6. If your company does not subscribe to any professional weather forecasting services, please provide a detailed explanation why it does not.

NHEC did subscribe to a service several years ago. Through experience with this provider we subsequently found the services provided from the company could be accessed on the internet for free.

There are a number of on-line services available that provide an abundance of weather data including local news stations and New England News Networks as well as National Weather Service. Weather is constantly monitored in the Co-op's Plymouth Control Center.

7. Please provide all weather data and forecasts your company received and/or used on each of the following dates: December 9, 10, 11, and 12.

This data was not recorded.

The data that was utilized was derived from local and national weather forecast available on the internet and cable TV. This data was monitored on a regular basis in the Co-op's Plymouth Control Center and by the Disaster Recovery Executive, Vice President of Operations and Engineering as well as district offices.

8. Please describe the process used to alert personnel within your company about the possibility of the December 2008 ice storm.

On December 10th at 6:25 AM the Disaster Recovery Executive issued the following statement via email to all NHEC staff: Updates of the storm progress continued until the event was over.

*Good morning everyone,
 Another winter and more storms to deal with. A winter storm watch remains in effect from Thursday evening through Friday afternoon. The potential exists for heavy snowfall of 6 inches or more in the mountains and foothills while southern areas may receive significant amounts of freezing rain and some sleet.
 A winter storm watch means there is a potential for significant snow, sleet, or ice accumulations that may impact travel. I will keep you posted as the storm gets closer and in the mean time please review your department's storm check list.*

A response was sent back from managers and supervisors identifying those employees who were and those who were not available for storm duty. Also, at this time supervisors ran through their emergency check lists for materials, fuel, and equipment to ensure they are well supplied and ready. The fleet and garage foreman provided a list of vehicles by type that are out of service and also what was available for spare vehicles.

Please see example of request for resource information table below. This table representing the Meredith District would be submitted back to the Disaster Recovery Executive detailing available resources.

NHEC Employee Availability for Storm Trouble
 Predicted Storm Date

Meredith District	Available Y-N	Vac	Sick	Other Explain
Cornelissen, Dan				
Davis, Don				
Davis, Ron				
Devine Ryan				
Lyle, Charles				
Maineri, Josh				
Nedeau, David				
Quinn, Luke				
Skilling, John				
Taylor, Mark				
Winsor, Don				

9. Please describe in detail the process used to determine the resource needs of your company for a major restoration event.

When a major storm event is being experienced the affected districts assign trained employees to assess the line damages in the field and to also report on the access to the lines. The assessment is critical to any restoration effort. This field information along with the Outage Management System (OMS) data collectively paint the picture of T&D conditions and enable staff to determine the number and type of resources that will be needed to restore power quickly, efficiently, and safely. The OMS is utilized as a first good indicator of potential damage which triggers the need for resource assessment in the field. The years of operating experience of the District Supervisors and the Disaster Recovery Executive also play a significant role in determining what resources are needed.

10. Please describe the activation process of command centers, work centers, and staging sites. Please indicate the timeframe of the activation in relation to anticipated impact of the December 2008 storm.

NHEC has a Control Center which is located at the Plymouth Campus and is staffed 24/7/365. This center is responsible for notifying the Disaster Recovery Executive or his designee of any impending early storm events. In addition, if the weather forecast indicates a potential problem, there is extensive dialogue between the Disaster Recovery Executive and the VP of Operations & Engineering to determine when to prepare for resources beyond NHEC employees, such as putting contractor and material supply resources on stand by.

During the early hours of the December 2008 storm a call was received and the Emergency Operations Center (EOC) was staffed until all power was restored. Also, NHEC has 10 operating districts (plus the Town of Wolfeboro who we contract our services to) each having line workers who provide the on call service 24/7/365. When outage calls are received at the Plymouth Control Center the line workers on call are NHEC first responders. As standard practice, when outage calls are too numerous for one crew, additional crews are called in to work. In the case of the December 2008 storm the number of outages required district staffing at our Plymouth, Sunapee, Ossipee, Meredith, Alton and Raymond districts by the morning of December 12th.

Contract crews were put on notice prior to the event actually occurring which included line and tree contractors.

11. Please describe the training in-house employees receive concerning outages and restoration.

Training is performed on an annual basis at a level dependant on the position. As an example a seasoned Line Assessor would not require the same level of training as a new District Office Support individual. All NHEC employees have assigned storm duties and many are cross trained depending on their field knowledge, district office and distribution system familiarity and other relevant job experience.

The training on the OMS system is continuous in order to maintain an acceptable level of operational proficiency. Since the OMS is a relatively new system with other great benefits to NHEC we continue to provide extensive ongoing training to key personnel in order to be able to respond across our system.

The Plymouth Call Center, Bird Dogs (individuals that move crews around the system in impacted districts), Line Assessors (individuals that assess line damage), District Office Support (back room operations), District Field Support and Warehouse Support receive annual training for their specific storm assignments. The new employees or present employees who progress and have a change in their work assignments are assigned a person to partner with/shadow in order to strengthen job knowledge and prepare them for new duties.

12. Please describe training requirements for contract employees and those used in mutual aid agreements (if different than those for in-house); include frequency, duration, location, written records and names of trainers.

NHEC does not train contract line crews or tree contractors; we have contractual agreements with these contractors which specifically addresses the requirement for qualified workers.

The Mutual Aid Agreement is the same and all training is the responsibility of the representative companies.

13. Please include a break-out of field personnel as well as support personnel, with responsibilities and duties for each in an outage and restoration scenario.

Disaster Recovery Executive:

The Disaster Recovery Executive or their designee will manage this position when necessary to manage extended and major outages. The duties of this position are to manage the overall restoration activities until all NHEC members have power restored. This includes internal and external staffing, meals, accommodations, and family assistance.

Public Relations:

Several key employees are trained to communicate with all types of news media during any type of emergency. These include, but are not limited to: PR/Marketing Manager, Communications Administrator, Member Solutions Manager, Special Projects Administrator and all of Senior Management. NHEC also utilizes a public relations firm to aid in disseminating critical information.

