

STATE OF NEW HAMPSHIRE
Before the
PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 10-001

UNITIL ENERGY SYSTEMS, INC.

DIRECT TESTIMONY

OF

THOMAS P. MEISSNER, JR.
RAYMOND A. LETOURNEAU, JR.
RICHARD FRANCAZIO

January 29, 2010

1

I. INTRODUCTION

2 **Q. Please state your names, titles and business addresses.**

3 A. Our names, titles and business addresses are as follows:

4

5 1.) My name is Thomas P. Meissner Jr., Senior Vice President and
6 Chief Operating Officer of Unitil Corporation ("Unitil"), and
7 Senior Vice President of its principal subsidiaries, Fitchburg Gas
8 and Electric Light Company ("FG&E"), Unitil Energy Systems,
9 Inc. ("UES") and Northern Utilities, Inc. ("NU"). My business
10 address is 6 Liberty Lane West, Hampton, New Hampshire 03842.

11

12 2.) My name is Raymond A. Letourneau, Jr., Director of Electric
13 Operations for Unitil. My business address is 6 Liberty Lane West,
14 Hampton, New Hampshire 03842.

15

16 3.) My name is Richard Francazio, Director of Emergency
17 Management and Compliance. My business address is 6 Liberty
18 Lane West, Hampton, New Hampshire 03842.

19

20 **Q. Mr. Meissner, please summarize your professional and educational**
21 **background.**

1 A. I have over 25 years of professional experience in the utility industry and an
2 extensive background in all areas of gas and electric energy delivery, including
3 distribution engineering; system planning; construction and maintenance; safety;
4 inventory and supply chain management; emergency response and restoration;
5 fleet and facilities management; metering and meter reading; system operations;
6 and related technology and asset management systems.

7

8 I joined Unitil in 1994 as a design engineer and was named Director of
9 Engineering in 1996, Senior Vice President of Operations and Engineering in
10 2003, and assumed my current responsibilities as Chief Operating Officer of
11 Unitil in 2005. My primary areas of responsibility are utility operations and
12 engineering. Prior to joining Unitil, I was employed for 10 years at Public
13 Service of New Hampshire where I advanced through a variety of positions in
14 Distribution Engineering, Southern Division Engineering, Seacoast Division
15 Engineering, and Key Accounts. The last position I held prior to joining Unitil
16 was that of Electrical Superintendent in Portsmouth.

17

18 I hold Bachelor of Science degrees in both Electrical Engineering and Mechanical
19 Engineering from Northeastern University, a Certificate in Electric Power
20 Systems Engineering from Power Technologies, Inc., and an MBA from the
21 University of New Hampshire. I am a registered Professional Engineer in the
22 State of New Hampshire.

23

1 **Q. Have you previously testified before the New Hampshire Public Utilities**
2 **Commission ("Commission")?**

3 A. Yes, I have testified before this Commission several times on matters pertaining
4 to Unitil's classification of facilities as either transmission or distribution
5 according to FERC's seven-factor test, operational concerns arising from
6 Verizon's transfer of jointly owned poles to FairPoint, and operational and safety
7 compliance aspects of Unitil's acquisition of Northern Utilities, Inc. and Granite
8 State Gas Transmission, Inc.

9

10 **Q. Mr. Letourneau, please summarize your professional and educational**
11 **background.**

12 A. I joined Unitil in 1996 and have 26 years of professional experience in the utility
13 industry. Before working for Unitil, I was employed by Public Service of New
14 Hampshire and Northeast Utilities. In 1996, I was hired as Manager of Operations
15 for Unitil Energy Systems – Seacoast (formerly Exeter & Hampton Electric
16 Company), and was appointed Director of Operations in 1999. I was appointed
17 Director, Electric and Gas Operations for Unitil Service Corporation in 2003,
18 where I was responsible for the construction, operation, and maintenance of the
19 gas and electric energy delivery system.

20

21 In 2008, I was appointed Director of Electric Operations, where I am currently
22 responsible for the construction, operation, and maintenance of the electric energy
23 delivery system, and have combined responsibility for both electric and gas in the

1 following functions: purchasing and stores; fleet management; administrative
2 services; and facilities. I am also responsible for labor relations and negotiations.

3

4 I received a Bachelor of Science degree in Electrical Engineering from Clarkson
5 University in 1983, a Certificate in Electric Power Systems Engineering from
6 Power Technologies, Inc. in 1990, and an MBA in Finance from Southern New
7 Hampshire University in 1992. Prior to joining Unitil, I held various engineering
8 and management positions in both distribution engineering and electric
9 operations.

