

IR 15-047



**Public Service  
of New Hampshire**

A Northeast Utilities Company

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**Matthew J. Fossum**  
Senior Counsel

January 29, 2015

NHPUC JAN29'15 PM 3:45

Debra A. Howland  
Executive Director  
New Hampshire Public Utilities Commission  
21 S. Fruit St., Suite 10  
Concord NH 03301

RE: Post-Storm Review of Public Service Company of New Hampshire  
November 2014 Snowstorm – After Action Review

Dear Director Howland,

Consistent with Section 5.2 of Appendix A of the Commission's After Action Review – December '08 Ice Storm, issued December 3, 2009 as restated in Section 5.2 of Appendix D of the Commission's report on The October 2011 Snowstorm, issued November 20, 2012, please find enclosed with this letter Public Service Company of New Hampshire's ("PSNH") post-storm review of its response to the November 2014 Snowstorm, which affected approximately 207,000 PSNH customers on and around November 26, 2014.

Please contact Dean C. Desautels, PSNH's Manager of Emergency Preparedness, should you have any questions. Thank you for your assistance with this matter.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Matthew J. Fossum".

Matthew J. Fossum  
Senior Counsel

Enclosure

Cc: Tom Frantz, Randy Knepper



**Public Service  
of New Hampshire**

The Northeast Utilities System

# **2014 Thanksgiving Snow Storm**

## **After Action Report**

November 26, 2014 to November 30, 2014

Report Date: January 29, 2015

## I. Introduction

On November 26 and 27, 2014, Public Service Company of New Hampshire's (PSNH's) service territory experienced an intense heavy, wet, snow storm. The consistency of the snow was such that it adhered to trees and limbs, causing numerous tree-related failures and extensive damage to the electric system. Over 40% of the PSNH customer base lost power during this event, making it the fourth worst storm in PSNH's 88 year history.

The storm caused damage across the entire state; however, the hardest impacted areas of the state were PSNH's Central, Southern and Western Regions. Most communities in these regions reported over 12" of snow with Madison reporting the highest total in the state at 18.4".

## II. Emergency Preparedness

PSNH has developed and implemented an Emergency Response Plan (ERP) that aligns with the National Incident Management System (NIMS) and the Incident Command System (ICS.) The ERP provides guidance for the monitoring of events that pose a potential risk to the electrical distribution system as well as classification guidelines for the hazard. The company uses an Energy Event Index (EEI) provided by Schneider Electric Weather Services (Schneider) to gauge the potential event severity based on the forecasted weather, with an EEI of 1 being least severe and an EEI of 5 being catastrophic.

On Monday, November 24, 2014 PSNH discussed the possibility of a holiday storm event during the Company's daily Reliability Conference Call in order to raise awareness. At that time there were no active weather advisories, watches or warnings. An extensive evaluation of available field and support resources was completed as the weather event was anticipated to impact the region over the Thanksgiving holiday. A determination was made to assess availability of local contracted resources in the event the forecast deteriorated.

On Tuesday, November 25, 2014 at 0602 Schneider issued a weather forecast with an EEI of 3 due to the potential of heavy snow and high winds across portions of PSNH's service territory. At 0640 PSNH Emergency Preparedness issued a company-wide PSNH Weather Advisory with a Readiness Condition of "Monitoring" in response to the forecast. During the 0830 Reliability Conference Call held that day a plan was developed to hold all available resources through the end of the day Wednesday, November 26<sup>th</sup>. Following a call with the National Weather Service in Grey, ME a PSNH Emergency Planning Advisory was issued at 0915 with a Readiness Condition of "Warning". Additionally, outreach was initiated to customers with an identified dependency on electric service for critical medical needs.

The company initiated preparedness activities, including storm preparedness conference calls and directives to the Emergency Response Organization (ERO) to review emergency plans and checklists. Northeast Utilities Emergency Preparedness (NUEP) group conducted a system wide preparedness call at 1400 on November 25<sup>th</sup> in order to assist in the coordination of preparedness activities across New Hampshire, Massachusetts and Connecticut.

At 0602 on Wednesday, November 26<sup>th</sup> Schneider issued the morning forecast with an EEI of 3 for Central South, Lakes and Western Regions with High Confidence. The company immediately issued a revised Weather Advisory and continued to secure and confirm local contracted line resources. The PSNH Incident Command Center (ICC) was partially activated at 1200 in anticipation of increased weather related outages and to assist with the deployment of additional resources to affected areas.