Call Center:

These are either full or part-time call center employees or other trained NHEC employees who can perform call takers duties when needed. During extended or major restoration times rotating shifts are required for these workers.

District Dispatching:

NHEC employees who over the years have learned outage restoration practices and can provide assistance to district supervisors as needed.

Control Center:

NHEC's operations coordinators presently man the Plymouth Control Center for outages unless requested by a district to turn over the responsibility to them. The current operations coordinators could be reassigned for various field or district assignments when necessary.

OMS Operators

These are NHEC employees who have been train to operate the Outage Management System (OMS) and when required are assigned to districts seriously impacted with outages to maintain the district outage status remotely as directed by the local supervisor.

Bird Dogs:

These are NHEC employees, previous employees or trained contractors who are knowledgeable enough about NHEC's distribution system to troubleshoot and guide crews to outage locations.

Field Assessment:

NHEC employees, previous employees or trained contractors who are knowledgeable enough about NHEC's distribution system to assess storm damage, fill out damage reports and communicate back about the damage to the dispatching authority.

General Support Office:

NHEC employees who can assist with storm documentation; tracking crew times; making meal, room and laundry arrangements, etc.

General Support Field:

These are NHEC employees with system knowledge who can assist with sorting outage tickets, updating district outage statistics, updating crew compliment, etc.

Secondary Service Helper:

These are NHEC employees who have electrical experience and can assist with connecting secondary services.

IT Help:

Help desk is available to assist with any equipment problems. *i.e.* printers, faxes, and scanners.

IT Applications:

For any systems/applications support.

Safety:

Support for any area of concern during restoration efforts. The Safety Manager monitors all situations and provides a physical presence as needed.

Finance:

Ensures any necessary funding requirements and emergency funding allocations are met to provide for restoration efforts and tracks expenses.

Vice President of Operations and Engineering:

The responsibility of this position is to work with the Disaster Recovery Executive. In addition it is the role of this individual to provide local and state government offices and officials information on the restoration effort.

Senior Management Team:

President/CEO, Executive Vice President of Strategy & Governmental Relations, CFO/Vice President of Corporate & Member Services, Vice President of Operations & Engineering, Vice President of Power Resources & Access. Any member of the team plays the role of Incident Commander.

District office personnel consist of Operations Supervisors or District Representatives who manage the daily activities and the line crews who perform the field restoration services as part of their job responsibilities.

14. Please provide your company's definition of and job description for the following:

- d) line crew;
- e) tree trimming crew;
- f) bucket crew;
- g) digger crew.

Please see attached Job Descriptions for

- 1. Utility Arborist Supervisor
- 2. Utility Forester Coordinator
- 3. Lineworker - First Class - Rubber Glove

NHEC does not maintain job descriptions for bucket crew & digger crew - these responsibilities are all inclusive in the Lineworker – First Class – Rubber Glove Description and are a requirement to be able to perform these duties.

NHEC does not employ tree trimming crews in our organization; tree and ROW work is subcontracted. NHEC employs a right of way supervisor, and two utility forester coordinators that oversee and manage the contractor tree crews.

15. Please provide the number of crews employed full-time by your company for each of the following years: 2004, 2005, 2006, 2007 and 2008, differentiating numbers for internal and contract crews for each of the following:

- a) line crews -
- b) tree trimming crews
- c) bucket crews
- d) digger crews

Our Lineworker 1st Class - Rubber Glove performs all duties associated with linework, bucket and digger work. The breakdown of employees in that capacity is as follows;

NHEC Line Crews

2004 - 3 Working Foremen, 59 Lineworkers

2005 - 4 Working Foremen, 57 Lineworkers

2006 - 4 Working Foremen, 55 Lineworkers

2007 - 4 Working Foremen, 55 Lineworkers

2008 - 4 Working Foremen, 55 Lineworkers

Contract Line Crews

2004 - Not available

2005 - Average 8 crews

2006 - Average 6.5 crews

2007 - Average 6.5 crews

2008 - Average 4 crews

Tree Trimming crews are comprised of 2 - 3 individuals. We use contract crews for this work and we have NHEC Utility Foresters coordinate the work.

Contract Tree Crews

2004 - 16 Tree Crews

2005 - 16 Tree Crews

2006 - 16 Tree Crews

2007 - 18 Tree Crews

2008 - 17 Tree Crews

16. Please provide a general description of the obligation of contract crews for storm restoration.

Right of Way crews working maintenance for NHEC are obligated to shift their maintenance assignments to storm restoration for NHEC and are only released by NHEC when they are no longer needed for our restoration effort. Their obligation is to take direction from NHEC during these events pertinent to tree cutting, clearing and any other forestry related services NHEC needs during such an event.

When Right of Way crews are contracted and assigned for storm assistance they are to accomplish their respective duties safely and to NHEC Right of Way established specifications. Specifications pertain to trimming practices only relative to distances of ROW to be cleared or trees to be felled. This does not exclude them from performing additional duties such as traffic control, unloading materials, equipment and assisting other crews. They are obligated to follow the direction of the person in charge to perform any duties requested until the need is met.

The same is applicable for line contract crews; the only difference is that their efforts are centered on electrical line maintenance and construction.

17. Please provide any restrictions or enhancements from labor contracts that are included in restoration planning efforts.

Our labor contract incorporates a set timeframe/rotation of allowable work hours to be performed on a continuous rolling basis until the event is cleared. No individual will be allowed to work beyond 24 hours without an 8 hour rest period. This also pertains to all contract crews as well as NHEC office and other field support personnel.

18. Please describe use of electrician crews, either in-house or external, in expediting restoration times. If electricians were used, please state how many were used and on what dates, the number of meter posts restored, weatherheads reinstalled, or service drops they assisted with, and any other pertinent metrics including estimated hours/expenses incurred and estimated hours saved in utility crew time.

NHEC utilized in house electricians and other licensed and field experienced employees to follow up on service orders which identified service problems at member's homes. Their assignment was to field check each reported service problem and verify that the service could be safely energized temporarily without receiving repairs or if determined unsafe the connections between the triplex and the service entrance cable were cut and the triplex rolled back to the nearest pole. The member was then notified what corrections would be required on their part before we could safely restore their service.

