Massachusetts Electric Company
d/b/a
National Grid

Winter Storm 2008 Report

Book 1 of 5

February 23, 2009

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Massachusetts Department of
Public Utilities
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Submitted by:

nationalgrid

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Introduction

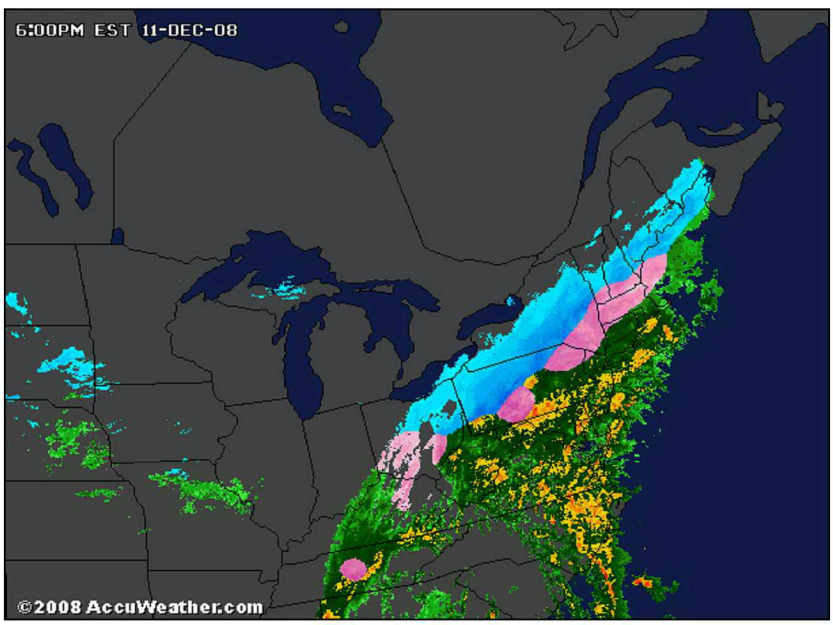
On January 7, 2009, the Massachusetts Department of Public Utilities ("Department") issued an Order opening an investigation into efforts by the state's electric utilities to prepare for, and restore power following, the ice storm that occurred on December 11 and 12, 2008 ("Winter Storm 2008"). The Order directed each electric utility to file, by February 23, 2009, a report responding to a series of questions outlined in the Order.

The following is the report by Massachusetts Electric Company d/b/a National Grid ("National Grid" or "Company"), in response to the Department's Order, relative to Winter Storm 2008 and its impact on National Grid's service territory in Massachusetts. Where applicable, National Grid's responses are divided into separate sections for distribution and transmission.

The Storm

From 4:00 p.m. on Thursday, December 11, until the late morning hours of Friday, December 12, 2008, a devastating storm pounded Massachusetts, New Hampshire, and New York with pouring rain, sleet, and ice, knocking out power to hundreds of thousands and covering the regions in sheets of ice over an inch thick, in some areas. Tree limbs and power lines came crashing down under the weight of the ice. Hardest hit was central Massachusetts northwards into southern New Hampshire, where ice accretions were in excess of one-inch and downed trees and power lines made roads impassable. Figure 1 demonstrates the expansiveness of the storm and its associated impact. The pink shaded area indicates the band of freezing rain.

National Grid - Winter Storm 2008
Figure 1 - AccuWeather Radar Image, December 11, 2008 at 6:00 p.m.



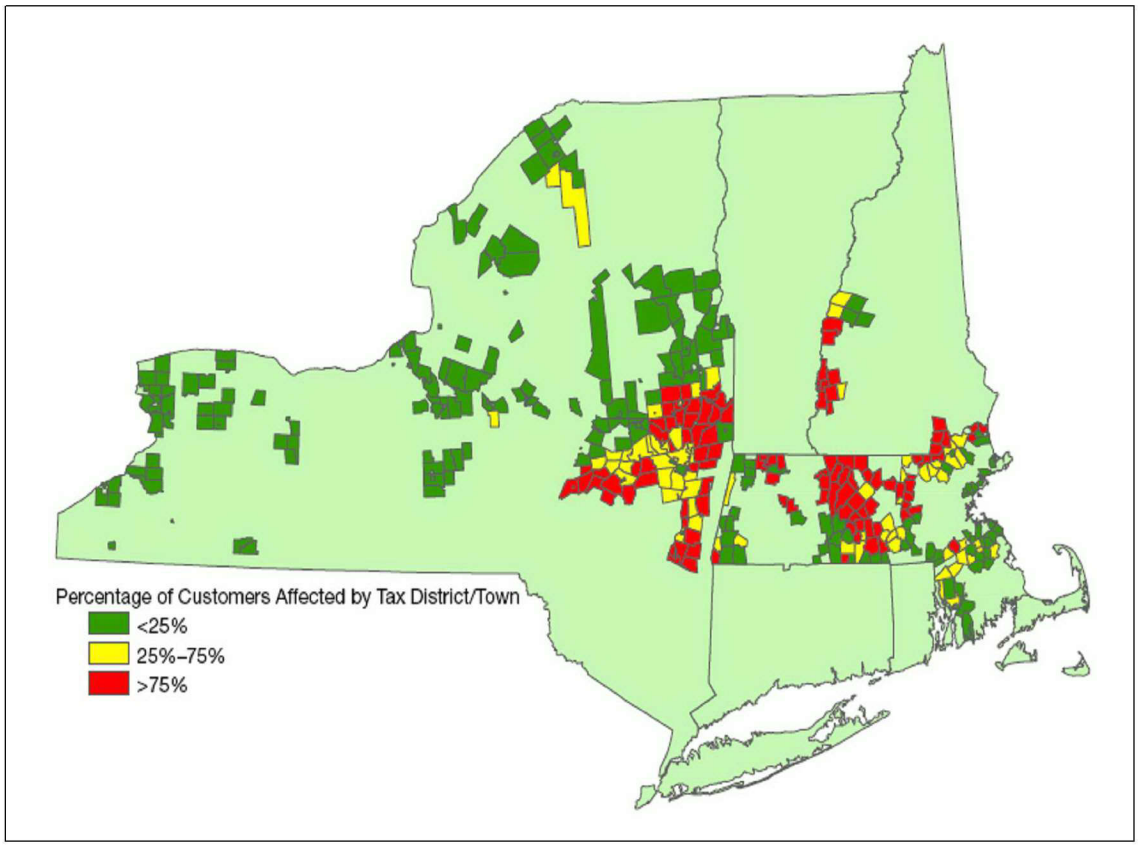
The devastation from the storm was so widespread that Governor Deval Patrick declared a state of emergency on December 11, which allowed him to mobilize 500 members of the National Guard to assist with clearing debris from blocked roads which hampered the efforts of utility crews to reach downed power lines and poles. Areas such as secondary and rural roads remained blocked for days, despite the best efforts of all involved.

In Massachusetts alone, approximately 2,658 square miles of National Grid's service territory was affected by the storm. This included damage to over 500 utility poles, 29 transmission circuits, 124 distribution feeders, 4,530 cross arms, and 360 transformers. When the storm finally ended on December 12, the Company experienced interruptions in 146 of the 169 communities it serves in Massachusetts, with a peak of approximately 294,000 National Grid customers in Massachusetts without power, as a result of the damage caused by the storm.

The photographs below and those included in **Exhibit 1** illustrate the magnitude of the storm's damage and its devastating impact in Massachusetts.

Figure 2 details customer interruptions by locality percentage, and highlights the severe impact of the storm in central Massachusetts.

National Grid - Winter Storm 2008
Figure 2 - Customer Interruptions by Locality Percentage – December 12, 2008



Pre-Storm Activities

The weather forecast on the morning of Wednesday, December 10 predicted that western Massachusetts would likely experience an icing event, with accretions in excess of one-quarter inch. In light of the forecast, National Grid distributed an internal notification email to operations and support organizations, warning about the potential for an ice event, and scheduled a storm conference call for Wednesday afternoon.

A weather briefing, during the conference call, increased the forecasted ice accretion level to over one-half inch across much of western and central Massachusetts. Following the call, National Grid proceeded with storm preparatory actions in accordance with its New England Electric Emergency Procedures, a copy of which is included in **Exhibit 2**. Wednesday evening's weather forecast increased the predicted ice accretions to greater than one inch across central, western, and northern Massachusetts. National Grid continued with the implementation of its pre-storm procedures. The Company scheduled a series of conference

calls for the subsequent days to ensure that all National Grid organizations completed their storm preparations, and were ready to respond to the storm.

The Northeast Mutual Assistance Group ("NEMAG") scheduled a storm conference call early on Thursday, December 11. Based on the forecast at that time, the risk of damage to electric utility infrastructure was believed to be widespread, placing most regional utilities in a position to require outside mutual assistance to help with their anticipated restoration efforts. As a result, National Grid recommended that the list of participants be expanded for the next mutual assistance conference call, to include member utilities from two nearby regional mutual assistance groups, the New York Mutual Assistance Group and the Mid-Atlantic Mutual Assistance Group. These member utilities would later assist National Grid with its storm restoration efforts.

By midday on Thursday, December 11, National Grid's Customer Operations organization issued orders to pre-position crews and storm kits throughout the northern portion of the Company's New England service territory. In addition, National Grid scheduled the Massachusetts divisional storm rooms to open at 12:00 a.m., and the New England Emergency Operations Center to open at 4:00 a.m., on Friday, December 12. The Customer Contact Center in Northborough, Massachusetts increased staffing overnight, in anticipation of the storm's impact, and began to make outreach calls to the Company's life support customers to notify them of the impending storm. National Grid's Materials Management organization verified an appropriate level of inventory and contacted vendors to arrange an uninterrupted supply of stock. National Grid's Fleet Services organization fueled all trucks overnight, so that line crews could begin to restore service, immediately, at daybreak. Media and municipal outreach were initiated in advance of the storm's impact.

Storm Restoration

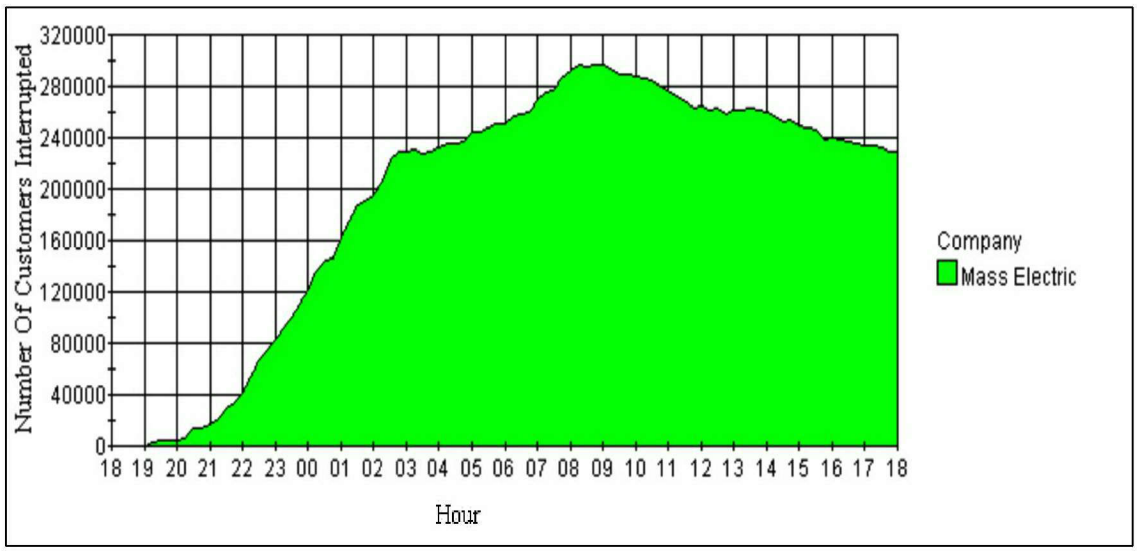
As day broke on Friday, December 12, National Grid's pre-positioned crews set out to restore service. Over the course of the restoration, National Grid committed 95 internal line crews, 255 foreign utility line crews, 585 contractor crews, 28 internal trouble men, and 318 tree crews to work in Massachusetts. While the Company recognizes that even one day without power is difficult for most, the significant damage to utility lines and poles, combined with the widespread debris and blocked roads, which made access to downed equipment difficult, slowed the effort. Further, the weather refused to cooperate. In addition to the continued cold weather that left the ice intact on trees and wires in the days following the storm, Massachusetts experienced gusty winds on December 12, snow and ice on December 17, and even more snow on December 19. The inclement weather made restoration work and travel difficult, and sometimes dangerous.

Even with the severe devastation and inclement weather, National Grid's restoration effort moved at a steady pace, with service returning to customers every hour of every day. By Friday, December 19, National Grid had restored 99% of its customers in Massachusetts, despite having a peak interruption of 293,754 customers as of 8:15 a.m. on Friday, December 12. A summary of the restoration is as follows:

•	Thursday	December 11 at 11:59 p.m.	128,000	pre-peak
•	Friday	December 12	293,754	peak
•	Saturday	December 13	158,636	remaining
•	Sunday	December 14	39,885	remaining
•	Monday	December 15	31,987	remaining
•	Tuesday	December 16	31,661	remaining
•	Wednesday	December 17	15,019	remaining
•	Thursday	December 18	9,633	remaining
•	Friday	December 19	5,039	remaining
•	Friday	December 19 at 6:00 p.m.	1,894	remaining

Figure 3 shows the peak customer interruptions on December 12.