### III. Emergency Response

PSNH began incurring storm-related damage at approximately 1205 on Wednesday, November 26<sup>th</sup>. 72.5 PSNH Line Crews\* and 51 Contracted Line Crews began responding to priority calls as directed by the Area Work Centers (AWCs). At 1500, with approximately 9,600 customers interrupted, the ICC was prompted to full activation and issued an ERP Event Advisory at 1517.

The ICC began directing the movement of restoration resources from less impacted areas to the Keene, Milford, Bedford and Hooksett AWCs to assist with restoration efforts. A request for 75 external line crews was made to the NUEP group at 1620 as additional NU company resources were not immediately available due to damage in Connecticut and Massachusetts. A North Atlantic Mutual Assistance Group conference call was convened where PSNH's request for additional line crews was submitted.

NUEP conducted a third system wide conference call at 2200, at which time PSNH had approximately 142,000 customers interrupted. The company made a further request for 230 additional line crews as well as restoration support resources. It was directed that all available NU resources would support restoration efforts in NH as work was completed in other states. The support was to include Incident Management Assistance Teams (IMATs) to support Operations, Planning and Logistics as well as traditional field resources.

**Resource Procurement** - Significant storm events, such as the Thanksgiving Snow Storm, require resources beyond those typically available within PSNH's normal operating structure. Prior to the event the decision was made to secure additional contracted line resources from local sources. PSNH initially obtained 51 local contractor crews to be available for 0900 on the November 26<sup>th</sup>. These crews supported the 72.5 internal PSNH Line Crews. In addition, 92 vegetation management crews were pre-staged, along with 10 service crews, strategically throughout the State.

The procurement process continued throughout the day on November 26<sup>th</sup> and 27<sup>th</sup> with NUEP reaching out for foreign utility and contractor resources outside the New England area, this included securing resources from Hydro Quebec. At peak the company deployed 81 internal line crews, 119 NU affiliate line crews (Connecticut Light & Power, Western Massachusetts Electric, and NSTAR Electric,) and 417 contractor/foreign utility crews. Additionally, the company deployed 245 vegetation management crews at peak.

Support resources, such as Damage Assessment teams, Planning, and Safety, were also secured and deployed in support of NH restoration. The company utilized management teams from sister companies to manage Staging/On-Boarding activities as well as Service work in the hardest hit areas. At peak PSNH had approximately 1,050 support resources assisting restoration in NH.

\* A line crew consists of a minimum two (2) line workers and their associated vehicles and equipment.

**Resources on PSNH System:**

BEGINNING DATE	NU			PSNH Service Crews	NU Affiliate Service Crews	Contractor Service Crews	Total
	PSNH Line Crews	Affiliate Line Crews	Contractor Line Crews				
Wednesday, November 26, 2014 as of 9am	72.5	0	51	10	0	0	133.5
Thursday, November 27, 2014 as of 9am	79	29	132	16	0	0	256
Friday, November 28, 2014 as of 9am	80.5	56	329	20	0	30	515.5
Saturday, November 29, 2014 as of 9am	81	119	417	22	17	47	703
Sunday, November 30, 2014 as of 9am	80.5	119	204	23	17	48	491.5

**Resource Deployment** - PSNH pre-deployed resources based upon the forecasted weather and anticipated trouble areas. The early deployment of crews worked well and was effective as travel conditions hampered the ability to move resources during the initial phase of the storm. Additionally, crews were quickly moved from areas with little or no damage, such as Portsmouth, to areas with more significant damage. Areas were also identified for deployment of follow-on resources as they became available.

The company established a Staging/On-Boarding site at the Manchester Airport on the morning of November 27<sup>th</sup>. The site checked in and safety briefed resources assigned to the Milford, Bedford, Hooksett and Nashua AWCs. A second Staging/On-Boarding site was established at the Keene airport on November 27<sup>th</sup> to more efficiently process resources arriving into the state from the west. The Keene Airport site also served as a Satellite location directing restoration resources.

**Restoration Prioritization** - PSNH’s highest priority is the Life Safety of the public and employees. Consistent with PSNH’s restoration philosophy, as outlined in the ERP, PSNH initiated a Make Safe “cut and clear” process during the Thanksgiving storm to protect the public and to enable municipal and state agencies to clear and open roads. The process was fully implemented on November 27<sup>th</sup> and is viewed as a leading practice.

In terms of repairing the electric system, PSNH’s restoration process initially focused on the restoration of transmission lines, substations, and critical customers. The restoration of circuit backbones followed, to ensure the maximum number of customers was restored in the minimum amount of time. Finally, smaller lateral lines and individual customers were restored. Throughout the restoration event, a high priority was given to restoring power to locations necessary to the health and safety of the community, such as; hospitals, water supplies, and sewage treatment facilities.