NHEC initiated 231 miscellaneous service orders for member's service problems for which detailed accounts of problems corrected were not kept. Also, there were many services that line crews repaired as they found them in the field that were not recorded.

Two of NHEC's licensed electricians worked primarily in the Raymond District providing restoration efforts for the members' service drops and services and also reattachment to homes in the time period of December 15th through the 19th. In addition, we have several lineworkers who are licensed electricians who performed similar work in the field.

NHEC is only responsible for attaching overhead service drops to the weatherhead so in the majority of instances there are no hours saved in utility line crew time.

19. Please provide the number of line crews, tree trimming crews, digger crews and bucket crews your company had available on December 9, December 10, December 11 and December 12. Please provide them both in total for your company and by division and area work center.

Please see responses to Questions # 15 and # 22.

20. Please provide the timeframe in which your company sought additional crews for the December 2008 ice storm. Please provide actual times and dates when you contacted outside crews, the names of the companies whose crews were contacted, and the number and types of crews requested. Please also provide a description of the internal process and criteria by which those companies were chosen.

NHEC's Emergency Operations Center was staffed by 10:00 PM on 12/11/08 and field requests were immediately received for extra line and tree crews. ICR contract line crews that were on standby status were activated. Right of Way contract crews, including Top Notch and Lucas were called in to assist.

On the morning of the 12th a request went out to the other line contractors on NHEC's approved contractor listing without any success. Calls went out for additional right of way crews and help was received from the companies of Asplund, Lewis, Evans and Keene Tree. Their responding times varied because of the unfavorable road conditions.

A call to Northeast Public Power Association (NEPPA) for mutual aid was unsuccessful because of the amount of damages experienced by those municipalities that make up the organization. Calls for assistance continued throughout the day with positive responses from:

1. Vermont - Washington Electric Co-op & Vermont Electric Co-op
2. New York - Otsego Electric Co-op, Steuben Electric Co-op and Oneida Madison Electric Co-op
3. Maine - Eastern Maine Electric Co-op

The field assessments being returned to the district supervisors during the day Friday, the 12th and Saturday, the 13th indicated that more crew line crews would be needed to expedite the restoration process and contact was made with the Pennsylvania Rural Electric Statewide Association and 6 crews were received from the following Co-ops: Allegheny, Adams, United and Northwestern. These last crews arrived early Monday morning (the 15th). The companies chosen have a positive work

history with NHEC or are part of the Cooperative network and will always respond if they have crews available.

The ROW crews work on the NHEC system year round and have a working relationship with NHEC in the field and district offices.

Assisting crews began arriving over the weekend (December 13th & 14th) as indicated in the following table. All assisting crews had reported to their assigned locations and were working by Monday morning.

Cooperative	Arrival/Start Date
Otsego Electric Cooperative, Inc.	12/13/2008
Eastern Maine Electric Cooperative, Inc.	12/14/2008
Steuben Rural Electric Cooperative, Inc.	12/13/2008
Oneida-Madison Electric Cooperative, Inc.	12/13/2008
Washington Electric Cooperative, Inc.	12/13/2008
Vermont Electric Cooperative, Inc.	12/12/2008
Adams Electric Cooperative, Inc.	12/14/2008
United Electric Cooperative, Inc.	12/14/2008
Northwestern Electric Cooperative, Inc.	12/14/2008

21. Please provide the timeframes in which mutual aid companies confirmed that crews were available and line crews actually began working in the field on the distribution /transmission system (include travel time, quartering time, training time and other time periods that are required before start time). Please provide breakdowns by company and crew.

The confirmed times were not always received promptly, several companies were dealing with their own outages and directions were given of where to report to in New Hampshire when they could respond. Again, all assisting crews were working on NHEC lines by Monday morning, the 15th.

Cooperative	Start Date	Start Time Travel	Start Time Date	Start Time Work
Otsego Electric Cooperative, Inc.	12/13/2008	5:00 AM	12/13/2008	2:00 PM
Eastern Maine Electric Cooperative, Inc.	12/14/2008	6:00 AM	12/14/08	5:00 PM
Steuben Rural Electric Cooperative, Inc.	12/13/2008	5:00 AM	12/13/2008	2:00 PM
Oneida-Madison Electric Cooperative, Inc.	12/13/2008	5:00 AM	12/13/2008	2:00 PM
Washington Electric Cooperative, Inc.	12/13/2008	4:00 AM	12/13/2008	8:00 AM
Vermont Electric Cooperative, Inc.	12/12/2008	10:00 AM	12/12/2008	3:00 PM
Adams Electric Cooperative, Inc.	12/13/2008	6:00 PM	12/14/2008	8:00 AM
United Electric Cooperative, Inc.	12/13/2008	6:00 PM	12/14/2008	10:00 AM
Northwestern Electric Cooperative, Inc.	12/13/2008	6:00 PM	12/14/2008	10:00 AM
Allegheny Electric Cooperative, Inc.	12/13/2008	6:00 PM	12/14/2008	10:00 AM

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22. Please provide the total number of crews available for each day of the December 2008 ice storm starting on December 11 and ending on the last day of restoration. Please break out the crews by line service crews, bucket crews, tree trimming crews and digger crews and other (describe). Please indicate whether the crews were the company's own crews, those of an affiliate or an outside contract crew.