10

11 **Q. Have you previously testified before the Commission?**

12 A. No. I have not, but I have previously testified before the Massachusetts
13 Department of Public Utilities.

14

15 **Q. Mr. Francazio, please summarize your professional and educational
16 background.**

17 A. Prior to joining Unitil in March 2009, I was employed for 25 years at National
18 Grid, and, before that, for five years at Florida Power & Light. I have 30 years of
19 professional experience in the utility industry with expertise in all aspects of the
20 distribution and transmission energy delivery business. Over the years, I held a
21 number of senior level positions at National Grid. I was the Vice President of
22 National Grid's NE Distribution Operations, which included Rhode Island,
23 Massachusetts and New Hampshire. My responsibilities included all aspects of

1 maintenance and construction as well as storm response. Later, I was Vice
2 President of Transmission Line & Substation Construction, where I was
3 responsible for the service company construction group based in New England
4 which included 70 transmission line construction workers, 140 substation
5 construction workers and similar numbers of contract crews. I worked closely
6 with asset management in the development of complete inspection and
7 maintenance programs. I also developed a plan to move the service company
8 model into the New York region of National Grid. As Vice President and
9 Director of Emergency Planning I was responsible for all of National Grid US
10 Incident Management procedures including storm emergency response, business
11 continuity planning, pandemic influenza preparations, strike preparations, gas
12 emergency response plans and corporate crisis management plan. As Acting
13 Director, I devised a plan to revise the company's emergency procedures to
14 reflect the National Incident Management System (NIMS) guidelines. In addition
15 I was the System Director for the emergency response center (a position I held
16 since 1995) and consistently coordinated restoration efforts across National Grid.

17
18 My current job responsibilities are primarily in the areas of Business Continuity
19 Planning, Emergency Management, Safety and Environmental Compliance and
20 Risk Management. I hold a Bachelor in Electrical Engineering from Roger
21 Williams College and an M.B.A. from Boston University.

22
23 **Q. Have you previously testified before the Commission?**

1 A. No, I have not. I have, however, previously testified before the Massachusetts
2 Department of Public Utilities.

3

4 **Q. What are the issues to be explored in this proceeding?**

5 A. On December 3, 2009, the Commission issued its After Action Review of the
6 December 2008 ice storm (“NHPUC Report”). Action Item 5.3 of the NHPUC
7 Report indicated that the Commission would open up this proceeding to examine
8 certain aspects of UES’ response to the ice storm, and in particular, Unitil’s
9 restoration strategies and crew assignments among its three service areas. This
10 action item comes at the end of a discussion in the NHPUC Report of Unitil’s
11 restoration strategies and priorities as they relate to the deployment of crews to its
12 New Hampshire and Massachusetts service areas.

13

14 The focus of this proceeding on crew deployment was also reflected in the
15 Commission’s Order of Notice opening the proceeding:

16 As UES is part of a holding company with electric utility
17 operations in two states, the issues involve actions and decision-
18 making by UES and by its parent, Unitil, on a company-wide basis.
19 Exploration of the issues will involve inquiry into the emergency
20 response resources available to UES and Fitchburg prior to the ice
21 storm, the deployment of those resources on behalf of UES and
22 Fitchburg, the responsibility for the deployment of those resources
23 and the reasons therefore, the impacts of the deployment on UES’
24 customers and what, if any, remedies are appropriate.
25

26 **Q. What is the purpose of the panel’s testimony?**

1 A. The purpose of this testimony is to address the issues identified in the
2 Commission's January 8, 2010 Order of Notice. The testimony discusses issues
3 that relate to the deployment of resources during the 2008 ice storm including
4 Unitil's restoration strategies and priorities, the procurement and allocation of
5 resources among service areas, and the impact of these activities on customers.
6 The testimony will also attempt to clarify and correct aspects of the October 28,
7 2009 report, "New Hampshire December 2008 Ice Storm Assessment Report,"
8 prepared by NEI Electric Power Engineering ("NEI Report"), that have been
9 relied on by the Commission in opening this docket. Unitil appreciates this
10 opportunity to directly address these matters and to respond to the Commission's
11 concerns.