**Customer Restoration** - At peak, 207,359 PSNH customers were without power on Thursday, November 27, 2014 at 1100. The peak number of uncorrected troubles was 1,200 at 0400 on November 28, 2014. A total of 3,100 outage troubles were reported within the timeframe of the storm event. Power was restored to virtually all of PSNH's customers by approximately 1500 on Sunday, November 30, 2014. Restoration of service for the remaining isolated and/or individual customers was completed throughout the day on November 30, 2014. In total, 355,921 PSNH customers were impacted by the event. The PSNH ICC closed at 1600 on Sunday, November 30, 2014.

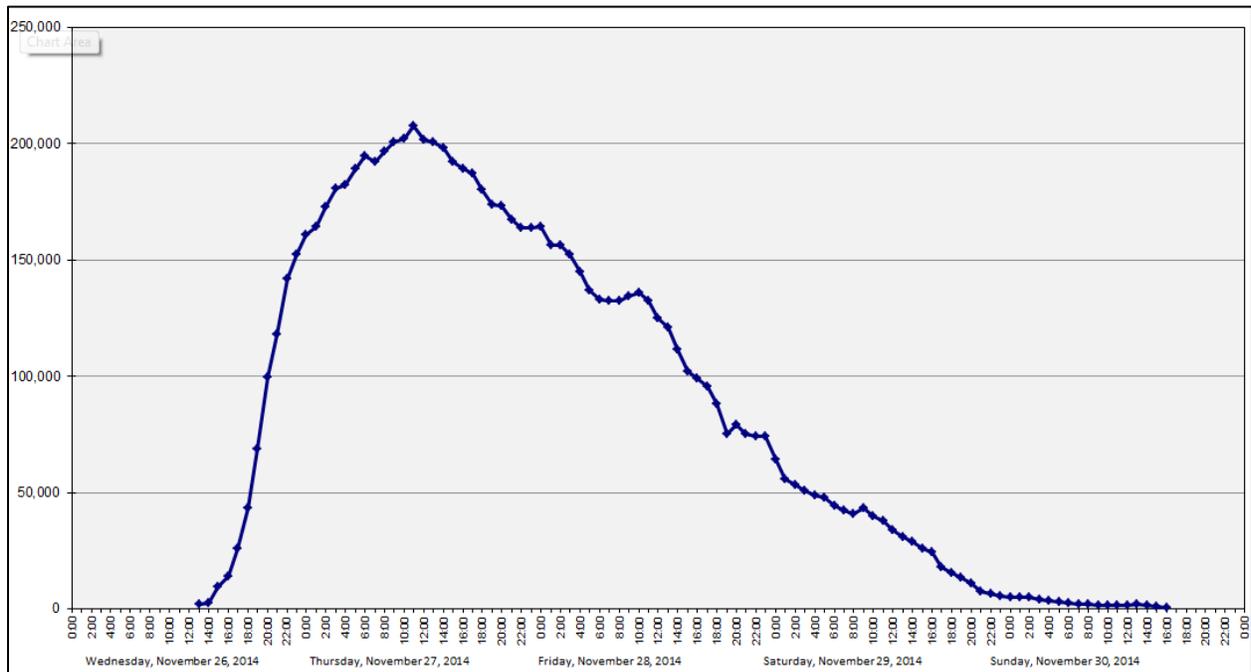
**Detail of Service Restoration:**

Date	Time	Customers Without Power	Customers Restored in Each 12 Hour Period	Total Customers Restored Since Peak	% of Customers Restored Since Peak
<b>Wednesday November 26, 2014</b>	1500*	9,678			
	1800	43,521			
<b>Thursday November 27, 2014</b>	0000	160,621			
	1100	207,359			
	1200	201,360	5,999	5,999	3%
<b>PEAK OUTAGES</b>					
<b>Friday November 28, 2014</b>	0000	163,999	37,361	43,360	21%
	1200	124,965	39,034	82,394	40%
<b>Saturday November 29, 2014</b>	0000	63,999	60,966	143,360	69%
	1200	33,802	30,197	173,557	84%
<b>Sunday November 30, 2014</b>	0000	5,145	28,657	202,214	98%
	1200	1,409	3,736	205,950	99%
	1600**	292	1,117	207,067	99.9%

\* PSNH ICC Fully Activated

\*\* PSNH ICC Deactivated

**Restoration Glide Path:**



**Storm Impact** – The majority of the damage caused during the Thanksgiving Snow Storm was from branch and tree failures triggered by the heavy wet snow. The vegetation damage led to numerous locations where wires were knocked down or broken, but relatively few poles were broken. During the restoration the company replaced 59 poles, 157 cross arms and 129 transformers and re-strung 97,803 feet of conductor.