	12/11				12/12				12/13			
	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews
Alton	3.5	2		1	3.5	2		1	4.5	2	1	2
Andover	2.5				2.5				2.5		2	
Meredith	5	2		2	5	2		2	5	3	1	3
Ossipee	3.5	1		1	3.5	1		1	5	1		1
Plymouth	5.5	1			5.5	1			5.5	1		
Raymond	5	4	3	4	5	4	3	4	4	6	5	4
Sunapee	2.5	1	2	6	2.5	1	2	6	3.5	3	4	5
Totals	27.5	11	5	14	27.5	11	5	14	30	16	13	15
	Total by day			46.5	Total by day			46.5	Total by day			58

	12/14				12/15				12/16			
	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews
Alton	8.5	2	1	3.5	10	3	2	3.5	9.5	1	4.5	3.5
Andover	2.5		2	0	2.5		0	0	0		0	0
Meredith	2.5		0	0	1.5		0	0	1.5		0	0
Ossipee	1.5		0	0	0.5		0	0	0.5		0	0
Plymouth	1.5		0	0	3		0	0	2.5		0	0
Raymond	4	8	9	5.5	4	8	16.5	8	9.5	12	17.5	11.5
Sunapee	7	3	4	5	6.5	3	4	6	9	3	4	3
Totals	27.5	13	16	14	28	14	22.5	17.5	32.5	16	26	18
	Total by day			57.5	Total by day			68	Total by day			76.5

	12/17				12/18				12/19			
	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews
Alton	3	1			3	1			2	1		
Andover	2.5				1.5				1.5			
Meredith	1.5				1.5				2.5			
Ossipee	0.5				0.5				0.5			
Plymouth	2.5				2.5				2.5			
Raymond	18	12	22	13.5	19	9	23	11.5	19	9	12.5	11.5
Sunapee	3.5	1	1	2	1	4	0.5	0.5	0			
Totals	31.5	14	23	15.5	29	14	23.5	12	28	10	12.5	11.5
	Total by day			70	Total by day			64.5	Total by day			52

	12/20			
	NHEC Crews	Bird Dogs	Line Contract Crews	Tree Crews
Alton				
Andover				
Meredith				
Ossipee				
Plymouth				
Raymond	12	1	3.5	2
Sunapee				
Totals	12	1	3.5	2
	Total by day 12/20			18.5

NHEC crews consist of 2 - 3 lineworkers.

Bird Dogs are NHEC employees. A Bird Dog is an employee who works individually guide others to the area. ***not added in "crew" total**

23. Please describe any difficulties encountered in providing for hotel and meal accommodations for restoration workers when the public is competing for the same facilities due to power outages.

There were many challenges to providing adequate sleeping quarters and establishments that could feed the crews. Many of the establishments were in the affected area and had no power themselves. While the utilities in New Hampshire and mutual aid utilities needed accommodations, much of the general public also were not able to sustain themselves at their own residences and went to the hotels/motels until their power was restored. This resulted in crews requiring overnight accommodations to travel additional distances from their assigned work locations.

All NHEC crews as well as mutual aid and contract crews were properly housed in hotels and fed during the entire event.

24. Please describe methods used to keep crews fed during restoration efforts so as to maximize restoration work hours. Are box meals used for lunches, breakfasts, dinners in an effort to limit the travel time needed to go to area restaurants?

NHEC management declared this storm a major storm by 3:00 AM on the 12th of December which meant crews would follow the work schedule of starting each day by 6:00 AM and securing for the evening by 10:00 PM. This worked well to utilize available day light hours and provide adequate rest periods.

The crews received their breakfast first thing in the morning at available establishments, lunch consisted of drinks and box lunches either issued to the worker first thing in the morning or delivered to them at the work locations and dinners were provided at restaurants near their lodging locations. This greatly minimized travel time and allowed the crews to have a good meal at the work site and then continue the restoration effort.

Crews were given their work assignments at breakfast in order to expedite the restoration effort as well.

25. Please indicate when the company considers the last customer restored associated with the December 2008 ice storm.

The last known NHEC member to have their power restored was during the afternoon on Saturday, December 20th. That was the first time in 10 days the OMS read 0 outages for all 10 districts. Power was not restored to the seasonal cottages on the backside of Sand Pond in Unity until it was determined that the ice was safe enough to walk on. There is no road to the back side of this pond.

26. Did the company differentiate the ice storm from the weather events that occurred on December 17, December 19, and December 21, or are the outage numbers and restoration numbers reported inclusive?

The outage data was reported inclusively. No differentiation of those dates.

27. Please provide the number of damage assessment personnel used by your company during the December 2008 ice storm. Please provide their names and a description of their experience in assessing damage.

Assessment was accomplished utilizing district supervisors, line workers, line design, right of way agents, meter personnel and GIS employees who all have extensive knowledge with more than 5 years of utility experience for each person in the line design and construction units. The employees assigned to assessment also multi task i.e. bird dog, unload materials, deliver materials, deliver meals and any other duties assigned.

Job Title	Number	Average Years Experience in Damage Assessment
Operations Supervisors	4	22
District Representatives	6	25
Line Design Supervisor	1	6
Line Designers	8	17
ROW/Design Administrator	2	20
Plant Inspection Technician	2	7
Total	23	

28. Please provide a list of all transmission line outages that occurred during the December 2008 ice storm. Please be specific to line/circuit number, location, time of outage, cause and number of customers affected.

NHEC had no transmission line outages. NHEC's only transmission line, 6-miles of 115 kV transmission located in Conway, did not go out during the ice storm.

29. Please provide a list of all sub-transmission outages that occurred during the December 2008 ice storm. Please be specific to line/circuit number, location, time of outage, cause and number of customers affected.

NHEC had no sub-transmission line outages. NHEC did experience delivery point outages due to outages on suppliers 34.5 kV lines.

30. Please provide a list of all substations that were out of service during the December 2008 ice storm. Please be specific to time and cause of the substation outage as well as number of customers affected.

NHEC working with PSNH was able to remove limbs and trees from PSNH sub transmission lines, coordinate proper safety procedures, rebuild sections of 34.5KV line and ultimately energize the Alton Substation and Belmont Meter Point as well as a number of PSNH customers.