12
13 **Q. Please identify Unitil's disagreements with the NEI Report.**

14 A. Unitil has two principal disagreements with the NEI Report as relates to this
15 proceeding. First, the NEI Report wrongly concludes that Unitil's restoration
16 strategy was to restore all customers at the same time, and therefore incorrectly
17 concludes that Unitil's restoration strategy was different than the other New
18 Hampshire utilities. Second, the NEI Report relies on summary data to form
19 conclusions regarding crew deployment, without exploring the underlying
20 restoration activities in order to reach valid and substantiated findings. In
21 addition, although Unitil and other New Hampshire electric utilities were
22 provided an opportunity to comment on a draft of the NEI Report, these
23 comments were generally not incorporated into the final report and the report

1 remains problematic in many areas, including those sections related to Unitil's
2 restoration strategy and crew deployment.

3

4 **Q. Please summarize your principal conclusions.**

5 A. Unitil applied reasonable and appropriate strategies to restore power both with
6 respect to the allocation of crews among its three service areas and the
7 prioritization of the work effort within each area to restore the maximum number
8 of customers in the shortest amount of time.

- 9
- 10 • The actions of Unitil during the December 2008 Ice Storm were consistent
11 with those of the other New Hampshire utilities in response to the storm, and
12 are also consistent with the industry practice.
 - 13 • Unitil allocated resources to its three service areas based on an assessment of
14 the amount and type of repair work to be completed, striving to optimize the
15 efficiency of the restoration effort and appropriately match available resources
16 to repair work and estimated restoration times.
 - 17 • Unitil prioritized its repairs to restore service to the largest number of
18 customers as quickly as possible, giving priority to public safety (wires
19 down), critical facilities, and critical needs customers.
 - 20 • Decisions often had to be made with limited information regarding system
21 damage, the type of damage, and the extent of repairs needed to restore large
numbers of customers, and were appropriate in the circumstances.

- 1 • Resource allocations among and between service territories across state lines
2 were insignificant and immaterial in comparison to the overall restoration
3 effort and the amount of resources needed to complete restoration.
- 4 • The pace of customer restoration in Unitil's New Hampshire territories was
5 comparable to other utilities, despite the loss of a significant contingent of
6 mutual aid crews.

7

8 **Q. How is the balance of the panel's testimony organized?**

- 9 A. The next section discusses Unitil's restoration strategies and priorities. Section III
10 addresses crew deployment decisions throughout the ice storm restoration effort.
11 Section IV describes actions taken by Unitil related to resource procurement and
12 allocation of these resources among service areas. Brief conclusions are
13 presented in Section V.

14

15

16 **II. UNITIL'S RESTORATION STRATEGIES AND PRIORITIES**

17 **Q. Please describe Unitil's approach to service restoration.**

- 18 A. As stated in Attachment 1 – UES Restoration Strategy, submitted as part of the
19 October 15, 2009 UES comments to the NEI draft report, Unitil's restoration
20 strategy is, in fact, identical to the restoration strategy other New Hampshire
21 electric companies. Priority is given within each service area to public safety
22 (wires down), critical facilities, and critical needs customers. Beyond that,

1 customers are restored “as rapidly as possible,” meaning that outages are
2 prioritized in order of greatest number of customers impacted and rapidity of
3 repair time.

4
5 When making resource allocation decisions among services areas, Unitil allocates
6 resources to its three service areas based on an assessment of the amount and type
7 of repair work to be completed, with the additional consideration of a number of
8 other factors that are more fully discussed in Section III of this prefiled testimony.

9
10 **Q. Please describe the issue that has been raised with respect to Unitil’s**
11 **approach to restoring power after the 2008 ice storm.**

12 A. The NEI Report erroneously concludes that Unitil’s strategy was to restore all of
13 its customers at the same time, an obvious impossibility. NEI recommended that,
14 “Unitil should adopt a storm restoration strategy that is based on achieving
15 restoration for the largest number of customers in the least amount of time,”
16 noting that this is the approach taken by the other New Hampshire electric
17 utilities. [*NEI Report, page II-49*]

18
19 NEI also stated that Unitil’s restoration effort was “adversely impacted because
20 the system area with the most damage rather than the most customers was
21 assigned the greatest amount of resources.” [*NEI Report, page II-49*]

22

1 **Q. What was the basis for NEI’s conclusion that Unitil was trying to restore all**
2 **of its customers at the same time?**