National Grid - Winter Storm 2008
Figure 3 - Customers without Power, Thursday - Friday, December 11-12, 2008
(Massachusetts Electric)



National Grid's response to Winter Storm 2008 demonstrates the effectiveness and flexibility of its emergency planning efforts. The Company's proactive approach in pre-positioning crews and storm kits and taking part in mutual assistance calls in advance of the storm greatly assisted with the restoration effort. Not only did National Grid complete the restoration of its own customers by Saturday, December 20, despite a substantial amount of interruptions, it also provided mutual assistance to other utilities in Massachusetts to help restore their customers. In particular, National Grid provided Fitchburg Gas and Electric Light Company d/b/a Unitil ("Unitil") with more than 146 crews to assist in restoring its customers, some of which had been without power for more than a week.

National Grid is proud of its response to Winter Storm 2008 and especially grateful for the support offered by many customers, municipalities, and government officials during the

restoration. In light of the widespread devastation caused by the storm, a "team" effort by multiple parties was, undoubtedly, the most effective means to restore power. National Grid welcomes the opportunity to review for opportunities to improve upon existing procedures and processes, so that these procedures and processes may work more efficiently during future events.

The following sections contain the responses by National Grid to the specific questions posed by the Department.

1. Restoration Plans and Assessment

a. Provide copy of active storm/emergency restoration plans

National Grid has an established Restoration Plan and Electric Emergency Procedures for the purpose of managing interruptions caused by storms and other natural disasters, civil unrest, major equipment failure, or other emergency events. National Grid's U.S. Transmission Emergency Restoration Plan governs the Company's response to widespread disruptions to the transmission system. The New England Electric Emergency Procedures include details that National Grid adheres to throughout its territory in Massachusetts, New Hampshire, and Rhode Island (collectively "the New England region"), whenever widespread disruptions impact the distribution system. National Grid's New England Electric Emergency Procedures are included in Exhibit 2. National Grid's US Transmission Emergency Restoration Plan is included in **Exhibit 3**.

The Restoration Plan and Electric Emergency Procedures provide the framework for the orderly response of system resources when these events arise. These procedures provide instruction on action taken during major emergencies for (1) the restoration of electric service, (2) the notification of applicable government agencies and the public of emergency restoration progress, and (3) the response to official requests for specific emergency events or actions.

The Restoration Plan and Electric Emergency Procedures are intended to be simple, flexible, and easily adapted to specific emergency events. Whenever possible, the procedures parallel normal operating procedures in order to avoid confusion. This also reduces the need for specialized training or work practices.

The Restoration Plan and Electric Emergency Procedures are updated annually or after they have been used during a large-scale storm event (e.g., Winter Storm 2008), following a storm critique and the implementation of subsequent corrective actions (if any). The most recent update to the New England Electric Emergency Procedures was made in October 2008.

b. Compare activities taken in response to Winter Storm 2008 to the procedures called for in the company's restoration plan

National Grid activated its Transmission Emergency Restoration Plan and New England Electric Emergency Procedures in anticipation of Winter Storm 2008 and immediately in response to the damage incurred. Storm conference calls were initiated two days prior to the storm's impact, to notify all operations and support organizations of the potential threat and to initiate appropriate preparatory actions.

Additionally, the Company's senior executive team initiated the declaration of a "crisis" and assembled the Strategic Response Team. The Strategic Response Team is comprised of senior executives from across National Grid. The Strategic Response Team monitored the Company's response to the storm, at the highest levels.

National Grid's Incident Commander ordered the staffing of the New England Emergency Operations Center as of 4:00 a.m. on December 12. In addition, the Incident Commander ordered the pre-emptive staging of resources, strategically, throughout the regions forecasted to incur the most severe ice accretions. As a result, damage assessment teams were able to mobilize, immediately, on the morning of December 12. These teams inspected the three-phase main line distribution feeders and rapidly communicated the severity of the damage to the storm management team. National Grid's prompt implementation of the damage assessment process allowed it to mobilize significant supplemental resources, very early on in the storm.

National Grid also initiated communication with members of the NEMAG in advance of the storm's impact. Hundreds of outside crews were secured to assist in the restoration effort as a result of a pre-established Edison Electric Institute ("EEI") mutual assistance process with numerous other utility companies.

A number of support organizations within National Grid were mobilized in advance of the storm's impact. These included Materials Management, which verified that appropriate stock was available in the projected impact areas; the Customer Contact Center, which began outbound calls to life support customers to notify them of the impending storm; Government Affairs, which initiated communication with key government stakeholders; Media Affairs, which responded to numerous press and radio inquiries in advance of the storm; and other groups, which assisted in the restoration effort after the storm's passage.

National Grid conducted conference calls with all operations staff and support organizations throughout the storm event. Conference calls were held at 8:00 a.m., 1:00 p.m., and 8:00 p.m. for the duration of the restoration. These calls enabled all groups to remain closely aligned. They also facilitated the prompt deployment of required logistics support and focused complete attention on supporting the restoration effort.

National Grid regularly updated both the Department and the Massachusetts Emergency Management Agency on the status of customer interruptions and crew staffing levels throughout the storm.

Table 1(b), which begins on the following page, details those activities specified in the Electric Emergency Procedures that are needed for the effective and efficient management of interruptions caused by storms and other natural disasters. Winter Storm 2008 was ultimately identified by National Grid as a Level 5 - Major Storm, and managed as such, as per the Electric Emergency Procedures. The following activities represent the initiatives implemented at the tactical level, and are typically defined as operations conducted by the New England Emergency Operations Center in Northborough. Several activities that were not fully implemented are further explained in Section 1.c below.

Table 1(b)

Description	Responsibility	Task Upon Emergency Operations Center ("EOC") Opening	Status
Weather Forecasts	Incident Commander/ Control & Dispatch/EOC Coordinator	Monitor/ communicate the forecast	Fully Implemented
Communication	Tactical and/or System Incident Commander/ Control & Dispatch	Conference call with storm conference call checklist participants	Fully Implemented
Management	Strategic Response Team Chairperson/ System Incident Commander	Regular communication with Strategic Response Team	Fully Implemented
Storm Status Voice Mail (Internal)	Incident Commander/ Control & Dispatch	Update notices	Not Implemented
Daily Bulletins	Incident Commander/ Control & Dispatch	Update/send out e-mail	Fully Implemented
Media Relations	Incident Commander/ Control & Dispatch/ Media Relations/Customer Contact Center	Notify of setup and coordinate messaging	Fully Implemented
Regional Emergency Operations Centers	Incident Commanders	Open and make notifications	Fully Implemented
IS Resources	Incident Commander/ Control & Dispatch/ IS - PowerOn	Make notification to IS and identify facilities requiring support	Fully Implemented

Description	Responsibility	Task Upon Emergency Operations Center ("EOC") Opening	Status
New York Region	Incident Commander/ Regional Control Centers	Make notification to Syracuse storm room and regional control centers	Fully Implemented
Storm Plans	Division and Functional Heads	Follow storm plans	Fully Implemented
Caterers	Meals Coordinators	Make arrangements	Fully Implemented
Hotels	RoD Lodging Coordinators	Make arrangements	Fully Implemented
Staging Sites	Logistics Lead/Logistics Site Managers/Restorati on Managers	Preposition resources and equipment and assess establishing staging sites immediately post storm	Fully Implemented
Work Orders	Division Heads/EOC Coordinator	Issue storm account numbers	Fully Implemented
Credit/ Procurement Cards	Division and Functional Heads/Logistics Site Managers/Lodging Leads	Arrange for credit/procurement distribution and increases, as needed	Partially Implemented
Storm Stock	New England Distribution Center	Deliver storm and yard kits to selected staging areas and drop sites	Fully Implemented
Customer Contact Center	Manager, Customer Contact Center	Implement Customer Contact Center procedures	Fully Implemented
Transportation Fuel/Vehicles	Fleet Services	Obtain vehicles and specialized equipment, as needed.	Fully Implemented

Description	Responsibility	Task Upon Emergency Operations Center ("EOC") Opening	Status
Mobile Phones	Incident Commander/EOC Coordinator	Distribute as needed or requested	Fully Implemented
Staffing Resources	Division and Function Heads	Determine continued resource needs for impacted functions	Partially Implemented
SEAL Resources	Incident Commander/EOC Coordinator/SEAL Coordinators	SEAL Coordinators to keep SEAL database current as to the status of people assigned to the emergency	Partially Implemented
Service Company Personnel	Transmission Line Services	Assign service company personnel, as needed	Fully Implemented
Tree Crews	Forestry/Vegetation management	Put on standby and/or procure additional resources	Fully Implemented
Contractor Crews	Contractor Management	Put on standby and/or procure additional resources	Fully Implemented
Mutual Assistance Foreign Utilities	Contractor Management/EOC Coordinator	Procure additional resources	Fully Implemented
Municipals/LSC/ Critical Facilities	ESS Heads	Notify of opening	Fully Implemented
MEMA RI EMA NH OEM	Security/Regulatory Affairs/EOC Communications Coordinator	Notify of opening and provide frequent updates	Fully Implemented
Training	Division and Function Heads	SEAL and other restoration specific duties (e.g., PORD)	Partially Implemented
Employee Services	Employee Services	Notify of opening	Fully Implemented

Description	Responsibility	Task Upon Emergency Operations Center ("EOC") Opening	Status
Vacation	Incident Commander/ Control & Dispatch	Cancel, as needed	Fully Implemented
Generation (Nantucket)	Incident Commander/ Control & Dispatch	Put on standby	Not Applicable
Special Equipment	Incident Commander/ Fleet Services	Procure and deploy, as needed	Fully Implemented
MA DPU **NH PUC** **RI PUC**	Incident Commander/EOC Communications Coordinator	Notify of opening and provide frequent updates	Fully Implemented

c. Assess performance based on above comparison, identify critical causes and failures, and recommend changes to restoration plans that flow from this analysis

National Grid promptly implemented, and thoroughly executed, its storm restoration plan, in accordance with the requirements of its New England Electric Emergency Procedures. No critical causes or failures occurred during the event. National Grid also conducted a review of its compliance with its Transmission Emergency Restoration Plan and the Company's activities taken to restore transmission assets. National Grid concluded that there were no major inconsistencies with its execution of the New England Electric Emergency Procedures or the Transmission Emergency Restoration Plan. However, the Company made several observations, which could result in improvement opportunities. These observations include:

Distribution

- Storm status voice mail messaging, which is maintained by the Emergency Operations Center coordinator, was not utilized during the restoration effort. This messaging provides an internal number for employees to call in order to monitor the Company's progress regarding customer restoration. The Emergency Operations Center coordinator relied on Internal Communications, via its daily posting on the Company intranet, for this communication. The frequency of intranet postings did not meet the six-hour updates referenced in the Electric Emergency Procedures.

- On occasion, some groups indicated that personnel could be committed to the restoration effort. However, their release was not coordinated through a

common point (e.g., the Emergency Operations Center). As a result, some resources were not utilized as effectively as possible. These were primarily wire down standby and appraisal personnel.

- Training for Electric Distribution Operations and Generation, as well as Storm/Emergency Assignment Listing ("SEAL") personnel, in non-routine storm tasks is conducted throughout the calendar year. However, initial familiarity with some applications (e.g., PowerOn orders and Resources on Demand) was diminished because of the extended time periods between actual uses during a storm restoration effort or storm drill.

Transmission

- Communication and facility issues are summarized together as the inadvertent de-activation of several emergency room phone extensions, which has since been corrected.

- Additionally, communication between the Transmission Emergency Restoration Room and New England Emergency Operations Center was not consistent during the first two days of the event. Corrective measures were implemented on December 14 to improve communications. These measures included the assignment of a Transmission liaison to the New England Emergency Operations Center, as well as the distribution of an electronic report to communicate the repair status of each impacted transmission line. U.S. Transmission will be relocating its Emergency Restoration Room over the next several months to the New England Emergency Operations Center. Enhancements and design requirements have been incorporated to further mitigate facility and communication issues.

2. Determination of Crew Needs and Allocation of Company Crews, Contractor Crews, Mutual Assistance Crews, and Tree Crews

National Grid employed 585 contracted electric distribution overhead line crews, which included over 190 additional diggers with crews, to assist with pole repairs and replacements in the Winter Storm 2008 restoration effort. These contracted line crews consisted of 83 National Grid alliance contractor crews, 80 mutual assistance referred contractor crews, and 425 additional contractor crews from as far away as Michigan, North Carolina, and Nova Scotia, Canada. National Grid aggressively mobilized a very large workforce in a short timeframe.

Construction Delivery, National Grid's contractor line and tree management group, immediately activated its Emergency Storm Roles procedures (a copy of which is included in **Exhibit 4**) to minimize contractor mobilization time and overall restoration time. Construction Delivery worked closely with the New England Emergency Operations Center and the New England – North Division Storm Room with regards to logistics. The successful management of the contracted crews that were attained to support the restoration effort was an enormous task given the numbers of crews involved. All available Construction Delivery personnel were assigned to support the effort, as needed, around-the-clock.

Overall performance of the contracted workforce was outstanding from a production and safety performance standpoint. A small number of non-recordable safety incidents (e.g., cuts and bruises that were limited to first aid treatment) were reported throughout the storm's duration. National Grid's ability to hire contractors for distribution line work was enhanced by the fact that the Company does business, regularly, with large national and local contractors. Some of these vendors also perform work for other utilities. With proper releases, they can provide emergency services to quickly move resources from one part of the country to the other, if needed to assist in storm events.

a. Provide copies and/or descriptions of mutual assistance agreements

The following mutual assistance agreements are included:

- EEI Mutual Assistance Agreement (**Exhibit 5**)
- EEI "Suggested Governing Principles Covering Emergency Assistance Arrangements Between Edison Electric Institute Member Companies" (**Exhibit 6**)
- EEI Mutual Assistance Agreement Signing Companies as of October 30, 2007 (**Exhibit 7**)
- NEMAG Charter (**Exhibit 8**)

- NEMAG Procedure (**Exhibit 9**)

b. Describe procedure for obtaining mutual aid crews

Distribution Crews

Mutual assistance is typically rendered once the storm is over and the impacted companies have completed their own damage assessment. This approach allows the supporting utilities to divide, equitably, the available resources based on the needs of the requesting companies. Mutual assistance comes in two forms: (1) contractor crews that work for specific utilities; and (2) employees of other utilities. As part of the request process, utilities request specific types of resources, such as digging crews, additional supervision, damage assessors, and other resources, to assist with the storm restoration effort.