OUTAGE	SUBSTATION	TIME OFF	TIME ON	DURATION	CUST	PH	CAUSE
31382	CHESTER SUB	12/11/2008 22:13	12/15/2008 17:57	91 Hr, 43 Min	697	BC	[Ice/Sleet/Snow]
31395	DEERFIELD DP	12/11/2008 22:24	12/12/2008 1:39	03 Hr, 16 Min	1231	ABC	[Transmission Provider]
31401	RAYMOND SUB	12/11/2008 22:13	12/12/2008 1:43	03 Hr, 30 Min	1657	ABC	[Transmission Provider]
31424	CHESTER SUB	12/11/2008 23:04	12/13/2008 11:52	36 Hr, 48 Min	661	ABC	[Ice/Sleet/Snow]
31427	DERRY DP	12/11/2008 22:36	12/13/2008 4:02	29 Hr, 27 Min	935	ABC	[Transmission Provider]
31429	CHESTER SUB	12/11/2008 23:34	12/13/2008 11:56	36 Hr, 21 Min	382	ABC	[Ice/Sleet/Snow]
31461	NEW DURHAM DP	12/12/2008 0:09	12/13/2008 14:07	37 Hr, 58 Min	1476	ABC	[Transmission Provider]
31463	ALTON SUB	12/12/2008 0:09	12/13/2008 14:06	37 Hr, 57 Min	5063	ABC	[Transmission Provider]
31538	LEE DP	12/11/2008 22:39	12/12/2008 23:51	25 Hr, 13 Min	623	ABC	[Transmission Provider]
31585	CHARLESTOWN DP	12/12/2008 0:37	12/14/2008 9:39	57 Hr, 02 Min	786	ABC	[Transmission Provider]
31692	LYME DP	12/12/2008 3:58	12/12/2008 9:12	05 Hr, 14 Min	331	ABC	[Transmission Provider]
31738	BELMONT DP	12/12/2008 0:56	12/13/2008 12:24	35 Hr, 28 Min	1110	ABC	[Transmission Provider]
31782	HAVERHILL DP	12/12/2008 3:05	12/12/2008 13:16	10 Hr, 11 Min	585	ABC	[Transmission Provider]
31814	MEREDITH SUB	12/12/2008 4:59	12/12/2008 11:55	06 Hr, 57 Min	3757	ABC	[Transmission Provider]
31927	CENTER HARBOR	12/12/2008 2:55	12/12/2008 12:14	09 Hr, 18 Min	5363	ABC	[Transmission Provider]
31954	CORNISH DP	12/12/2008 7:11	12/13/2008 15:00	31 Hr, 49 Min	494	AB	[Transmission Provider]
32105	DEERFIELD DP	12/12/2008 1:42	12/13/2008 18:26	40 Hr, 44 Min	73	ABC	[Transmission Provider]
32625	CHESTER SUB	12/13/2008 11:56	12/16/2008 8:38	68 Hr, 42 Min	382	ABC	[Ice/Sleet/Snow]
33070	CHESTER SUB	12/14/2008 16:12	12/16/2008 16:48	48 Hr, 36 Min	1276	ABC	[Ice/Sleet/Snow]
33451	BRENTWOOD DP	12/15/2008 18:03	12/15/2008 18:59	00 Hr, 55 Min	41	A	[Transmission Provider]
33455	BRENTWOOD DP	12/15/2008 18:54	12/16/2008 14:03	19 Hr, 09 Min	178	BC	[Transmission Provider]
33462	BRENTWOOD DP	12/15/2008 20:42	12/16/2008 14:09	17 Hr, 27 Min	94	A	[Transmission Provider]
33541	CHESTER SUB	12/13/2008 11:51	12/16/2008 16:50	76 Hr, 58 Min	416	ABC	[Ice/Sleet/Snow]
33549	CHESTER SUB	12/16/2008 8:52	12/18/2008 9:11	48 Hr, 19 Min	359	ABC	[Ice/Sleet/Snow]
33690	CHESTER SUB	12/14/2008 10:20	12/17/2008 11:55	73 Hr, 36 Min	471	ABC	[Ice/Sleet/Snow]
34042	CHESTER SUB	12/19/2008 20:39	12/20/2008 10:43	14 Hr, 04 Min	661	ABC	[Ice/Sleet/Snow]
34263	CHESTER SUB	12/20/2008 8:50	12/20/2008 10:45	01 Hr, 55 Min	656	ABC	[Other]

31. Please provide for the years 2002–2008 the total number of transmission and sub-transmission circuit miles by voltage class (i.e., 345 kV, 115 kV, 69 kV or 34.5 kV).

Line Designation	Voltage (kV)	Length (miles)
Perkins-Intervale 601-Line	115	6.7
Perkins-Intervale 520-Line	34.5	6.7
Intervale-Glen 521-Line	34.5	1.9
Intervale-Glen 520-Line	34.5	2.5
Glen-Bartlett 524-Line	34.5	3.9
Glen-Jackson	34.5	2.5
Thornton-Woodstock 500-Line	34.5	12.2
Thornton-Waterville 505-Line	34.5	10.2
Woodstock-Lincoln 507-Line	34.5	2.0
Chester 537-Line	34.5	1.9
Deerfield D-Line	34.5	1.0
Bamstead 503-Line	34.5	2.9
New Durham-Alton 502-Line	34.5	3.3
Total 115kV:		6.7 miles
Total 34.5 kV:		51.0 miles
<p>* NHEC has not constructed any transmission or sub-transmission lines since 2002, therefore the numbers above have not changed through 2008.</p>		

32. Please provide for the years 2002–2008 the amount expended on vegetation management and the circuit miles trimmed, broken down by transmission voltage class.

For the years 2002 through 2008 for 34.5 kV we expended \$185,000 for 35 miles and for 115kV we expended \$30,000 for 4 miles.

33. Please provide best estimates by percentage of the number of trees or limbs that fell from outside rights of way and contacted electric facilities, causing an outage. Please break down those estimates by area work center and/or town.

Our best estimates for the number of trees or limbs that fell from outside the right of way are as follows:

Alton District -	75%
Raymond District -	90%
Sunapee District -	75%
Plymouth District -	90%
Ossipee District -	50%
Lisbon District	90%
Meredith District	25%
Conway District	25%

34. Please provide best estimates by percentage of the number of trees or limbs that fell within rights of way but beyond vegetation management clearance zones that contacted electric facilities and caused an outage. Please break down by area work center and/or town.

This pertains to limbs that were above wires, within *specifications and above where right of way crews could reach with a 55 foot bucket truck or off road skidder bucket or where we had member and/or scenic road restrictions for minimum reclearing or trimming.

* Specifications - All right of way will be cut existing width or 30 feet and trimmed as required with no overhang.