3 A. The NEI Report cites a single UES response to Staff data request 1-47 as the basis
4 for its conclusion. This data request and response is attached to this testimony as
5 Exhibit No. UES Panel-1. The data request asks about the process used to deploy
6 resources to affiliates across state lines during simultaneous outages. The answer
7 contains the following paragraph which appears to be the source of confusion:

8 The company's goal is to accomplish full restoration to all customers at
9 approximately the same time. Therefore, the operating center that has
10 the most amount of damage is assigned the greatest amount of
11 resources. If any operating center completes restoration while others
12 are still engaged, those resources are assigned to the other location.
13

14 It is important to note that the Staff data request 1-47 relates solely to the issue of
15 how resources are allocated between service areas for utilities, including Unitil,
16 that serve more than one service area or region. It does not address the utilities’
17 more comprehensive “restoration strategy,” and thus does not describe how
18 resources and repairs are prioritized by the utility within its service areas.
19

20 **Q. Can you offer clarification of Unitil’s response to Staff data request 1-47?**

21 A. Staff 1-47 asked about the process used to assign and deploy resources across
22 state lines for handling simultaneous outages. The phrasing of the sentence “[t]he
23 company's goal is to accomplish full restoration to all customers at approximately
24 the same time” appears to have led to confusion over the Company’s objectives
25 and philosophy regarding service restoration, and appears to have been taken out

1 of context and interpreted in a manner never intended. The sentence should be
2 interpreted to mean that the Company's goal is to accomplish full restoration to
3 all customers as soon as possible under the circumstances. The strategy for
4 accomplishing this, as was more fully described in the Company's data response,
5 is that resource allocation decisions were based on the results of damage
6 assessment and estimates of when restoration would be completed. In essence,
7 resources were being matched to the amount and type of repairs required and
8 crews were being assigned to where they were most needed. This is standard
9 utility practice, and represents a valid quantitative methodology to match
10 resources to needs.

11
12 **Q. Do you have any other insights as to how NEI then drew its conclusions**
13 **regarding the adequacy of Unitil's restoration strategy?**

14 A. Yes. The conclusions in the NEI Report reflect an apparent
15 misunderstanding in which two separate and distinct issues have been
16 confused. The two issues of interest are:

- 17 1. Prioritization of restoration *within* a service territory or work area; and
- 18 2. Resource allocations *among* service territories or work areas.

19
20 There appears to be a lack of clarity and understanding as to the distinction
21 between resource allocation decisions among service areas, and how those
22 decisions are made, and the restoration strategy that determines how those
23 resources are deployed within a service area, and how those decisions are made.

1

2 **Q. Please explain why you believe NEI's conclusions regarding the adequacy of**
3 **Unitil's restoration strategy are inaccurate.**

4 A. Much of the discussion on pages II-48 and II-49 of the NEI Report relates to the
5 prioritization of outages within Unitil's New Hampshire service areas. NEI
6 repeatedly references graphs of field crews and customers without power, for
7 New Hampshire only, and from those graphs proffers insights based on the shape
8 of the curve presuming that Unitil's restoration strategy was to attempt to get all
9 customers restored at the same time. For example, NEI states in its report that "If
10 all customers were indeed restored at the same time the graph would be horizontal
11 until the final day at which point it would be vertical" [*NEI Report at II-49*]. This
12 reflects NEI's attempt to rationalize customer restoration under the mistaken
13 belief that Unitil was attempting to restore all its customers at the same time.

14

15 NEI next states that "a philosophy of restoring the largest number of customers as
16 quickly as possible would make the customer graphs in Figure II-11 steeper and
17 more exponential, and Unitil's philosophy of restoring all customers at once
18 would make this graph less steep and more horizontal. The fact that all of the
19 customer graphs *including Unitil's* [emphasis added] show a relatively steep
20 exponential shape indicates that the philosophy of Unitil is impractical to achieve
21 and probably an inappropriate goal" [*NEI Report at II-49*]. This interpretation of
22 the data reflects NEI's continued confusion over the restoration philosophy at

1 Unitil, yet confirms that Unitil was restoring service to as many customers as
2 possible as rapidly as possible in a manner identical to the other utilities.