National Grid is a member of EEI's "Restore Power" website. This website is dedicated to facilitating electrical utility restoration needs before, during, and after emergencies caused by natural disasters. The online Restore Power community provides an accurate, real-time source of information that allows requesting utilities to find crews, contractors, and vendors in a timely manner. A copy of the EEI Mutual Assistance Agreement is included in Exhibit 5.

National Grid is a signatory to EEI's "Suggested Governing Principles Covering Emergency Assistance Arrangements Between Edison Electric Institute Member Companies." (*See* Exhibit 6). This document streamlines the process by which mutual assistance is requested, rendered, managed, and reimbursed between signatory companies. It is also the base document by which one or both EEI members, who are not signatories, may enter into mutual assistance agreements.

Additionally, National Grid is a member of the NEMAG. The NEMAG is a collection of electric utilities in the United States and Canada, which have gathered together for the planning and implementation of a timely, efficient, and cost-effective restoration effort of their impacted transmission and distribution systems, which is in the interests of the members and their customers. The NEMAG Charter is included in Exhibit 8, and the NEMAG Procedure can be found in Exhibit 9. National Grid was instrumental in establishing the NEMAG in June 2007.

The major objectives of the NEMAG are detailed below:

- To provide an enhanced line of communication between members before, during, and after major storm planning, restoration, and invoicing activities;

- To plan (proactively) for the rendering of mutual assistance between members, as the weather situation and resource needs dictate;

- To share resources, where applicable and permitted, separate of a major storm, enhancing the service and quality of storm/emergency planning between and for members; and

- To document the proactive means by which members respond to a major storm via common guidelines and procedures.

During Winter Storm 2008, National Grid coordinated resource requests with EEI's Restore Power community and the NEMAG, as well as other regional mutual assistance groups, to achieve its resource needs for providing timely restoration of its customers.

Distribution Line Contractor Crews

On Thursday, December 11, Construction Delivery pre-positioned some of the Company's New England alliance contracted workforce to division-identified service centers in support of the anticipated restoration. In addition, the Incident Commander requested that Construction Delivery procure additional resources from the Company's established emergency contractor list. These resources had existing emergency contracts in place with National Grid and were rapidly mobilized.

After National Grid's emergency contractor list was exhausted, Construction Delivery, with the support of Procurement Services, the Company's vendor and material management group, successfully reached out to additional resources from other regions in the United States and Canada. Emergency contracts were placed, as needed, and resources were mobilized quickly.

As mentioned, National Grid's ability to hire contractors for distribution line work was enhanced by the fact that the Company does business, regularly, with large national and local contractors. Some of these vendors also perform work for other utilities, outside of the region. With the approval of their home utility company, these contractors can mobilize large numbers of supplemental crews, and, on a priority basis, quickly move resources from one part of the country to the other, if needed to assist in storm events.

Distribution Forestry Crews

Similar to contractor line crews, National Grid's ability to hire contractors for tree work was enhanced by the fact that the Company does business, regularly, with large national and local contractors. The Company works with large tree vendors that also perform work for other utilities and specialize in tree trimming and removal services. These vendors provide emergency services with the approval of their home utility companies, and have the ability to quickly move resources from one part of the country to the other, if needed to assist in storm events.

Transmission Crews

All mutual assistance requests are made through and processed by the New England Emergency Operations Center in Northborough, Massachusetts. Requests for supplemental transmission crews were made early on in the restoration event. The New England Emergency Operations Center identified two transmission-qualified crews from among the mutual assistance crews secured by National Grid for use in New York and re-directed them to assist in the restoration of the transmission system in Massachusetts.

c. Provide time line of calls to engage mutual aid crews

National Grid was aggressive in engaging the assistance of mutual assistance crews in response to Winter Storm 2008. Prior to the storm, National Grid made mutual assistance calls to three different regional mutual assistance groups: NEMAG, New York Mutual Assistance Group, and Mid-Atlantic Mutual Assistance. In addition, National Grid took advantage of EEI's "Restore Power" website, which as mentioned, contains a national repository of utilities willing to provide mutual assistance support to other utilities during emergencies. (*See* Exhibits 5-7).

The first mutual assistance call was requested by a NEMAG member on Wednesday, December 10, and scheduled for 8:30 a.m. on the following day, December 11. National Grid, along with other NEMAG member utilities, participated in the call. The December 11 call revealed that all New England utilities anticipated that the forecasted storm would impact their service territories. It also revealed that the forecasted ice accretion amounts had increased to in excess of one inch in some areas.

As a result of this call, National Grid requested a larger call group to include not only NEMAG, but both the New York Mutual Assistance Group and Mid-Atlantic Mutual Assistance Group member utilities. This call was scheduled for 6:00 a.m. on Friday, December 12. During this call, reported damage from NEMAG members varied greatly. National Grid reported approximately 250,000 customer interruptions in its New England service territory, while a neighboring utility estimated approximately 290,000 customer interruptions. The remaining utilities responded with estimates ranging from only a few thousand interruptions, to tens of thousands of customer interruptions. Participants on the call anticipated that these estimates would increase as the storm lingered. As a result, National Grid continued to request resources from mutual assistance utilities.

A representative from Baltimore Gas & Electric, a Mid-Atlantic Mutual Assistance Group member, agreed to coordinate the pooling of resources for NEMAG. During a scheduled 12:00 p.m. call on December 12, National Grid reported a peak of over 500,000 customer interruptions in its U.S. footprint, with over 293,000 in Massachusetts.

Some of the mutual assistance resources National Grid acquired for its New England region via this call included:

- American Electric Power (Ohio)
- Dominion (Virginia)
- Consumers Energy (Ohio)
- Northern Indiana Public Service Company (Indiana)
- NStar (Massachusetts)
- Pepco Holdings, Inc. (Delaware/Maryland)
- Vectren Corporation (Indiana)

National Grid also received assistance from line contractors located in Indiana, Michigan, North Carolina, Ohio, Pennsylvania, Tennessee, and Virginia. **Exhibit 10** is a table that depicts the external crew compliments assigned to Massachusetts.

Although no further NEMAG calls were held once the available resources were assigned, the impacted utilities remained in contact with one another as their respective restoration efforts progressed. With this on-going communication, National Grid requested additional resources from the Mid-Atlantic Mutual Assistance Group on Sunday, December 14. Baltimore Gas & Electric (Maryland) and Public Service Enterprise Group (New Jersey) responded to the mutual assistance request with a number of internal line crews.

Table 2(c)-1 depicts the mutual assistance requests made by National Grid for Winter Storm 2008.

Table 2(c)-1

Utility Name	Date/Time Contacted
AEP (Ohio)	12/12/2008 13:00
Allegheny Power	12/12/2008 13:00
Baltimore Gas & Electric	12/12/2008 13:00
	12/13/2008 10:00
	12/14/2008 11:30
Bangor-Hydro	12/12/2008 13:00
Central Maine Power	12/12/2008 13:00
Central Vermont Public Svc	12/12/2008 13:00
Consolidated Edison	12/12/2008 13:00
	12/13/2008 10:30
Consolidated Edison - Orange & Rockland	12/12/2008 13:00

Utility Name	Date/Time Contacted
	12/14/2008 11:30
Dayton Power & Light	12/12/2008 13:00
	12/13/2008 10:00
	12/14/2008 11:30
Detroit Edison	12/12/2008 14:00
Dominion	12/12/2008 13:00
Duke Energy (Ohio)	12/12/2008 13:00
	12/13/2008 12:00
Duquesne Light	12/12/2008 13:00
	12/13/2008 11:30
	12/14/2008 12:00
First Energy (Pennsylvania)	12/12/2008 13:00
	12/14/2008 12:30
Green Mountain Power	12/12/2008 13:00
Hydro One	12/12/2008 13:00
	12/13/2008 10:15
	12/14/2008 11:45
	12/15/2008 9:00
Hydro-Quebec	12/12/2008 13:00
	12/14/2008 12:00
New Brunswick Power	12/12/2008 13:00
	12/13/2008 11:00
Northern Indian Public Service Company (NIPSCo)	12/12/2008 13:00
Northeast Utilities	12/12/2008 13:00
Nova Scotia Power	12/12/2008 13:00
	12/13/2008 14:00
NStar	12/12/2008 13:00
	12/13/2008 13:00
	12/14/2008 15:00
PECO Energy	12/12/2008 13:00
PHI - Connectiv	12/12/2008 13:00
PHI - PEPCO	12/12/2008 13:00
	12/14/2008 12:00

Utility Name	Date/Time Contacted
PPL	12/12/2008 13:00
	12/14/2008 11:30
PSEG	12/12/2008 13:00
	12/13/2008 13:00
	12/14/2008 12:30
UGI	12/12/2008 13:00
	12/14/2008 11:00
United Illuminating	12/12/2008 13:00
Unitil Energy	12/12/2008 13:00
Vectren Energy	12/12/2008 13:00

Massachusetts Mutual Assistance Provided by National Grid

During the course of the storm, the New England Emergency Operations Center was in communication with its contact at the Massachusetts Emergency Management Agency, providing information and monitoring the status of other utilities' restoration efforts. Once its own restoration efforts were substantially complete, National Grid was in a position to support other Massachusetts utilities that had outstanding resource requests.

This effort began on Friday, December 19 and continued through Monday, December 21, as crews were released. In addition to releasing the resources listed in Table 2(c)-2 below, National Grid led an effort to support the Massachusetts subsidiary of Unitil, by providing that company with an additional 65 line crews (with an eventual total of 146 internal and external line crews) later on December 22. This number joined the 81 contractor line crews, 25 tree crews, 3 to 7 man transmission crew, and additional support personnel from National Grid who were deployed on December 20 and 21. This effort began on Saturday, December 20 and lasted through December 25.

Table 2(c)-2 details the contractor line crews that National Grid released to other Massachusetts utilities on December 19 and 20.

Table 2(c)-2

Utility Name	Contractor Name	Total Crews Released
Unitil	Midwest Power	17 line + 17 diggers
	Energy Group	14 line
	Carr & Diff	8 line

Unitil via National Grid	Harlan	19 line
	Hawkeye	16 line + 1 Digger
	Thiro	10 line
	McDonough	7 line
	Grattan	2 line
Princeton Municipal	MJ Electric	8 line
NStar	Hawkeye	11 line

The majority of transmission contractor crews were working on company-assigned transmission projects at the time of the storm event.

d. Describe how decisions for crew allocation were made

As described in Section 2.c. of this report, a representative from Baltimore Gas & Electric agreed to coordinate the pooling of resources for NEMAG. The mid-Atlantic region received little or no adverse impact from the storm and was in a position to offer a significant quantity of crews. During the call, National Grid suggested that the mutual assistance requests made by the smaller utilities should be rendered first, with National Grid and Northeast Utilities dividing up the remaining crews. The utilities all agreed to this proposal and implemented the approach during the call.

Most of the transmission crews utilized during the restoration process had been working on construction and maintenance projects on National Grid property prior to the impact of the ice storm. The allocation of mutual assistance transmission resources was initially discussed during the first NEMAG conference call; however, the member utilities did not require any mutual assistance transmission crews.

e. Discuss whether there were delays in crew availability/arrivals

Several utilities in the northeast United States and eastern Canadian provinces that were contacted on December 12 and 13 were unable to render mutual assistance due to trouble with their own systems as a result of the storm's passage. However, utilities from other regional mutual assistance groups, which made commitments to National Grid, were able to render assistance without any notable delays.

There were no delays in transmission crew availability or arrivals for Winter Storm 2008.

f. Provide crew assignments by date, location of work, and description of work performed

Exhibit 11 shows National Grid distribution crew assignments by platform, date, and location. The line crews assigned to these areas worked in the municipalities covered

by that platform during normal operations. **Exhibit 12** depicts crew coverage by area. Due to the severe damage reported in portions of central Massachusetts north of Worcester, the restoration effort was decentralized to the substation level in these areas. In these instances, the substation became the work platform with its main line feeders the focus of restoration activities.

During the first days of the storm, distribution line crews worked to restore main line sections of circuits, as well as respond to any public safety concerns. As restoration progressed, crews completed main line circuit restoration before moving on to side tap repairs and service repairs. Side taps with minimal damage were restored in concert with the main line, where possible. In general, due to the nature of the storm, crews were assigned to a region and remained in that region.

The work performed by distribution line crews consisted of pole replacement, pole top hardware replacement, and splicing and/or restringing of wire. Service restoration work consisted of reattachment of service drops to homes and/or replacement of the service wire. Service restoration work was performed by line crews, as well as qualified service repair crews from other departments within National Grid (e.g., Substation Operations and Maintenance Services, and Gas Operations from Long Island).

In addition, Gas Distribution (i.e., Customer Meter Services and Gas Operations) personnel were used for wire down appraisal and standby personnel. Gas Distribution released service representatives from Long Island to assist in these activities in Massachusetts. Gas Distribution crews began individual service restoration and repair on December 14, and continued through the completion of the overall restoration effort. The use of "across line of business" employees exemplifies National Grid's effective utilization of qualified employees to assist in responding to an emergency.

Tree crews worked ahead of the line crews, removing fallen trees, clearing limbs from the lines, and clearing roads so the line crews could readily access the damaged locations and perform necessary repairs

Transmission crews were assigned by the Transmission Emergency Room located in Westborough. Assignments were based on the prioritization of repairs required to the transmission system. **Exhibit 13** identifies the assignment of National Grid crews to each transmission repair, throughout the restoration event.