Sunapee District -	25%
Raymond District -	10%
Plymouth District -	10%
Ossipee District -	10%
Lisbon District -	10%
Alton District -	25%
Meredith District-	75%

35. Please provide by voltage class the number of poles and cross arms broken during the December 2008 ice storm. Please indicate location by area work center, town and circuit number.

Our voltage class would run from 12.5 - 7.2 which would class as 15KV for 90% of our system.

Summary of broken poles & cross arms as follows:

*For detail of this summary, please see attachment - Question 35 - detail

Alton District	14
Meredith District	2
Ossipee District	1
Raymond District	91
Sunapee District	12

Total Broken Poles due to the December 2008 Ice Storm - 120

36. For any transmission or sub-transmission poles broken in the above question, please indicate when the pole was last inspected prior to the December 2008 storm and what, if any, maintenance was performed on it.

NHEC did not have any transmission or sub-transmission poles broken during the storm.

37. Please describe the inter-company communications systems used in field restoration efforts to communicate from field command centers to workers in the field (e.g., voice radio systems, cell phones, etc.). Please differentiate different voice radio systems used.

NHEC uses 3 primary methods of voice communications during restoration efforts:

- 1) IP Phone system/ POTS Lines
- 2) Cell phones
- 3) Voice radio system

Field crews use either voice radio or cell phones to communicate with the command centers.

The NHEC internal IP Phone system is a unified phone system connecting all remote offices together. Remote offices are interconnected via a leased frame relay data network configured in a star topology. The gateways at each remote office are connected to local phone lines only.

NHEC's Private Land Mobile Radio (PLMR) system is a conventional (not trunked), 2-way, voice communications system utilizing 12 RF channels in the 47 & 48MHz band. There are radios in approximately 120 vehicles, 10 District Offices and our Control Center in Plymouth, NH.

Of the 12 channels, one is strictly used for truck to truck communication and may not be monitored by the District Offices and is not monitored by the Control Center. One channel is used by our Billing and Accounts department and is not monitored by either the line crews, District Offices or Control Center. Seven channels are monitored by the Control Center. The remaining three channels are used only for communication between select District Offices. The channel used to communicate between field crew and Control Center is determined by the geographical area the crew is operating in. Approximately 80% of NHEC's service territory is covered by one or more PLMR channels for communication to the Control Center from field crews.

The system is supported by base stations and repeaters located on 12 mountain tops and other remote locations. Channels monitored by the Control Center are done so with the assistance of lease telephone circuits which bring voice and control signals back and forth between the Control Center and these remote locations.

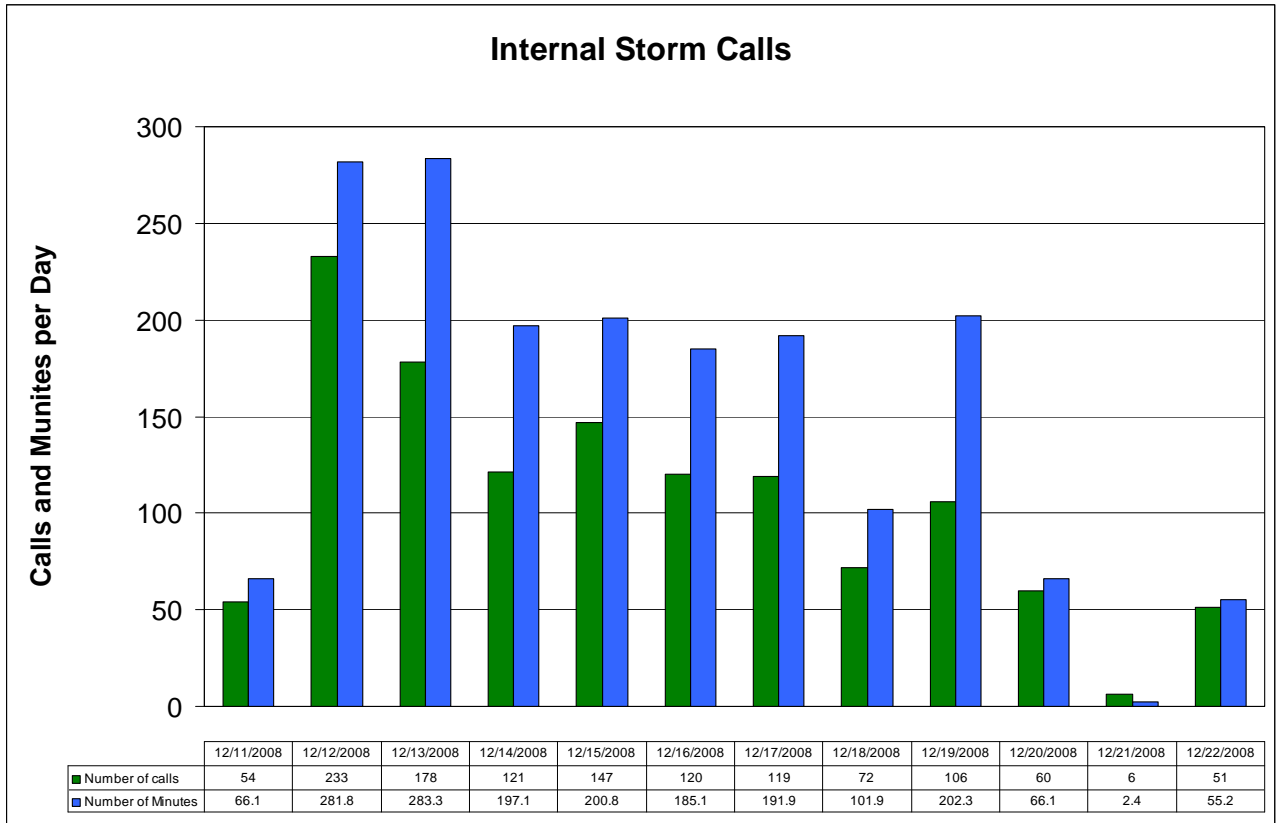
The system is designed to facilitate Line Crews communicating with their home District Office and our corporate Control Center.