## **IV. Communications**

In addition to internal preparations, PSNH initiated an alert to the media outlets on Tuesday, November 25, 2014. The Customer Experience team used telephone system technology to proactively send notification to customers with an identified dependency on electricity for critical medical needs, stating that heavy, wet snow was forecasted for our service territory Wednesday through Thursday, which may result in significant power outages.

The company also continued to use social media outlets, such as Twitter and Facebook, to convey preparedness messages and restoration updates. As of November 30, 2014 the company had 13,259 Facebook “likes”, up 2,604 during the storm period, and 22,136 Twitter followers, up 2,992 over the storm period. Messaging on Twitter began at 1600 on November 25, 2014, with 348 “tweets” during the restoration period. Updates on Facebook began on November 26, 2014 with 82 posts during the restoration period. Social media updates reached almost 35,000 individuals.

The Company provided real time updates to the PSNH website Outage Map, which displayed the number of customers without power by town. The company experienced a brief period where automatic updates were not available due to IT issue which has since been corrected. During this time the company calculated and published a list of outages by town. Additionally, 15 Press Releases were issued throughout the event, with the first issued at 2300 on November 26<sup>th</sup>. PSNH also increased communications with “live” and “taped” television and radio informational updates, interviews and reports from the field.

As outlined in the PSNH ERP, PSNH initiated communications with community and state officials. PSNH dispatched Division Community Relations Managers along with trained staff members to serve as Municipal and Government Liaisons to work with local town officials and legislators out to the individual Area Work Centers throughout the service territory. These individuals were deployed to provide direct and regular updates to community officials and were very well received and appreciated by the impacted communities. Additionally, the company had dedicated individuals assigned to work with State officials to address both regulatory and emergency management concerns.

## **V. Lessons Learned**

PSNH conducted an extensive After Action Review of the Thanksgiving Snowstorm event in accordance with its established procedures and guidelines. Each Operating Region and functional storm organization (i.e. Logistics, Planning, Communications, etc.) conducted a post storm “lessons-learned” team meeting. Feedback from these meetings included organizational strengths and organizational opportunities, as well as overall comments on event response. This feedback was consolidated and analyzed by the PSNH Emergency Preparedness organization in order to identify trends, root causes, and prepare notes for a facilitated “Lessons-learned” session with designated Section Chiefs, Branch Directors, and Unit Leaders.

On January 6, 2015 PSNH Emergency Preparedness facilitated such a session at Energy Park in Manchester. The session included individuals with key storm functions from across PSNH as well as key

support positions from Northeast Utilities. The purpose of the session was to review the feedback from team meetings and identify areas for improvement. These action-items are detailed below, along with recommendations that will be incorporated into a formal Improvement Plan (IP.) This process follows leading practices for incident review as prescribed by the Federal Emergency Management Agency (FEMA) Homeland Security Exercise Evaluation Program (HSEEP.)

**Item Number:** 2015-ERP-1

**Capability:** Public Information and Communications

**Observation:**

Social Media has become an increasingly predominant means of communicating outage related information to customers. The company has greatly expanded its use of social media outlets during actual events and there are opportunities to incorporate additional expansion for situational awareness and pre-event communications.

**Recommendation:**

PSNH should assess the ability to receive additional damage and outage related details, such as photos, from the field and relay such information to impacted customers. Additional information, such as outage causes and pictures of the damage, may help customers establish a level of situational awareness concerning the event and help clarify restoration times.

**Item Number:** 2015-ERP-2

**Capability:** Resource Management

**Observation:**

PSNH was able to leverage the large number of field and support resources available across Northeast Utilities and deploy a significant workforce in a relatively short amount of time. While this significant increase in the restoration workforce was instrumental in the restoration process, it provided several challenges logistically. Tracking, in-processing and lodging of resources was challenging due to the large number of resources deployed.

**Recommendation:**

PSNH Emergency Preparedness should work directly with Northeast Utilities Emergency Preparedness to establish an improved technological solution for the tracking of resource requests and the individuals assigned to fill those requests.

**Item Number:** 2015-ERP-3

**Capability:** Resource Management

**Observation:**

The existing Food and Lodging (F&L) process at PSNH relies on the timely and accurate completion of Crew Rosters and Crew Transfers to inform the Logistics section of support needs. In many cases this process was delayed due to the absence of accurate rostering information (see Item Number 2015-ERP-2) thereby preventing the F&L group from securing appropriate accommodations in a timely fashion. In several cases crews were lodged in areas outside their restoration zone, therefore requiring additional travel time.