After the restoration of the transmission system, transmission line crews were re-deployed to assist in the restoration of the distribution system, focusing on numerous sub-transmission lines throughout Massachusetts, as well as several rear-property distribution feeders in Worcester.

3. Damage Assessment

a. List all available damage assessment personnel

Table 3(a) details the number of distribution damage assessor and wire down personnel that were assigned to the Massachusetts restoration effort between December 12 and 19. The two groups worked in conjunction with one another via the wire down coordinator. As the damage assessor reported public safety issues to the coordinator, a wire down person was assigned to safeguard the hazard until a line crew made the area safe.

Table 3(a)

	Dec 12	Dec 13	Dec 14	Dec 15	Dec 16	Dec 17	Dec 18	Dec 19
Damage Assessor	60	104	128	160	74	69	76	76
Wire Down	112	303	422	584	494	493	336	332

Exhibit 13 identifies the damage assessments that were conducted for the transmission system. These included numerous transmission rights-of-way foot patrols, as well as helicopter patrols. Many helicopter patrols were repeated, throughout and following the restoration event, to ensure that new damage did not occur after having restored transmission lines to service.

b. Describe timing of damage assessment and provide all supporting documentation

Damage assessment of the distribution system included a public safety phase where available resources were initially focused on wires down, so as to de-energize any unsafe conditions. Damage assessment began in the early morning hours of Friday, December 12, with supervisors and on-duty line workers.

Upon daylight on the morning of December 12, damage assessment teams were operational and were assigned to perform a Phase 1 main line assessment of the circuits that had locked out as a result of the ice damage. Phase 1 surveys (within the first 24 hours) are a rapid assessment of the three-phase main lines on the impacted feeders.

Beginning on the morning of December 13, damage assessment then progressed to Phase 2, which included the entire circuit. Phase 2 surveys (within 48-72 hours) are detailed surveys of the entire impacted infrastructure.

A copy of National Grid's Damage Assessment Procedure is included in **Exhibit 14**. Please note that, since the prior annual plan filing, the Damage Assessment Procedure

used in Massachusetts has been revised. Exhibit 14 is the revised Damage Assessment Procedure, which was implemented during Winter Storm 2008.

Transmission damage assessment coordinators mobilized transmission damage assessment teams on the morning of December 12. Foot patrol inspections to assess damage began on the morning of December 12. Helicopter patrols commenced later on Friday, December 12, when visibility and conditions became suitable for flying. The assessment of transmission damage assessment survey data was performed jointly between the Transmission Emergency Room and Transmission Dispatch, to align the restoration priorities.

Exhibit 13 provides additional details on transmission damage assessments that were conducted during Winter Storm 2008.

c. Describe procedure and timing for translating damage assessment into crew orders

During Phase I, distribution damage assessors are provided a geographic one-line of the circuit to use as a switching diagram, together with damage assessment forms and envelopes. The assessors mark the observed damage on the one-line map, capture the details of the damage on a damage assessment form, and return the map and forms to the damage assessment coordinator, at the end of the day. Due to reduced visibility and added risk to safety, damage surveys are not typically conducted during overnight periods.

During night operations, the damage assessment procedure describes the packaging of damage assessment forms, by substation and circuit, along with circuit prints and location maps. This data is logged and the packages are delivered to the substation lead (if fully de-centralized) or the local storm room for assignment to crews.

Similarly, in Phase 2, damage assessors are furnished with a set of complete circuit prints as well as damage assessment forms and envelopes. Damage assessors turn their packages in each night. During night operations, work packages are prepared by substation and circuit. These work packages are delivered to the substation leads (if de-centralized) and division storm rooms for the assignment of crews.

Damage assessment continues until all impacted circuits are completely surveyed.

d. Describe specific damage reported by customers during Winter Storm 2008

The impact of Winter Storm 2008 created widespread damage in urban and rural sections of National Grid's service territory. The damage included National Grid-owned assets as well as infrastructure damage to the municipalities where the Company operates. This included broken street lights and public safety signs, uprooted trees, and buildings and vehicles damaged by fallen limbs and trees. Commercial and residential customers experienced property damage that included structural damage to buildings

and homes, as well as commercial and personal vehicle damage from fallen trees and limbs.

National Grid's PowerOn Outage Management System ("PowerOn"), a General Electric application for tracking and interpreting outages, allows for customers to report instances of damage to the electric system. There are several specific categories of conditions (e.g., no lights) and damage (e.g., wire down) that can be entered in PowerOn. Customers can report certain combinations of conditions and damage, for example, a report of "no lights" along with "wire down," together with certain multiple instances of damage. National Grid uses the damage reports from customers as additional information toward enabling an effective Company response. The damage reports, however, are logged as reported by customers, and are not validated or verified in PowerOn at the time of entry or corrected at any point during the Company response.

As detailed in Table 3(d), from 12:00 a.m. on Thursday, December 11 to 12:00 a.m. on Saturday, December 20, National Grid logged the following reports of damage from Massachusetts customers into PowerOn:

Table 3(d)

Damage Category	No. of Reports
Wire Down	6,763
Wire and/or Tree Condition	3,723
Pole Condition	789
Other Damage (e.g., Loud Noise)	640

e. Describe specific damage to company equipment and other property during Winter Storm 2008

National Grid sustained extensive damage to its distribution system, which was discovered through reports from field work crews and supervisors, the damage assessment process, and reports from customers and municipal and public safety officials. The damage to National Grid's distribution system included: primary and secondary conductors; wood and metal pole top hardware; overhead switching devices (both manual and automatic); pole-mounted transformers; pole guy support wires and anchors; street light brackets; and wood poles.

Wood poles of various size and age were broken at the ground line and also at various attachment points above ground. In many cases, anchor and guy wire assemblies failed under the weight of the ice, causing poles to lean over. Wire of various sizes, including #6, #4, 1/0, 336.4, 4/0, and 477 aluminum and copper, broke or were damaged by trees. Automatic and manual feeder sectionalizing equipment was damaged when the poles they were mounted on broke due to fallen trees.

Damage in rural areas also included pole structure and line damage in distribution rights-of-way that run through wooded areas. In urban areas, it also included damage to distribution lines that were built and maintained in the backyards of customers in the City of Worcester. Table 3(e)-1 details the damage impacts and the approximate number of incidents or impacted units.

Table 3(e)-1

Damage Impact	No. of Incidents/ Impacted Units
Transmission circuits locked-out	29
Distribution feeders locked-out	124
Damage incidents requiring attention	>4,000
Feet of distribution wire replaced	803,000
Poles broken	538
Cross arms broken	4,530
Transformers damaged	360

Table 3(e)-2 details the transmission circuits in Massachusetts that experienced interruptions due to the storm. The mode of damage associated with the circuit is also included, in some cases.

Table 3(e)-2

Circuit ID	Circuit Name	Circuit Voltage (kV)	Damage Observed
337	Tewksbury - Sandy Pond	345	T/R in ice storm. Helicopter patrol did not find any cause.
343	Sandy Pond - Wachusett	345	Static wire down 2nd Str out of Sandy Pond. Cut clear.
A1	Vernon - Pratt's Junction	69	Multiple trees on lines, downed conductors and broken static wires on different sections. Broken insulator Str 85.
A127	Harriman - Webster St	115	Multiple trees on line Str 470-472
A53	Wachusett - Cooks Pond	69	Trees on line in multiple locations, Str 173 & 186 leaning, Str 170 & 136 broken insulators, Str 80 & 81 broken poles.

Circuit ID	Circuit Name	Circuit Voltage (kV)	Damage Observed
B128	Harriman - Millbury 2	115	Multiple trees on the line and wires down Str 81-84.
B2	Vernon - Pratt's Junction	69	Multiple trees on lines, downed conductors and broken static wires on different sections.
B54	Wachusett - Cooks Pond	69	Tree on line Str 40
D4	Vernon - Deerfield 4	69	Tree down Str 202
E205E	Bear Swamp Upper Yard - Pratt's Junction	230	Two trees were on the line, Str 1053-1054, Str 904-905. Conductor not damaged.
E5	Ware 1- Meadow St	69	Patrol did not find cause.
F6	Ware - Meadow St	69	Nothing found on patrol.
G33	Bellow Falls - Ferry	69	Multiple trees on line, Str 166 & 171. Conductors and guys broken.
H160	Hudson-Northborough	115	Trees on the line Str 41 Bigelow St.
I135S	Flagg Pond - Pratt's Junction	115	No damage found by Helicopter patrol.
J10	Deerfield 5 - Adams	69	Static wire down Str 32-36; Conductor down Str 34-35.
L164	North Dracut - South Broadway	115	Helicopter patrol did not find any cause.
M39	Fitch Rd - Wachusett	69	Broken insulator, Str 10.
N166	Hudson - Northborough Rd	115	Multiple trees on line.
N40	Pratt's Junction - Fitch Rd	69	Str 10 leaning.
O215	North Litchfield - Tewksbury	230	T/R Helicopter patrol found no damage.
O42	James River Paper - Ayer	69	TLS found broken pole, Str 3
U21S	Fort Devens - Pratt's Junction	69	Multiple trees on the line. FI 6.2 mi from Pratt's Jct
V174	Millbury 2 - Carpenter Hill	115	Tree on line between Str 382-383.
V22S	Prospect St. - Pratt's Junction	69	Tree on line Str 8 near Litchfield St.
W23	Fitch Rd - Woodside	69	Multiple trees on the line.

Circuit ID	Circuit Name	Circuit Voltage (kV)	Damage Observed
W23W	Woodside - Northborough Rd	69	Multiple trees on the line
Y151	Hudson - Tewksbury	115	Trees down at 2 locations near High Plain Rd.
Y25N	Bennington - Harriman	69	Tree on line Str 163.

4. Describe Interruption Tracking and Field Dispatch Coordination

Electric service interruptions and trouble calls at National Grid are managed and tracked using the PowerOn Outage Management System. PowerOn functionality includes a database in which all recorded reports of service interruption and other trouble conditions can be logged, analyzed, prioritized, dispatched to repair crews, tracked to resolution, and archived for subsequent investigations. In simple terms, the PowerOn system models the electric distribution physical network, such that individual interruption reports are automatically associated and analyzed (predicted) to the most probable interruptible device.

A core feature of PowerOn enables interruption and trouble orders to be dispatched and assigned to repair personnel within the application. Interruption areas and crew locations are displayed graphically to assist with efficient resource assignment and coordination. As additional information becomes available and field work is completed, PowerOn is updated with the pertinent details (such as interruption duration, weather conditions, interruption cause, damaged/repaired equipment, and other details, as applicable) that enable stakeholder reporting and subsequent interruption analysis.

5. Prioritization of Interruption Repairs

a. Provide list of priority treatment groups (e.g., fire, medical, police, water, sewer)

Please refer to National Grid Electric Emergency Procedure .100.30, § 3.3 Restoration Sequence (a copy of which is included in **Exhibit 15**). This section contains National Grid's list of priority treatment groups.

b. Describe procedure for addressing medical needs/critical customers registration and notification

National Grid allows customers to self-identify the usage of life-sustaining equipment on their premises, and has adopted specific procedures for tracking and communicating with these customers. National Grid uses the terminology "life support customer" as a general description to identify these types of customers.

Once National Grid determines the possibility that life-sustaining equipment may be in use at a customer's location, the Company requests that certain additional information be added to the customer's account to identify the nature of the equipment, as well as additional third-party contact information. National Grid mails a "Notice of Life-Sustaining Equipment" form (**Exhibit 16**) to customers to identify life-sustaining equipment information.

For customers that are not yet identified as life support, National Grid sends bill inserts twice a year requesting that customers contact the Company if they are dependent on life-sustaining equipment and wish to add the life support designation to their account. When a customer does so, National Grid sends them the "Notice of Life-Sustaining Equipment" form. Existing life support customers are automatically mailed a renewal letter during the spring of each year, requesting that they verify/update their life support status. Upon receiving such information from customers, National Grid updates its account records so that the life support priority designation is prominently displayed whenever the account is accessed.

The life support designation is used in a few different ways. In PowerOn, service interruptions involving life support customers are visibly displayed in order to allow restoration efforts to consider the nature of these customers while prioritizing restoration efforts. In addition, all life support customers are contacted by National Grid in advance of anticipated major events in order to allow these customers to make additional preparations for the possibility of their electric service being interrupted.

In anticipation of widespread service interruptions following Winter Storm 2008, the Company implemented the process where the list of life support customers was extracted from the customer accounts database. This information was then directed to the Global Connect (third-party software) application, which telephoned each life support customer with a pre-recorded message advising of the potential for service interruption due to the forthcoming storm.

c. Explain how remaining customers were prioritized

Distribution

Many factors are involved when determining the prioritization of distribution-related interruption repairs and implementing the repair/restoration effort. Relevant considerations include factors such as:

- 911 emergency reports
- Critical customers
- Electrical system considerations (i.e., electric supply restoration must precede customer restoration)
- Numbers of customers

Extreme emergency circumstances receive the highest priority. Examples include downed live wires, equipment fires, and other extreme hazards posing a significant risk to the public. These "911-type" of reports can be individually identified and dispatched via PowerOn, with a priority code that reflects the urgency of the situation.

Additionally, National Grid has adopted several procedures and guidelines concerning the prioritization of critical customers, groups of customers, and circuits (feeders) connecting customers to the electric network. This prioritization is a factor in determining where restoration efforts are focused. However, specific physical conditions, resource capabilities, and particular circumstances may dictate the actual restoration sequence.

In general terms, certain critical customers are assigned a code corresponding to the type of facility best describing their purpose. **Exhibit 17** lists the codes applied to critical facilities. For example, hospitals are identified with the code "HOS" and are typically the highest priority tier of critical facility. The next tier of high priority critical facilities include major airports (code = AV1), evacuation centers (code EVA), and others, as listed in Exhibit 17. The next tier of medium priority critical customers is also coded as per Exhibit 17. The next tier of priority corresponds to the number (in 100's) of customers on the feeder. The final factor is the number of medical priority customers on the feeder.