38. Please describe the frequency and types of communications methods most used between the field command centers to division/corporated command centers (i.e, telephone conversations, emails, computerized reports, etc.).

Communications between the field command centers and division/corporate command centers is comprised of an:

- 1) Internal VOIP phone system
- 2) Email
- 3) Voice radio system

NHEC uses an internal IP Phone system connected to lease lines for external calling. Internal phone and network systems are connected using frame relay between 9 of the 11 district offices and the Plymouth HQ Complex in a star topology. The eleventh district office (Wolfeboro) is connected via a VPN connection for data only. NHEC uses an Exchange based e-mail system to provide internal and external e-mail communication. The field command center stations do not have e-mail access installed. Graph below shows number of calls and minutes between districts field command centers and division/corporate command centers per day.



NHEC's 2-way radio system uses basic technology and has no statistical measuring abilities. There is no way to determine how many calls were made or received between any parties on our 2-way radio system.

The estimated district communication to the corporate EOC was through: land line - 50%, cell phone - 20%, email - 10% and computerized reports - 20%.

39. Please describe how often conference calls were scheduled within companies (e.g., 3 times daily: at 6am, 2 pm, 8 pm; on an as-needed basis; etc.) and the personnel involved in scheduled calls.

NHEC did not schedule conference calls; communication was accomplished with the storm affected districts 3 times daily or more frequently when needed. Verbal internal updates were provided to Senior Management and the Board or Directors.

40. For those companies using outage management systems please describe any such systems employed in restoration efforts and the perceived benefits of those systems.

NHEC's OMS system is from ABB, with support and custom programming/routines from a company called Siena. The core product from ABB, CadOps, represents the network connectivity logic and graphical mapping tools showing substations, distribution lines, protective devices, transformers, switches and various outage and crew/truck symbols. All reporting features, system summary, and trouble entry features are provided/maintained by Siena.

This OMS system integrates with our Data Collection Information (DCI) Sentry and Interactive Voice Recognition (IVR) systems to improve and expedite outage prediction and restoration efforts. The DCI Sentry system consists of a computer with software that processes calls from strategically field located outage detecting devices when line reclosers open. The IVR system is an interactive voice response system where members place an outage call and receive information about outage status, such as if a crew is assigned, arrived, etc, and also an estimated time of restoration if available; they may request a call back to confirm restoration. Members may also bypass the IVR system and speak to a member service representative if needed.

These systems have been in place and fully operable/integrated since January 2007 and have been used exclusively in the restoration efforts of over 8000 outages. NHEC has 3 OMS workstations in the Plymouth Control Center, plus 10 identical workstations, one at each district office. The Plymouth Control Center is manned 24/7 by five dispatchers on a rotating schedule. They use the OMS system regularly on a daily basis. In addition, there are about 15 other NHEC employees who have been trained to use the OMS, with refresher training approximately 3-times a year. When needed, they are sent to the districts for local dispatching and OMS operations, such was the case during the 2008 Ice Storm. Local operation/dispatching was done at our Sunapee, Raymond, Andover, Ossipee and Meredith Districts.

There are numerous benefits to having an OMS system, especially when integrated with an IVR system, with SCADA, and other systems such as DCI. The OMS core product, CadOps, provides a graphical representation/view of your electrical system, thus the extent of outages and their locations, as well as crew assignments and locations are easily viewed and tracked. The logic, which is embedded into the OMS/CadOps system, expedites outage prediction/restoration, due to the electrical network connectivity, by making more accurate and timely assessments of which devices are open based on active trouble calls received. The ABB OMS is designed to be totally managed/maintained on the computer/workstation, thus eliminated the need for paper outage tickets and reports, although it does have the capability for printing outage tickets, if and when needed. It definitely reduces the amount of paperwork during a big storm. Another important benefit of the OMS/IVR systems is that they work together to provide ongoing outage status, crew assignments, and ETOR (estimated time of restoration) to members when they call in to report an outage. An equally important benefit is the reporting capabilities of the OMS, as provided by the Siena integrated database applications. They can provide extensive real-time and historical outage data and reports, both tabular and graphical, as needed during and after a major storm. Also, this reporting is now made available to many in-house employees, our members, and to the PUC, due to several computer desktop applications and a web-based program.

41. Please describe how many restoration efforts have been completed using the outage management system referenced in Q34 since inception or within the last 3 years, whichever time period is shorter.

The OMS system has been in place and fully operable since January 2007 and has been used exclusively in the restoration efforts of approximately 8,250 outages.

42. Please describe community and public relations efforts employed during the storm, including the number of people employed and the number of communities assigned to local governments.

NHEC had two communications goals during the December 2008 ice storm – to inform the broader public about the progress of the restoration and, when possible, inform members and town officials in communities directly affected by power outages.

A total of eight (8) employees were engaged during the storm restoration in the community/public relations efforts. Two of those five employees were specifically tasked with contacting town managers and other local officials in the communities affected by power outages. These contacts were made daily.

NHEC relied on its website, nhec.coop and statewide media to disseminate information relating to power restoration. Within two days of the storm, NHEC began providing restoration updates three times daily. Those updates were posted on the NHEC website and distributed statewide to New Hampshire media, including Foster's Daily Democrat, Laconia Citizen, Union Leader, Concord Monitor, WMUR, NH Public Radio. Interviews with each outlet were conducted daily. Many of the media outlets posted links on their websites to outage information being posted on the NHEC website. Local shelters were contacted and updated on power restoration efforts.

Complete text of updates included as attachment.

43. Please describe how “downed wire” notifications originating from emergency officials (fire/police/public work departments) are assigned as restoration priorities.

Calls from emergency officials for “downed wires” are received via an unlisted, private direct phone number provided to emergency officials. The Plymouth Control Center forwards this information to the appropriate District Office for action. High priority is placed on calls where information indicates that downed wires are burning/arcng, or presenting a serious safety issue. The District personnel would determine if the “downed wire” was de-energized and/or part of an existing outage for prioritization.

44. Please describe how “downed wire” notifications originating from customers are assigned as restoration priorities, if different from above.