**Recommendation:**

PSNH should investigate modifications to the existing Food and Lodging (F&L) process, and technology as needed, to allow for the more detailed tracking of inbound resources in order to more appropriately coordinate logistics support. F&L Process should be linked directly to process and technology improvements associated with rostering and resource tracking solutions identified in Item Number 2015-ERP-2.

**Item Number:** 2015-ERP-4

**Capability:** Worker Health and Safety

**Observation:**

PSNH established central Reception/On-Boarding sites at the Manchester and Keene Airports in order to check-in, brief, and outfit arriving field restoration resources. Activities at this site included verification of rosters and equipment, as well as Safety Briefings concerning the weather, terrain and any other system specific hazards. Arriving resources had an opportunity to discuss system configuration, voltage classifications as well as have any other issues addressed by a PSNH Safety professional. This process facilitated a rapid deployment to field work locations and increased productivity by eliminating or addressing safety related issues prior to movement to the field. While consistently employed for field restoration forces, the practice was not as consistently used among support resources, such as Damage Assessment Patrollers and Wire Guards, as they were often deployed directly to field work locations.

**Recommendation:**

The Company should expand current Reception/On-Boarding, in order to include field and support personnel assigned to assist with restoration activities, not just line and tree crews.

**Item Number:** 2015-ERP-5

**Capability:** Public Information and Communications / Community Preparedness

**Observation:**

Community Relations Specialists have been identified to manage the communication and relationship with each city or town served by PSNH. Leading up to the event these individuals were able to communicate preparedness activities and status in order to help coordinate company and municipal actions. Under the PSNH Incident Management structure, these functions are assumed by the Community Liaison when activated. In most cases the transition to the Incident Management structure was transparent to the town due to pre-event coordination and meeting. Clear understanding of roles, priorities and contact information established “blue sky” was then verified pre-event.

In some cases these individuals, either company or municipal, may not have been available over the holiday. Additionally, there were instances where changes in procedures or technology were not clearly communicated or understood, leading to confusion during the event. While a majority of these instances were mitigated real time through direct coordination between company and municipal personnel, it has highlighted an opportunity for additional training and resource allocation.

**Recommendation:**

The Company should investigate additional opportunities to communicate and build collaboration with municipal and state officials pre-event. Activities should include verification of contact information and communication of changes in processes or technology and how those changes affect restoration efforts. Additionally, activities should include those individuals with a storm role as a Community Liaison to help ensure alignment of expectations among all parties.

**Item Number:** 2015-ERP-6

**Capability:** Response and Restoration

**Observation:**

The PSNH Emergency Response Plan (ERP) provided for the ability for the company to transfer command and control of restoration activities from a centralized location to a decentralized location. This practice allows for the most efficient and effective deployment of restoration resources to the areas with the most significant customer impact. In past events this practice had been limited primarily to transfer among individuals normally assigned to the PSNH service area.

During the response to the Thanksgiving Snowstorm the practice was expanded to include the transfer of restoration responsibilities to NU employees from adjacent operating regions. This move was facilitated by the consolidation of policies and procedures as well as the standardization of equipment

and technology. Additionally, the ability to deploy managerial support in the form of Incident Management Assistance Teams (IMATs) greatly improved the efficiency of both field and support resources during this event. While the strategy of integrating outside management teams has significant merit, the process needs to be clearly defined and formally incorporated into the Emergency Response Plan.

**Recommendation:**

The Company should investigate opportunities to establish clear procedures for integrating management support into the restoration process in the form of clearly identified Incident Management Assistance Teams (IMATs.) Opportunities should include the integration of conventional restoration support, such as field based management teams, but also support based teams such as Incident Command Center staff, Logistics support, and Communications personnel. Associated procedures should be integrated into the Emergency Response Plan, trained upon and formally exercised.

**Item Number:** 2015-ERP-7

**Capability:** Response and Restoration

**Observation:**

The scope of restoration activities within the local area or work center has traditionally included all tasks, including the restoration and repair of both primary voltage circuits and secondary voltage customer services. The restoration activities for the Thanksgiving Snowstorm were segregated between primary and secondary with an isolated operations branch established to manage service restoration crews and address service-related priorities. This practice was managed by sister company personnel and allowed the PSNH management team to focus on the restoration of primary circuits with the resources most familiar with the geography and the equipment. This process greatly streamlined both the operational direction of the resources but also the coordination of logistical support to those resources.

**Recommendation:**

The company should investigate implementing a formal process and structure to facilitate the segregation of primary and secondary restoration activities as appropriate. Additionally, opportunities to integrate outside resources for the management and execution of secondary restoration activities should be investigated and incorporated into the procedure as appropriate.