Many distributions feeders are "weighted" according to the relative priorities of the individual critical customers served by the feeder. This feeder weight is used to determine a relative numeric ranking of high priority feeders in a particular operating area. The feeder weight is an eight digit number that reflects the sum total of all coded critical customers on that feeder.

An example of a (theoretical) feeder weight would be: 1 hospital (1) + 3 high priority critical facilities (3) + 9 medium priority critical facilities (09) + 3,810 customers (38) + 6 medical priority customers (06). Therefore, feeder weight = 13093806.

The principal use for distribution feeder weights is to identify high priority feeders that should be excluded from the emergency manual load shed plan; however, these feeder rankings are also used to help prioritize restoration efforts around feeders supplying critical customers. In addition, National Grid has not weighted all feeders, because most feeders supply some critical facilities and restoration priority would follow other criteria, such as number of customers interrupted.

Transmission

Another major determinant from an electric system perspective is that the electricity supply must be restored before load (customers) can be restored. Since the electricity supply (in very general terms) originating at the generating stations is delivered via transmission lines to substations, distribution feeders, and then to customers, for service restoration to be possible, the up-stream components must be available or restored first. With a large-scale restoration effort it is possible to perform repair work, concurrently, at many locations; for example, transmission line repairs may be underway while distribution repairs are occurring. However, actual restoration of service at the distribution feeder level is contingent upon the supply for these feeders being available.

As a general principle, notwithstanding 911-type emergencies, critical customers without service, supply unavailability, physical constraints, and other considerations, the intent is restore service to the greatest number of customers in the shortest time possible.

National Grid's Transmission Control Center and the Independent System Operator-New England ("ISO-NE") operate the transmission system in accordance with the following procedures:

- ISO New England Operating Procedures No. 19, Transmission Operations (**Exhibit 18**)[1] and National Grid New England Control Center/REMVEC II Operating Procedure: 19, Transmission Operations (**Exhibit 19**).
- ISO New England Master/Local Control Center Procedure No. 2, Abnormal Conditions Alert (**Exhibit 20**).
- ISO New England Operating Procedures No. 12, Voltage and Reactive Control (**Exhibit 21**) and National Grid New England Control Center/REMVEC II Operating Procedure: 12, Voltage and Reactive Control (**Exhibit 22**).

ISO-NE, an agency independent of the power generators and electric utilities, is responsible for the constant availability of electricity across most of New England. ISO-NE meets this obligation in three ways: by ensuring the day-to-day reliable operation of New England's bulk power generation and transmission system (to include abnormal conditions like storm restorations), by overseeing and ensuring the fair

[1] Please note that Appendix D to Exhibit 18 is not included because it contains critical energy infrastructure information. National Grid can provide Appendix D to the Department, upon request, on a confidential basis.

administration of the region's wholesale electricity markets, and by managing comprehensive, regional planning processes.

In conjunction with ISO-NE, National Grid's Transmission Control Center operates the Company's transmission system so that the most severe single contingency can be sustained without causing:

- Equipment damage due to thermal overload;
- Cascading thermal overloads;
- Excessively high or low voltage or voltage collapse;
- Unit or area instability; or
- Un-damped oscillations.

In addition, any single contingency should not cause the loss of other critical facilities or portions of the bulk power system.

Transmission system operators use the Energy Management System to assess current system conditions and potential contingencies that could impact system security and reliability. Those interruptions that impact the reliability of the bulk power system are given the highest priority for repairs, as determined by the Transmission Control Center and ISO-NE.

During Winter Storm 2008, two bulk transmission circuits experienced sustained interruptions, and two bulk transmission circuits tripped and reclosed. A bulk circuit is identified as electric supply at or over 345 kV. The Transmission Control Center made the above outlined assessments for these operations and determined that the reliability of National Grid's bulk power system was not adversely impacted. The Transmission Line Services Department worked closely with the distribution companies to prioritize restoration of customer load.

6. Call Center Operations During Storms

a. Provide detailed information on calls from customers calling in to report interruptions, including number of calls received by date, by location, and by type of complaint

At peak, the New England Customer Contact Center in Northborough, Massachusetts had approximately 165 representatives taking incoming calls. During the storm, the Customer Contact Center shifted to handling power interruption/emergency calls only. Table 6(a) notes the customer call volume National Grid representatives handled during each day of Winter Storm 2008.

Table 6(a)

Date	Calls Offered	Calls Abandoned	Total Calls Answered	% Calls Answered
12/11/2008	14,177	1,449	12,728	89.8%
12/12/2008	42,867	9,212	33,655	78.5%
12/13/2008	17,080	277	16,803	98.4%
12/14/2008	15,059	227	14,832	98.5%
12/15/2008	24,626	331	24,295	98.7%
12/16/2008	22,520	148	22,372	99.3%
12/17/2008	19,524	253	19,271	98.7%
12/18/2008	17,061	218	16,843	98.7%
12/19/2008	12,722	107	12,615	99.2%
Totals	**185,636**	**12,222**	**173,414**	**93.4%**

Of the 173,414 calls answered, approximately 94% were both initial and repeat interruption calls. Approximately 4% were wire down reports and 2% were for reports of tree damage.

Despite the long hours worked during the storm, employee morale and dedication was consistently elevated, stemming from the constant communication between groups and support services offered to the employees by the Company throughout the restoration event. The Customer Contact Center received a significant amount of support from all Departments trying to help provide customers answers wherever they could.

Overall, most customers were patient and understanding given the magnitude of damage during this event. Customer service representatives were able to satisfy most customers' inquires, directly, and few customers asked to escalate their concern to supervisors or others in management. National Grid has received numerous "thank

you" letters and e-mails from customers for the line and tree crews, as well as the customer representatives managing the calls.

b. Provide copy of written instructions and/or protocols to call center support personnel (i.e., information on extent of damage, estimation of response time)

Exhibit 23 contains information that was provided to the Customer Contact Center representatives to assist customers during the storm.

Examples of Messages Provided to Representatives:

- Information pertaining to restoration efforts
- Number of customers affected in each area
- Safety reminders to relay to callers
- City/town municipal inspector requirements
- Emergency shelter contact numbers
- Consistent communication related to mandatory twelve hour shifts and hardships representatives may be experiencing
- Available supplies for representatives
- Breakfast, lunch, and dinner schedule

During major storm events, National Grid has established storm roles and responsibilities to assist with coordinating various elements of critical support. An individual was assigned to the storm communications coordinator role to align/coordinate communication to call center representatives, media relations, and the inter-voice response upfront messaging system.

Storm Communications Coordinator Call Center

- Created and distributed internal communications for the Center.
- Updated emergency-related information on the Storm Central website.
- Coordinated communications with Media Relations.

Coordination with Media Relations allowed for consistent messaging on the inter-voice response unit, which is the technology that allows customers to hear upfront messages and self-service. This enabled National Grid to provide customers with the most accurate information as it related to estimated times of restoration, safety, mutual assistance, and any regional information that might assist them.

c. Describe provisions for receiving and responding to the volume of customer calls

December 10, 2008

Immediately following the cross-functional pre-storm call, the following steps were taken by the Customer Contact Center manager:

- A department meeting was held with management personnel related to expected weather conditions and potential staffing requirements.
- Staffing plan and storm assignments were reviewed.
- SEAL was reviewed.

December 11, 2008

- Additional staff on site (from Thursday, December 11 through Friday, December 12).
- This included 25 Customer Contact Center representatives and six management personnel.

December 12, 2008 6:00 a.m. – Activated Storm Roles and Responsibilities

In addition to the storm communications coordinator described above, the following storm roles and responsibilities were activated to address staffing and staffing support:

- **Staffing Coordinator for Contact Center**
  - Established and created twelve hour shifts for representatives and management.
  - Activated SEAL position and established schedules.
  - Coordinated meal availability and lodging with the lodging coordinator.
  - Notified representatives of their shift assignment during the storm.

- **Food and Lodging Coordinator for the Contact Center**
  - Checked availability of rooms in advance.
  - Maintained and updated a list of hotels and number of rooms available.
  - Checked availability of meals, services, and amenities.

- **Storm Room Coordinator for the Contact Center**
  - Checked availability of computer, telephone, and telephone-related equipment.
  - Maintained a copy of SEAL positions.
  - Coordinated training required to perform functions, if needed.

- **Ultimate Incremental Staffing Complement**
  - Twenty Contact Center representatives
  - Six management personnel
  - Contact Center representatives were required to report for mandatory twelve hour shifts.
  - Twenty-five SEALs were contacted to report to Northborough for mandatory twelve hour shifts.
  - An additional 140 incoming ports were added for incoming telephone traffic to eliminate busy signals for customers.

- An outside contracted contact center site was added to help in the effort of answering incoming calls.

7. Describe Communications, Written and Oral, with Municipal Officials and Agencies, Prior to and During the Storm, and Provide Supporting Documentation

Prior to the Storm:

Communications with State and Local Public Officials

The Energy Solutions Services group of National Grid has the responsibility for communicating with local and state public officials during storms. The key to effectively handling an emergency situation is to establish a communications protocol that is flexible enough to adapt to situations that require special attention. During Winter Storm 2008, Energy Solutions Services was able to accomplish this by implementing the following steps prior to and during the storm:

- Hosting annual emergency preparedness meetings with local officials;
- Notifying officials that the Municipal Room phone line had been activated;
- Hosting conference calls for local officials;
- Face-to-face visits between National Grid personnel and local officials;
- Conducting conference calls to address specific problems; and
- Proactive outreach to communities on a daily basis.

As a standard practice system wide, Energy Solutions Services, across the Company, including the New England – North Division, (i.e., Western, Central, Merrimack Valley, and North Shore), host annual meetings with local fire, police, civil defense directors, and other public officials. During these meetings, National Grid's communication plan is reviewed and emergency response numbers provided. Emphasis is placed on establishing an expedited means for communicating with public officials via the municipal phone lines, along with wire down and Customer Contact Center numbers. There is always adequate time allowed for those attending to ask questions and offer suggestions for improvement.

During the Storm:

Notify Officials that the Municipal Room Phone Line has been Activated

On the morning of Friday, December 12, at 6:00 a.m., the Municipal Rooms in North Andover and Worcester were activated and ready to accept calls. Figure 4 on the following page displays the different divisions/districts in Massachusetts. Activating the municipal phone lines is a two step process:

- First, National Grid faxes a letter to police, fire, and other public officials to notify them that the Municipal Room has been opened. The letter provides the direct phone number and the "wire down" number.

- Second, National Grid follows up the fax with a phone call to each community asking if they received the faxed information and understand that the municipal phone line has been activated. Energy Solutions Services staffs the Municipal Room throughout the duration of the storm.

National Grid - Winter Storm 2008
Figure 4 –Division/Districts in Massachusetts

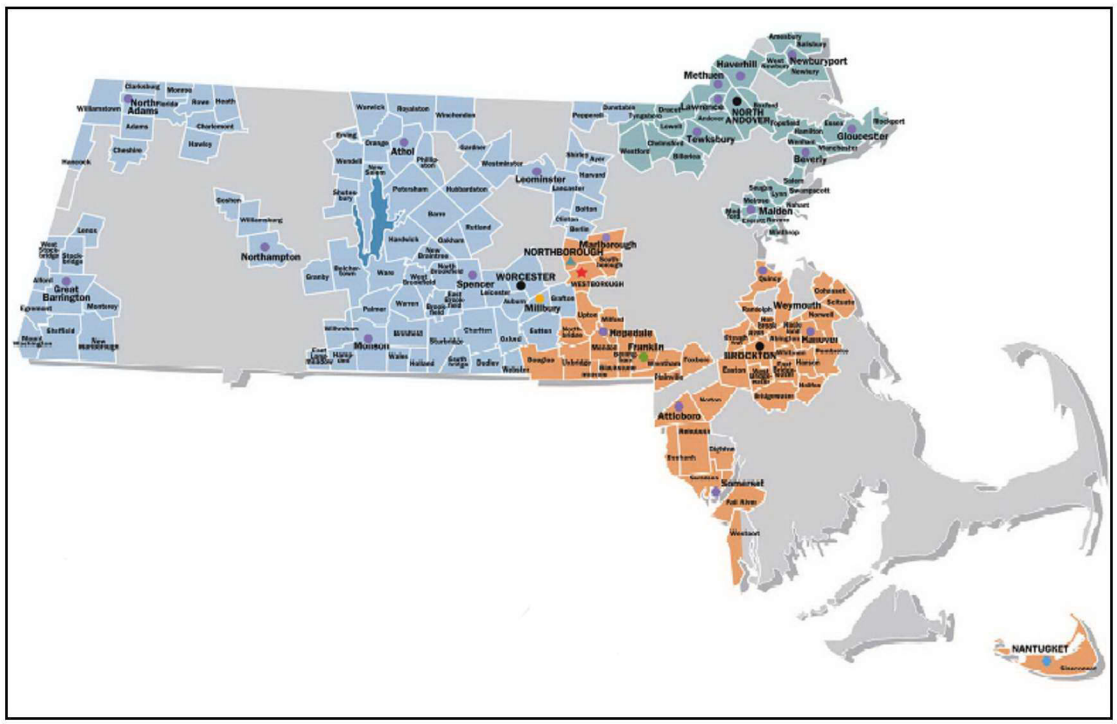


Exhibit 24 is a sample letter that was faxed to public officials alerting them that the Merrimack Valley Municipal Room was opened. **Exhibit 25** is the list of municipal officials who were contacted concerning the opening of the Merrimack Valley Municipal Room. Both Exhibit 24 and 25 are included for sample purposes; they do not cover all areas.

At the end of the storm the procedure was repeated with a faxed letter notifying the officials that National Grid was closing the Municipal Room phone lines. The faxed message was followed up with a phone call to each community. In North Andover, the Municipal Room was closed on Friday, December 19 and in Worcester, the Municipal Room was closed on Monday, December 22.