Downed wire notifications from members are a priority when it is suspected that the line could be energized, However should it be known that lines are not energized such as with wide spread outages resulting from a lack of power supply into the area, the field response to the report is done by crew availability to the specific location.

45. Please detail the number of employee safety incidents incurred during restoration with breakdown by in-house, contracting, affiliate or mutual aid companies. Note any incidents that involve electric facilities.

1. NHEC - none
2. Contracting - there was one tree service contractor who injured their lip when a falling limb struck him in the face on December 12th, 2008.
3. Affiliate - none
4. Mutual Aid - none

46. Please detail the number of vehicular incidents incurred during restoration with breakdowns by in-house, contracting, affiliate or mutual aid company employees.

At the beginning of the storm, all vehicles in the NHEC Plymouth Garage were available for use around the system within two hours.

During the storm NHEC employees were able to keep all the line trucks on the job and did not have to bring any in to the garage for repairs.

Repairs

On the line trucks we replaced 2 alternators, 5 batteries, 1 brake canister, 2 tires, and 1 hub. There were also a few electrical repairs to beacons, spotlights and an air hose.

On the smaller support vehicles there was one fuel pump and one lost the rear end. Those 2 vehicles were replaced with pool vehicles (pickups) while they were being repaired so there was no interruption in service.

Repairs made on trucks from assisting utilities were 1 brake canister, air leak and fuel filters. One truck from Vermont had a problem using antifreeze which they nursed until they returned to Vermont. They told us they had thrown a belt before they got here and overheated the engine.

Motor Vehicles Incidents

1. NHEC Pickup Truck - rear end cover was damaged and ring/pinion/bearings were replaced.

Estimated cost of \$1,000.

2. NHEC Pickup Truck- tree limb fell on the body causing damage. We have not seen the pickup yet so the cost has not been determined.

3. A mutual aid vehicle backed into a NHEC Pickup Truck causing damage to front bumper, hood, grill, and braces which were replaced. Estimated cost of \$1,000.

4. While waiting to make a left hand turn into a PSNH staging area a NHEC Bucket Truck was struck on the left front bumper and rear till area by a vehicle traveling in an easterly direction that lost control. PSNH replaced the steering box at their location. The body will need doors replaced. No estimated cost.

5. A NHEC bucket truck was parked at the side of the road completing storm restoration activities when a vehicle approaching from the rear lost control of their vehicle striking the right, rear bumper of the bucket truck. New rear bumper was built in house.

47. For those companies that have affiliates in neighboring states that experienced significant outages at the same time, please explain the process used to assign and deploy resources across state lines for handling simultaneous outages? What processes are in place to ensure NH customers are receiving maximum resources, including crews, management focus, customer relations, and public relations support.

Not applicable to NHEC, we do not have any affiliates.

48. Please identify post-storm activities completed and those still to be completed, with a schedule for completion times (e.g., for ramp down, internal critiques of lessons learned, industry-shared results of lessons learned, debris removal, cleanup efforts, post-event related tree trimming, replacement of any temporary repairs put in place to expedite restoration).

NHEC will have completed all the storm damage line construction by the end of February.

Right of Way work that still needs to be completed has been identified and will be completed once the snow and conditions are favorable to perform the work effort, typically at the end of April or the beginning of May.

Storm critiques have been completed with key personnel and the lessons learned are being communicated throughout the Cooperative. Also new storm restoration improvement initiatives identified are being assigned for further detail workups and will be included in the emergency restoration plan as appropriate.

49. Please provide comparisons of how the December 2008 ice storm compared to the second and third worst outages in your company's history. Include the event name, date, peak number of crews, restoration costs and any breakdowns of those costs, duration of restoration by hours, quantity of customers interrupted, quantity of company customers at the time, percent of customers interrupted, and number of communities affected. This question assumes the December 2008 ice storm is the worst recorded outage experienced. For purposes of determining worst outages assume the deciding factor is the length of time required to restore all customers.

[Please see Attachment Question # 49 Response](#)

50. Please provide any studies the company has undertaken that consider advantages, disadvantages and costs of burying overhead lines with those for underground facilities. Include only those facilities for voltages less than 34.5 kV.

NHEC has conducted cost analysis and cost comparisons between underground distribution and overhead distribution at various voltages that are more project specific ranging from individual member residential single home applications to multi-home developments to center of town applications where a town wants to take their overhead utilities and bury them underground. These are project specific because based on our service territory, and specifically the geography, there is no one general cost that can be reasonably applied to underground service. There is a great abundance of granite and other rock in the ground that can potentially add significant cost to a project and it is not consistent throughout the service territory. Physical geography and terrain and its make up are what drive the higher initial installation cost of underground vs. overhead.

NHEC does in specific applications promote the use of underground applications. The most cost effective underground application is in new construction work. The cost effectiveness of this application works because usually there is major road construction occurring for a development which allows underground utilities to become part of the road excavation project. In residential single home applications where driveways and foundations are being installed, this allows for excavation equipment to be utilized at the site and utilities can run underground within the newly excavated driveway.

It is very difficult to justify removing existing overhead line construction and replacing it with underground as a stand alone project. It is cost prohibitive unless there is significant road and excavation work being performed as part of another infrastructure project; for example there may be a water or sewer project where excavation is going to occur.

There are other areas of line construction that NHEC has addressed with regards to improving reliability of service with overhead electric distribution. In 2005 NHEC completed a comprehensive review and revision of its Construction Standards. As part of the review the standard pole was increased from a 35 foot class 4 to a 40 foot class 3 and the maximum span length was reduced or limited based on the latest NHEC loading requirements. The most significant revision was a change of our "Standard" overhead conductor from bare wire to covered conductor. These measures were done primarily to reduce the impact of storm related events and tree contact on the system. We routinely review the costs of construction for all line extensions and improvements.

Since our goal is to provide the least cost service to our membership while still maintaining a "Best in Class" infrastructure, we typically assess both types of installation, underground and overhead, to determine cost and practicality of installation at the time of design as well as ongoing and future maintenance. Note however, that NHEC has not undertaken any life cycle cost or performance analysis of overhead vs. underground lines, choosing instead to rely on studies published in professional periodicals.