Host Conference Calls with Public Officials

The idea of hosting conference calls with public officials was introduced during the annual system wide storm drill in July 2008, and was implemented for the first time in Massachusetts during Winter Storm 2008. The conference calls were conducted by the

local Energy Solutions Services Director and the Vice President of Electric Distribution Operations on a daily basis throughout the storm. The calls included a high level overview of available resources, identified the problem areas, and provided an estimate as to when power would be restored. Specific questions were discouraged because of the large number of people participating in the call. People were encouraged to call the Municipal Room with any specific requests. Overall, the conference calls were well-received by public officials. The Worcester Municipal Room conducted seven conference calls, and the North Andover Municipal Room conducted five.

Exhibit 26 is the list of public officials invited to participate in the conference calls in the Merrimack Valley. It is included, again, for sample purposes.

Face-to-Face Visits between Company Personnel and Local Officials

On the third day of the restoration effort, Energy Solutions Services implemented face-to-face visits with communities that had large numbers of customers without power. At this point in the restoration process, National Grid had an accurate assessment of the damage in local areas from reports submitted by the damage assessors. An account executive from Energy Solutions Services visited with local officials to convey the following information:

- Explanation of how power is restored to an area;
    - Transmission lines
    - Substations
    - Mainline feeders
    - Side taps
    - House services (use of door hanger cards to notify homeowners that they need an electrician)
- Assessment of damage in the community;
- Explanation of why they may not have seen anyone working in their community; and
    - Substation feeders may emanate from another community where crews are working
    - Mainline distribution feeder work may be on-going in an adjacent area
- Workforce availability and estimated time of restoration

Face-to-face visits were conducted in the Merrimack Valley communities of Amesbury, Haverhill, Chelmsford, Lowell, Dracut, Tewksbury, and Westford. In the Central and Western Districts, National Grid visited Worcester, Gardener, Rutland, Westminster, and Leicester.

National Grid deployed its Mobile Emergency Operations Center in communities that had significant numbers of customers without power. The Mobile Emergency Operations Center is a commercial bus outfitted with voice and data systems equipment for satellite, digital, and analog communications. The unit provides a safe,

recognizable, and comfortable place for customers to inquire about the status of the local restoration process. The Mobile Emergency Operations Center was located at various times in Gardner, Hubbardston, Rutland, and Westminster.

Many National Grid customers visited the Mobile Emergency Operations Center during the restoration. This vehicle is deployed at the discretion of the Division Storm Director in conjunction with the Incident Commander. Typically, the Mobile Emergency Operations Center is deployed to municipalities that are impacted, significantly, by a storm, to serve as a platform for the Company to address local concerns and/or oversee the restoration effort in that area.

Conduct Follow Up Conference Calls to Address Specific Problems

There were times when National Grid needed to provide additional, specific information to a community, so the community could make local decisions concerning its citizens. These conference calls involved internal resources (e.g., field supervisors, directors, and managers) who could better address the issues in question. For example, the Town of Westford requested a meeting to address restoration issues in its town. Several representatives from the town participated in the call, including the Superintendent of Schools, Chairman of the Board of Selectmen, police and fire chiefs, the Department of Public Works Director, and Town Manager. A similar conference call was held in the City of Worcester, concerning delays in restoring power due to the inaccessibility of overhead lines in some neighborhoods. These focused, community-specific conference calls worked well and were appreciated by local officials.

Proactive Outreach to Communities on a Daily Basis

Throughout the entire restoration process, Energy Solutions Services personnel that staffed the Municipal Rooms made outbound calls on a daily basis regarding the following topics:

- The municipal line was still open;
- If the community had any specific issues or questions, to let the Company know;
- There were specific telephone numbers for customer service, wires down, and the Municipal Rooms; and
- Review of the number of customers without power in their community.

The officials had access, via the National Grid website, to the number of customers in their communities without power. Although the estimated restoration times were not detailed in the first several days, customer interruptions were reported. Often times the customer data would fluctuate as various areas of the community were restored. This fluctuation in numbers often required an explanation, especially when the numbers increased due to the new loss of a distribution line or section. The follow up calls were a means of keeping local officials informed of the restoration effort.

Company communication with public officials was essential. During the storm, National Grid proactively engaged the communities and provided updates as to the restoration process and progress. Regardless of the information contained in the updates (i.e., positive or negative), National Grid understood that public officials needed the updates to make educated decisions for their communities.

Transmission

Transmission Commercial Services contacted municipal electric departments in the communities most affected by the ice storm. Specifically, extensive communication took place between National Grid and the municipalities of Templeton, Paxton, Hudson, Ashburnham, and Princeton. This communication was in addition to regular operational communication channels, which remained available during the restoration effort.

Discussions with the Town of Templeton centered on energizing the 69 kV A1/B2 line on Saturday evening, December 13. Contact with the Town of Princeton continued into Tuesday, December 16, and included updates about progress on reconstruction of the 609W2 feeder out of the Ashburnham substation. Contact with the municipalities of Ashburnham, Paxton, and Hudson indicated no operational or communication issues.

Contacts with State and Federal Officials

Both National Grid's Regulatory Affairs and Government Affairs organizations were involved in ongoing communications with state officials during the storm. Beginning on Sunday, December 14 and continuing through the restoration effort, the periodic "National Grid – Massachusetts Status Update," issued by the New England Emergency Operations Center, was sent via e-mail to the Attorney General's office to keep it abreast of the Company's restoration efforts.

Also, on Monday, December 15, an e-mail was sent by Government Affairs to the State House legislative offices of the representatives and senators from the impacted communities, providing an update on restoration efforts and encouraging those legislative offices receiving calls from their constituents with outage reports or questions about restoration, to direct all calls to the Customer Contact Center. An additional e-mail communication was sent to the same offices on Thursday, December 18, providing another update on the restoration effort and, again, encouraging constituents to call the Customer Contact Center to report any remaining outages or to inquire about restoration timelines.

Please note that impacted Massachusetts senate and congressional delegations were kept informed of restoration efforts by Government Affairs via periodic e-mail alerts and phone calls throughout the restoration effort.

8. Describe Communications with Customers During Interruptions

In addition to the inter-voice recognition upfront messaging and direct communications with customers by Customer Contact Center representatives (previously discussed in Section 6), Media Relations provided extensive information to media outlets, and the Customer Contact Center initiated several, proactive outbound calls to customers.

Proactive Outbound Calls and Contact with Life Support/All Customers

While a specific listing of life support-only customers does exist, National Grid made the decision to contact not only life support customers, but all customers affected by power outages. On Friday, December 12, National Grid attempted to notify affected customers that the restoration efforts would last several days. Customers were also advised to seek emergency shelter and to treat all downed wires as live and dangerous. This call was executed using the Global Connect broadcast messaging system. For customers with functioning answering machines, National Grid left messages. Customers without phone service, however, were not able to receive a call.

Additional proactive calls were made when customer operations determined that feeders were restored. National Grid attempted to contact customers on a feeder-by-feeder basis to advise them that power was restored in their area and that, if they still did not have power, to "hit 9" to speak to a live representative to report their interruption or to call the Company. All proactive broadcast messages were conducted using Global Connect.

All non-emergency meter work was postponed. Customers with scheduled orders were notified via a Global Connect out-bound call that all crews were working on the storm emergency and that their order needed to be rescheduled. Customers were asked to call back at a later time to reschedule their order.

Inter-voice Recognition Upfront Messaging

Area specific messages were added and updated throughout the day to advise callers of pertinent information related to their city or town. Upfront messages for customers calling in to the Customer Contact Center included Massachusetts State of Emergency information, awareness of local interruptions, safety reminders to stay clear of fallen wires, generator safety, and the number of crews assisting in the restoration effort for each area. As the restoration efforts progressed, and estimated restoration days/time became available, that information was added to the upfront messaging as well.

Exhibit 27 is the communication to the Customer Contact Center regarding mutual assistance, safety, and storm information. (*See also* Exhibit 23). This information was sent to the representatives and put on the inter-voice recognition upfront messaging.

Website

The Massachusetts specific pages on the National Grid website were updated with visuals from the restoration effort and press releases describing restoration progress. In addition, in Massachusetts, Storm Central was available on the National Grid website with interruption information by locality. Storm Central is a series of pages where customers can report their interruption online, obtain estimated times of restoration, view the number of customer interruptions by city and town, and read important storm preparedness information.

Media Relations

During Winter Storm 2008, Media Relations' primary goal was to provide information to media and customers that was timely, consistent, and accurate. Primary messages throughout the duration of the storm focused on safety, the magnitude of the damage, the magnitude of the restoration effort, and once available, estimated restoration dates and times. The Media Relations team took part in all system wide storm conference calls, participated in selected municipal conference calls, and participated in the Company's Strategic Response Team to assure all messages and information were accurate and consistent.

Media Relations followed standard practices as outlined in department and corporate emergency plans throughout the storm. The group deployed appropriate resources to Northborough and served as an integral part of the New England Emergency Operations Center. As needed on both a proactive and reactive basis, Media Relations deployed to field locations in Massachusetts where media had interest in shadowing working crews, illustrating the damage, covering the Company's Mobile Emergency Operations Center, and covering the Company's donation to the American Red Cross, which is further detailed in the Conclusion Section of the report.

Media Relations staff began fielding media calls on Thursday afternoon, December 11, before the storm hit, and ramped up the group's response as the event grew in size. The team responded to hundreds of media inquiries from newspaper, radio, and television outlets in the affected areas during the duration of the storm, and several more from media outlets outside of New England. The storm and its impact also garnered national and international media interest.

Throughout the storm, Media Relations participated in live radio and television interviews around the clock, providing radio updates and live updates during morning, noon, evening, and nightly television newscasts. At least one informational news release was issued per day to all New England area media outlets. (**Exhibit 28** contains copies of sample distributed news releases). Proactive calls were also made to targeted media to deliver important messages that needed to reach customers as the storm restoration progressed, including safety messages regarding avoiding downed wires,

proper generator installation, and avoiding carbon monoxide poisoning through proper ventilation and home-heating measures.

In addition to providing information through media calls and news releases, Media Relations provided updates on its New England media hotline three to four times a day. Targeted message dissemination times coincided with broadcast media schedules: 6 a.m., 11 a.m., 4 p.m. and 9 p.m. (**Exhibit 29** contains copies of sample media scripts). Within these messages, listeners were reminded that real-time information on interruptions in Massachusetts was readily available on the Company's website as part of the Storm Central pages.

Some highlights of Media Relations' activities and resulting media coverage for Winter Storm 2008 include:

- Media Relations in New England responded to more than 250 media calls on a 24/7 basis.
- Media Relations wrote scripts and updated its media hot-line voice mail on average four times a day, producing approximately 25 scripts.
- Nine press releases were written and distributed during the storm.
- Media Relations participated in more than 30 storm conference, Strategic Response Team, and municipal calls.
- Proactive safety messages issued.
- Proactive warning of scam involving opportunists posing as National Grid and asking customers to pay for restoration services.
- Media invited to tour Northborough staging area and interview Company executive on restoration process.
- Proactive use and media notification of the Mobile Emergency Operations Center in areas hardest hit by the storm.
- Proactive American Red Cross donation and associated media notification.

Media Coverage Highlights

- December 12 and 13 – live telephone interviews on Boston television, damage assessments, restoration, and preparedness.
- December 11 through 17 – provided information to wire services, including AP Boston.
- December 12 – American Red Cross donation, check presentation made at Gardner shelter; Lieutenant Governor's tour; media coverage of National Grid's gift.
- December 13 – proactive outreach to all major broadcast media and major print media; safety messages (including, but not limited to – WBZ radio and TV, WHDH TV, WCVB TV, NECN, Fox 25 TV, Boston Globe, and Worcester Telegram and Gazette).
- December 13 and 14 – Boston Herald, Boston Sunday Herald restoration, shelter coverage.

- December 13 – Springfield Republican restoration coverage.
- December 14 – WHDH TV – damage and restoration in Worcester area.
- December 15 and 16 – Proactive appeal to all broadcast and print media to warn customers of scam to charge for restoration. All major Boston radio/TV/print media covered.
- December 15 and 16 – Mobile Emergency Operations Center in Gardner and Hubbardston covered by media.
- December 15 and 16 – WBZ TV – Worcester's Burncoat section restoration.
- December 17 – Proactive outreach of Northborough staging area; coverage by WHDH TV, NECN, and Fox 25.
- December 17 – Boston Globe articles on damage assessment crews' work; separate article on utility preparedness.
- December 17 – WGBH's Greater Boston interview.
- Significant online (website) coverage of the storm and restoration from December 11 through 18 of all major Massachusetts media outlets.

Exhibit 30 contains a sampling of actual news coverage of Winter Storm 2008.

Advertising Response to Winter Storm 2008

National Grid developed and placed two ads as part of its storm communications plan to convey important messages to customers.

- **Safety Ad** – published December 15 and 16 – highlighted a restoration update; focused on warning customers to avoid downed wires; called attention to generator safety.

- **Thank You Ad** – published December 21 and 22 – acknowledged service interruptions and inconvenience; thanked customers for their patience; thanked all who helped during the storm; included American Red Cross donation message.

Samples of both ads can be found in **Exhibit 31**. In addition, please see **Exhibit 32**, which includes a chart, summarizing: media outlets/placements; publication circulation; and placement timing.

9. Provide Vegetation Management Procedures, and Trimming Activities for Transmission and Distribution Lines, by Circuit and Town, Including Maintenance Schedules, for the Last Five Years

Distribution Vegetation Management Program

National Grid's vegetation management program consists of a reliability-based strategy of cycle pruning and enhanced hazard tree mitigation. The reliability-based program began in 2003 with a conversion from town-based trimming to feeder-based trimming. During this conversion, each circuit was scheduled into a cycle-based approach, with full conversion nearing completion at the end of 2009. The cycle-based approach includes an optimal cycle length set for each area based on growing season, growth characteristics of predominant tree species in that area, and clearance to be created by pruning. (*See* **Exhibit 33**, which is a copy of National Grid's Distribution Vegetation Management Strategies). For Massachusetts, the cycle length is five years.

As cycle length was formulated, National Grid established goals for the number of miles of overhead distribution line to be pruned each year to reach the five year cycle, and scheduled feeders that provided the best reliability return for the expense first. For a full five year history for Massachusetts, please refer to **Exhibit 34**, which details the distribution vegetation maintenance schedule in Massachusetts for the last five years. In addition, National Grid has modified its pruning specifications to include the removal of dead, dying, or structurally weakened limbs from above the primary wires, as well as adding a storm prevention provision, which includes shortening all overhanging pine species boughs beyond the overhead clearance limit to reduce the likelihood of long pine boughs loaded with ice or wet snow from drooping down or breaking onto the conductors. (*See* **Exhibit 35**, which is a copy of National Grid's New England Distribution Line Clearance Specifications).

National Grid also targets the removal of "hazard trees" as additional interruption prevention measures. Hazard trees are those capable of falling onto overhead primary wires from above or alongside the right-of-way and potentially causing tree-related interruptions. While pruning provides a measure of public safety, improves access for National Grid's crews, and has some reliability benefit, the removal of hazard trees and hazardous conditions over the primary wires has the direct effect of minimizing future tree-related interruptions. For this reason, National Grid instituted the enhanced hazard tree mitigation program in 2006. This program is an extensive, tree and limb removal program, performed in addition to the cycle pruning program. It is intended to minimize the frequency and damaging affect of tree and limb failures. This program is applied to select circuits primarily based on reliability performance, and may also be done while a circuit is undergoing cycle pruning. It focuses on the removal of hazard trees and dead, dying, or structurally weakened overhead branches. For the history of the enhanced hazard tree mitigation program, please refer to Exhibit 34.

National Grid's vegetation management vendors are required to follow its distribution pruning specification and are closely monitored for compliance with these requirements. Each vendor is currently under contract with National Grid to provide the pruning services for a given area. National Grid moved to competitive bidding in 2005, which places the requirement for productivity on the vendors and allows the Company's arborist to focus on the pruning specifications and quality of work. To ensure compliance with specifications and quality, National Grid's arborists complete a full audit of all work completed. (*See* Exhibit 35).

In addition, National Grid's standard for distribution construction typically calls for "spacer cable" and "tree wire" to be installed in treed areas. Such construction is inherently more "tree resistant" when compared with traditional bare wire – cross arm construction configuration, thereby complimenting the Company's vegetation management efforts.

Transmission Vegetation Management Program

The primary objective of National Grid's Transmission Vegetation Management Program is to minimize interruptions due to vegetation. Other objectives of the program include providing a clear and safe work space and access for maintenance activities.

National Grid's strategic approach to vegetation management within the right-of-way is to establish and maintain rights-of-way that are largely clear of all incompatible vegetation while maintaining a stable low-growing plant community that is pleasing to the eye and beneficial to wildlife. National Grid's strategic approach to manage vegetation adjacent to the right-of-way is to prune and/or remove danger trees and/or hazard trees where property rights allow vegetation management work.

Rights-of-way that are largely clear of incompatible vegetation present a very low risk of vegetation-caused interruptions. Vegetation adjacent to right-of-ways (danger and hazard trees) presents a greater risk of interruptions. The risk from danger trees and hazard trees is related to the following variables: the distance from conductor to the adjacent tree line; conductor distance above the ground; height of trees; tree species; and tree health and condition. National Grid seeks to mitigate risk of interruptions from trees adjacent to the right-of-way through site specific management of these variables.

Vegetation management work on transmission and distribution rights-of-way is organized into two programs:

- **Right-of-Way Floor Program** – management of vegetation within the right-of-way corridor; and

- **Off Right-of-Way Danger Tree Program** – management of vegetation adjacent to the right-of-way corridor.

To achieve its vegetation management objectives, National Grid utilizes an Integrated Vegetation Management program, which emphasizes selective herbicide use to control incompatible vegetation. The Integrated Vegetation Management program integrates the use of various methods of herbicide applications and non-herbicide mechanical vegetation management methods, and is used on both the right-of-way floor and the adjacent utility forest. The Integrated Vegetation Management program includes the use of herbicide (supplied as basal stump and foliar applications), hand cutting, mowing, selective mowing, and selective pruning methods.

Transmission Forestry is responsible for system-wide design, planning, coordination, and supervision of all right-of-way vegetation management operations. This includes, but is not limited to, preparing and implementing a Vegetation Management Program, scheduling work, estimating budgets, prescribing herbicides and application methods for each right-of-way, obtaining necessary permits, preparing required notifications, selecting contractors, spot checking treatment crews, and providing technical expertise and liaison between National Grid and landowners, local and state officials, or other interested parties. Transmission Forestry also provides local oversight, coordination, and enforcement of vegetation management policy, procedures, and the Vegetation Management Program on National Grid's transmission rights-of-way.

For more details on National Grid's Transmission Vegetation Management Program, please see the Massachusetts Five Year Right-of-Way Vegetation Management Plan (2004–2008) (**Exhibit 36**), the Transmission Forestry 2008 Right-of-Way Yearly Operational Plan (**Exhibit 37**), and National Grid Transmission Forestry Right-of-Way Vegetation Management Specification 2008-2009 (**Exhibit 38**).

a. Right-of-Way Floor Program

National Grid's right-of-way floor program is a treatment operation, which generally includes most of the vegetation management methods described herein. Employing herbicides and treatment methods consistent with the sensitivity of the site is the preferred method of vegetation management. Four methods of herbicide treatments are utilized: basal application; cut stump application; and low-volume and high-volume foliar applications.

Treatment is generally carried out in two phases: preparatory treatment and foliar treatment. These two phases may be carried out separately or simultaneously, depending on vegetative conditions or permit requirements for each right-of-way segment.

National Grid transmission foresters identify right-of-way segments to be treated each year in the annual work plan. Field inventories of each right-of-way segment to be

treated are completed by Company transmission foresters and provided to the contractor.

An Integrated Vegetation Management treatment operation is carried out within a treatment/calendar year. Preparatory treatment is generally completed prior to June 1 so that any vegetation approaching the minimum clearance distance is treated prior to new annual growth. Foliar treatment shall be completed prior to October 1 of each year. Certain sites requiring hand cutting, mowing, and/or cut stump treatment may be carried out after October 1. National Grid contractors treat all vegetation approaching the minimum clearance distance prior to June 1 of a treatment year.

Cycle lengths for the right-of-way floor program range from four to five years. Rights-of-way that received floor treatment during the years 2004 though 2008 are presented in an excel spreadsheet titled "National Grid's Massachusetts Integrated Vegetation Management Maintenance 2004-2008." **(Exhibit 39)**

b. Off Right-of-Way Danger Tree Program

National Grid's rights-of-way are generally cleared to their full width consistent with legal real estate rights and/or permits for initial construction of electric lines. The forested landscape, beyond the maintained right-of-way, contains trees that are tall enough and close enough to electric conductors to be capable of growing or falling into the lines. These trees are classified as danger trees and hazard trees. A danger tree is a tree on or off the right-of-way that, if were cut or failed, could contact electric lines. A hazard tree is a danger tree, which due to species and/or structural defect, is likely to fail and fall into the electric facility. National Grid prunes or removes danger trees and hazard trees to reduce the risk of off right-of-way tree-caused interruptions.

Trees are pruned to achieve "At Time of Vegetation Management Clearance Distance" from vegetation, in a radius around the conductor, at the time of vegetation management. These clearances are defined in the National Grid Transmission Forestry Right-of-Way Vegetation Management Specification 2008-2009. (Exhibit 38). Danger tree cycles for transmission and sub-transmission line right-of-ways range from four to ten years. Please refer to the excel spreadsheet titled "National Grid's Massachusetts Transmission and Sub-Transmission Danger Tree Program 2004-2008" for danger tree work conducted on transmission and sub-transmission right-of-ways from 2004-2008. **(Exhibit 40)**

National Grid's Transmission Forestry staff is responsible for inspecting vegetation conditions on rights-of-way. Inspections are carried out for several purposes including, but not limited to: determination of treatment efficacy of herbicide floor work following work completion by contractors (the spring following treatment); evaluation of efficacy of floor maintenance cycle length; and planning danger tree work and patrolling the transmission system to find vegetation conditions that are an imminent threat to the reliability of the electric system.

It is important to note that, during Winter Storm 2008, all vegetation-caused transmission interruptions were caused by off right-of-way trees.

10. Discuss Grid Reliability Standards Issues and Infrastructure Management, Including Scheduling of Line Maintenance, and Transmission Maintenance Interruption Scheduling

Distribution

To address safety and reliability, National Grid embarks on a number of activities, including visual inspections, operational checks, and maintenance.

Distribution Overhead Lines – Inspection and Maintenance

National Grid furnished the Department with a copy of its Electric Operating Procedures and Overhead Distribution Standards Manual on December 3, 2008, in D.P.U. 08-78. National Grid's Electric Operating Procedures provide direction to workers on complex operating issues, inspection and maintenance, and regulatory requirements. The Company provides a copy of the manual to each crew that performs work on lines. National Grid's Overhead Distribution Standards provide construction and design requirements for overhead field and design workers. National Grid provides updates to the Overhead Distribution Standards, annually, along with training, as appropriate, for any changes.

National Grid's Electric Operating Procedures and Overhead Distribution Standards were developed through a review of previous procedures, practices, bulletins, tailboard topics, and standards. Many Electric Operating Procedures and Overhead Distribution Standards have been revised to incorporate the best practices of either the legacy company or industry leaders. In addition, through the use of the incident analysis process, the Company has developed procedures and standards, together with revisions, to the Electric Operating Procedures and Overhead Distribution Standards, where needed.

National Grid will begin implementation of the five year inspection and maintenance cycles outlined in Electric Operating Procedure D004 in the first quarter of 2009. The Company provides classroom and field training to personnel inspecting facilities, per these procedures. Prior to, and until the full implementation of the inspection and maintenance cycles, feeder patrols are performed, annually, for all mainline, and repairs made, as appropriate. Infra-red inspection of distribution feeders are also performed, as conditions require.

Asset Replacement and Reliability Programs

In addition to inspection and maintenance activities, National Grid performs a number of programs that are designed to address asset replacement and improve system reliability performance. A brief description of the most significant of these programs follows:

a. Wood Poles

This strategy provides an approach for managing the Company's distribution wood poles, which is a very large asset class (approximately 750,000 poles in Massachusetts) and the foundation of the Company's overhead system. A computer model is currently used to create a ranked list of poles targeted for replacement. This model is based on asset data within the GIS, as well as wetland data. This ranked list is used as a starting point for pole inspections conducted to confirm pole condition prior to actual replacement.

Beginning in 2009, Inspection and Maintenance Program results will be used to generate replacement candidates based on condition. This program will inspect 20 percent of all poles on a five year cycle. The strategy will provide for the timely replacement of any visibly damaged or deteriorated asset prior to the next inspection cycle.

b. Feeder Hardening

This strategy was developed to specifically address overhead deteriorated equipment and lightning related interruptions on distribution feeders. These two causes are major drivers for distribution feeder reliability across the system.

Asset replacement models are used to analyze data from the reliability source systems related specifically to deteriorated overhead distribution line equipment, lightning, and animal interruptions, respectively. This reliability data is combined with feeder asset data (overhead circuit miles) to create a framework to assess the performance of the feeder and determine the potential for reliability improvement through the Feeder Hardening Program.

The output of this modeling process is a ranked list of feeders, which is updated annually to support the selection of feeders. This ranked list is reviewed and adjusted based on the expertise of division engineering groups. Recent significant changes or near-term planned changes to a selected feeder are typical reasons for skipping a feeder and moving to the next best candidate.

Current plans call for the completion of this strategy in FY2010/2011 with the Inspection and Maintenance Program taking over the routine inspection and maintenance of distribution feeders. This decision is based, in part, on recent improvements to the Inspection and Maintenance Program, streamlining the identification and execution of work found through inspection.

c. Distribution Line Recloser Application

This strategy provides line recloser guidelines to assist with the proper location and installation of reclosers on overhead distribution feeders. As a general guideline, the strategy envisions installing at least one recloser on every 15 kV class radial feeder with significant overhead three-phase exposure (i.e., more than ten miles).

Additionally, any circuit identified as a desirable candidate from the recloser model or Engineering Reliability Review Program would be considered. Candidates will compete for inclusion in the budget based on their relative cost versus their potential to reduce customer interruption minutes.

d. Engineering Reliability Reviews

The requirements for engineering reliability reviews are covered by Distribution Asset Management Guideline 012, which is summarized below:

The Network Asset Planning group is responsible for generating the list of worst performing feeders during the preparation of the Electric Service Reliability Report filed annually in accordance with Case 90-E-1119. The list of feeders includes interruptions associated with supply issues (transmission or substation) and excludes major storms. From the list, feeders are selected for an engineering reliability review. Each review includes:

- Review of historical reliability data. One year and three year for current issues and trends.
- Review of recently completed and/or future planned work that is expected to impact reliability.
- Review the need for the installation of radial and/or loop scheme reclosers.
- Review for additional line fuses to improve the sectionalization of the feeder.
- Comprehensive review of the coordination of protective devices to ensure proper operation.
- Review for equipment in poor condition.
- Review of heavily loaded equipment.
- Review for other feeder improvements, such as fault indicators, feeder ties, capacitor banks, load balancing, additional switches to improve switching time, and/or primary re-conductoring (overhead and/or underground).

Substation Maintenance

National Grid provided its Substation Maintenance Procedures and Substation Maintenance Standards to the Department on December 3, 2008, in D.P.U. 08-78.

Substation Maintenance Procedures and Substation Maintenance Standards provide a uniform approach for maintenance of substation equipment. These procedures and standards specify the minimum requirements for maintaining substation apparatus. The goal of this maintenance program is to provide an optimal level of reliability, service, quality, safety, appearance, and economic life of substation assets. The Substation Maintenance Procedures and Substation Maintenance Standards describe items checked and tests performed during visual and operational, in-service, diagnostic, internal, and acceptance inspections, and after overhauls, and retrofits. Substation Maintenance Standards outline the maintenance requirements and detail the criteria that determine when equipment inspections are triggered. Substation Maintenance Procedures provide

detail into how maintenance tasks are performed, tools and equipment required, and reference material necessary to perform the inspections.

Development of the Substation Maintenance Procedures and Substation Maintenance Standards began in 2001. They replaced the Electrical Maintenance Standards utilized in New England and the Electric Operating Procedures in New York that were related to substation maintenance. The current Substation Maintenance Procedures and Substation Maintenance Standards were created utilizing input from the utility industry, in-house substation maintenance technicians and supervisors, prior National Grid substation maintenance documents, and equipment manufacturer's instruction manuals. Documents are updated on an as-needed basis through a change request process and reissued.

As stated, substation inspection or visual and operational inspection of each substation and switchyard is a key element in the National Grid preventive maintenance program. Visual and operational inspections are performed with the apparatus in service and are designed to detect abnormal conditions before the apparatus is damaged or a customer interruption occurs. Visual and operational inspections are used to:

- Verify the security of fences, gates, et cetera that prevent entry of the public, and provide a legal record of their inspection;
- Detect any hazards to Company employees or the public;
- Verify that animal protection measures are present and in good condition;
- Detect abnormal conditions before the apparatus is damaged or a customer interruption occurs;
- Collect data (counter readings, fault operations, et cetera) used to prioritize individual apparatus inspections; and
- Collect data (regulator travels, load readings, relay targets, et cetera) used for system operation purposes.

Each transmission and distribution substation and switchyard will have a visual and operational inspection at least bimonthly. Data collected during the visual and operational inspection is one of the elements used by Asset Information and Maintenance Management System to prioritize individual apparatus for complete and diagnostic inspections. The system prioritizes maintenance scheduling for substation equipment based on several factors, including the date of last inspection, number of operations, manufacturers' recommendations, and other factors applicable to the specific type of equipment. The system calculates a "critical number" for each piece of equipment based on those factors. The critical number will continue to increase until the work for that unit of equipment has been completed.

Historically, National Grid has seen a correlation between equipment "mis-operation" and a critical number value greater than 500. As a result, the Company established internal goals to keep critical numbers below the 500 level. If the critical number for a piece of equipment greatly exceeds 500, it is usually due to the inability of equipment

to be removed from service for maintenance. Such exceptions are noted and monitored closely.

Transmission

The Energy Power Act of 2005 created a new section 215 of the Federal Power Act requiring the Federal Energy Regulatory Commission ("FERC") to certify an Electric Reliability Organization. The Electric Reliability Organization is charged with improving reliability and accountability of users, owners, and operators of the bulk power system. In 2006, FERC certified the North American Electric Reliability Corporation ("NERC") as the Electric Reliability Organization. FERC ordered 83 reliability standards enforceable as of June 2007. Maintaining a high standard of reliability is of the utmost importance to National Grid. The Company has processes and procedures in place to maintain compliance with NERC reliability standards. The following paragraphs discuss the specifics related to transmission line maintenance and transmission interruption scheduling.

a. Transmission Line Inspection and Maintenance Program

The goal of National Grid's inspection program is to verify the condition and/or operability of the various pieces of equipment on the system. There are three different types of inspections undertaken by the Company:

- **Ground-Based Inspections**: Transmission patrols are conducted by a line-qualified worker who can identify hazards, deficiencies, or non-standard construction conditions. The Company began a program in 2008 to examine each transmission circuit by this method once every five years.

- **Aerial Helicopter Inspections**: Aerial helicopter inspections include visual observations of exposed components of transmission lines, their supporting structures, and the condition of the rights-of-way. Each National Grid transmission line in Massachusetts is patrolled by this method twice each calendar year.

- **Infra-red Inspections**: Infra-red inspections include an aerial patrol using infra-red sensors to identify potential weak spots in overhead conductors and connections. Every circuit is inspected by this method once each calendar year.

Follow up for any items found during the above listed routine inspections are prioritized and repaired as follows:

- Level 1 – repaired within five days.
- Level 2 – repaired within six months.
- Level 3 – repaired within two years.
- Level 4 – noted by the Asset Management department.

b. Transmission Maintenance Interruption Scheduling

The control centers at both ISO-NE and National Grid have a primary responsibility to maintain the reliability of the bulk power system. This is achieved through adhering to various operating procedures and good utility practices. The following are key procedures/guidelines in how National Grid meets that responsibility:

- ISO New England Master/Local Control Center Procedure No. 2, Abnormal Conditions Alert (Exhibit 20).
- ISO New England Operating Procedures No. 3, Transmission Outage Scheduling (**Exhibit 41**)[2] and National Grid New England Control Center/REMVEC II Operating Procedure: 3, Scheduling Outages of New England Control Center/REMVEC Transmission Facilities (**Exhibit 42**).
- ISO New England Operating Procedures No. 19, Transmission Operations (Exhibit 18) and National Grid New England Control Center/REMVEC II Operating Procedure: 19, Transmission Operations (Exhibit 19).
- National Grid United States Operations Transmission Operating Procedure TOP-08, Transmission Outage Planning (**Exhibit 43**).

Anytime potential severe adverse weather is forecasted for the National Grid service area, the Network Operations management team, led by the Control Room, reviews the expected state of the transmission system (as does ISO-NE). National Grid will review all current interruptions and determine what equipment should be returned to service, in advance, as a preparation for the weather event. Requests for equipment interruptions during and immediately following the expected weather event are reviewed, and, in most cases, cancelled.

Prior to Winter Storm 2008, National Grid took the following actions:

- The Company returned several lines to service, which were out for maintenance:
  - Millbury #5, the E-5 terminal;
  - Pawtucket – Somerset, T-7 line; and
  - East Bridgewater – Bryant St, E-20/L-1 line

- The Company also cancelled several scheduled jobs, most notably:
  - E. Methuen – Golden Rock, G-133W line; and
  - Golden Hills – Maplewood, F-158 line

Not all lines were fully returned to service prior to the storm. National Grid had two transmission lines with open air gaps in each line to facilitate construction activities and maintain reliability. It was determined that there was no reliability advantage to

[2] Please note that Appendix A, D, E, and F to Exhibit 41 are not included because they contain critical energy infrastructure information. National Grid can provide these Appendices to the Department, upon request, on a confidential basis.

restoring these air gaps, as customer load was supplied by dual sources. These lines were:

- Bellows Falls – Flagg Pond, I-135N line; and
- Ward Hill – South Danvers, C-155N line

11. Identify Company Practices That Require Improvement and Propose Modifications

Based upon internal reviews, National Grid assessed its performance during Winter Storm 2008 and identified the following items that it plans to further investigate, review, or modify in order to improve future storm performance:

1. National Grid should investigate the possibility of formalizing the assignment of a transmission liaison within the New England Emergency Operations Center and expanding the distribution list for the transmission line status report to further increase communication between National Grid's Transmission and Distribution organizations during major storms. (Note: plans exist to relocate the Transmission Restoration Room to be co-located with the New England Emergency Operations Center in Northborough in the future).

2. National Grid should identify management employees with overhead line experience and maintain and refresh clearance and control qualifications annually.

3. National Grid should implement and maintain a program to bring back clearance and control qualified retirees and maintain their qualifications through annual training.

4. National Grid should investigate the possibility of expanding Gas Distribution's role during a major storm to include managing service restoration functions.

5. The ability to fuel unleaded vehicles remotely requires investigation, as this currently is not allowed without the use of a Stage I or II vapor recovery system.

6. National Grid should review the PowerOn and Resources on Demand systems for performance and functionality improvement opportunities related to major storms, and provide job aids to enhance supplemental users with these systems.

7. Purchase Orders for hotels need to be re-established on some accounts, and maintained annually.

8. National Grid should investigate the possibility of developing a single, integrated set of Electric Emergency Procedures, universally applicable across all of National Grid, taking into account, among other things, best practices company-wide, and implement and train employees at all levels in the Incident Command System.

9. The outside mutual assistance crew information pamphlet should be updated.

10. National Grid should review estimated time of restoration processes to identify possible opportunities to enhance the availability of restoration information for customers.

11. National Grid should investigate the possibility of instituting additional across line of business opportunities to further supplement the Company's response to major storm events and ascertain that it has identified all potential resources.

12. Review the need to establish a "family hot-line" for employees to assist in securing their home/family where power outages or storm damage are impacting them personally, to enable their prompt report to work.

13. National Grid should investigate the possibility of enhancing the critical care notification process by coding critical care customers into the PowerOn system in the same fashion that life support customers are coded.

14. National Grid should develop a process for communications between different organizations within the Company involved in storm restoration efforts.

Conclusion

As detailed in this report, National Grid's restoration effort during Winter Storm 2008 demonstrated the effectiveness and flexibility of the Company's emergency plans, as well as its ability to execute those plans. While enduring adverse weather and hazardous field conditions – through pouring rain, sleet, and snow – the employees of National Grid remained steadfast in their mission to restore the service of each and every one of the approximately 294,000 customers in Massachusetts impacted by the storm. Not only did National Grid complete the restoration of its customers by Saturday, December 20, despite a storm that spread destruction in 146 of the 169 communities in Massachusetts served by the Company, it also provided mutual assistance to other utilities in Massachusetts to help restore their customers.

Recognizing the collective needs of the citizens in the communities impacted by the storm, National Grid, on December 14, donated $75,000 to the American Red Cross of Central Massachusetts and $50,000 to the American Red Cross of Merrimack Valley. In addition to the monetary gift, many National Grid employees not involved directly with the restoration effort volunteered their time and energy during the weeks after the storm at numerous American Red Cross-sponsored activities and shelters.

In closing, National Grid is proud of its response to Winter Storm 2008, which is detailed fully in this report, and especially thankful to its customers, municipalities, and government officials for their patience and support through this storm.

List of Exhibits

No.	Title
1	Storm damage and restoration photographs
2	National Grid New England Electric Emergency Procedures
3	National Grid US Transmission Emergency Restoration Plan
4	National Grid Construction Delivery Emergency Storm Roles procedures
5	EEI Mutual Assistance Agreement
6	EEI "Suggested Governing Principles Covering Emergency Assistance Arrangements Between Edison Electric Institute Member Companies"
7	EEI Mutual Assistance Agreement Signing Companies as of October 30, 2007
8	NEMAG Charter
9	NEMAG Procedure
10	Table that depicts the external crew compliments assigned to Massachusetts
11	Table that depicts National Grid distribution crew assignments by platform, date, and location
12	Table that depicts National Grid distribution crew coverage by assigned area
13	Table that depicts National Grid transmission crew assignments
14	National Grid Damage Assessment Procedure
15	National Grid Electric Emergency Procedure .100.30, § 3.3 Restoration Sequence
16	"Notice of Life-Sustaining Equipment" form
17	List of critical facility codes
18	ISO New England Operating Procedures No. 19, Transmission Operations[3]
19	National Grid New England Control Center/REMVEC II Operating Procedure: 19, Transmission Operations
20	ISO New England Master/Local Control Center Procedure No. 2, Abnormal Conditions Alert
21	ISO New England Operating Procedures No. 12, Voltage and Reactive Control
22	National Grid New England Control Center/REMVEC II Operating Procedure: 12, Voltage and Reactive Control
23	Information provided to the Customer Contact Center representatives
24	Sample letter that was faxed to public officials alerting them that the Merrimack Valley Municipal Room was opened (provided for sample purposes)
25	List of municipal officials who were contacted concerning the opening of the Merrimack Valley Municipal Room (provided for sample purposes)
26	List of public officials invited to participate in the conference calls in the Merrimack Valley (provided for sample purposes)
27	Communication to the Customer Contact Center regarding mutual assistance, safety, and storm information

[3] Please note that Appendix D to Exhibit 18 is not included because it contains critical energy infrastructure information. National Grid can provide Appendix D to the Department, upon request, on a confidential basis.

28	Sample distributed news releases
29	Sample media scripts
30	Sample news coverage of Winter Storm 2008
31	National Grid Safety and "Thank You" Advertisements
32	Chart that depicts media outlets/placements; publication circulation; and placement timing
33	National Grid Distribution Vegetation Management Strategies
34	Distribution Vegetation Maintenance Schedule - Massachusetts
35	National Grid's New England Distribution Line Clearance Specifications
36	Transmission Five Year Right-of-Way Vegetation Management Plan 2004-2008
37	Transmission Forestry 2008 Right-of-Way Yearly Operational Plan
38	Transmission Forestry Right-of-Way Vegetation Management Specification (2008-2009)
39	National Grid's Massachusetts Integrated Vegetation Management Maintenance 2004-2008
40	National Grid's Massachusetts Transmission and Sub-Transmission Danger Tree Program 2004-2008
41	ISO New England Operating Procedures No. 3, Transmission Outage Scheduling[4]
42	National Grid New England Control Center/REMVEC II Operating Procedure: 3, Scheduling Outages of New England Control Center/REMVEC Transmission Facilities
43	National Grid United States Operations Transmission Operating Procedure TOP-08, Transmission Outage Planning

[4] Please note that Appendix A, D, E, and F to Exhibit 41 are not included because they contain critical energy infrastructure information. National Grid can provide these Appendices to the Department, upon request, on a confidential basis.

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