3

4 **Q. Please continue.**

5 A. In the next section, NEI further states “the de-facto result of the restoration efforts
6 by all the utilities in this storm is that many customers were restored at the
7 beginning of the effort. Customers receiving more damage or who were more
8 remote and difficult to reach waited longer, which is why the customer curves in
9 the graphs flatten out at the ends. It is clear from the graphs that Unitil’s
10 philosophy of trying to restore all customers at the same time *was not carried*
11 *through* [emphasis added] even though they may have tried” [NEI Report at II-
12 49]. Again, even though the NEI graphs confirm that Unitil was restoring service
13 to as many customers as possible as quickly as possible in a manner identical to
14 the other utilities, NEI incorrectly concludes that Company was, at least initially,
15 attempting to accomplish something different.

16

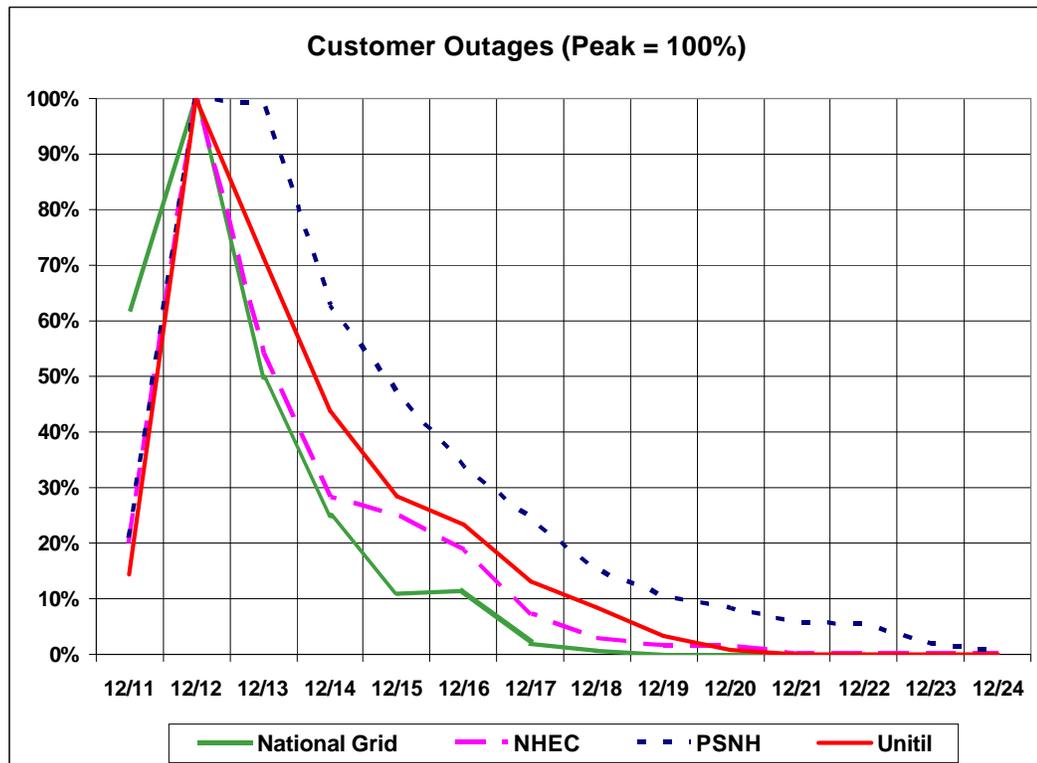
17 **Q. Does Unitil have a different interpretation of the customer graphs in the NEI**
18 **Report?**

19 A. Using the same customer outage data from the NEI Report, and combining the
20 data from all the utilities onto a single graph, it is possible to directly compare the
21 rate of customer restoration of all the utilities. As shown in Figure 1, the rate at
22 which customers were restored was remarkably consistent across the New
23 Hampshire utilities. Differences between utilities were due to a variety of utility-

1 specific factors, including the nature and extent of damage, where the damage
2 occurred on the utility system (transmission vs. distribution, etc.), how quickly
3 crews were able to access damaged areas, the number of crews deployed, and
4 many other factors. The only logical conclusion to be drawn from the data in the
5 NEI Report was that Unitil's restoration strategy was identical to the other
6 utilities, and yielded results similar to the other utilities.

7

Figure 1



8

9

10 **Q. Did NEI offer any other conclusions relative to restoration strategy in its**
11 **report?**

1 A. After extensive discussion about Unitil’s restoration strategy in New Hampshire,
2 NEI then shifted to a different issue: allocation of resources between Unitil’s New
3 Hampshire and Massachusetts territories relative to the number of customers
4 without power. Here NEI stated that Unitil’s Massachusetts territory received
5 what appears to be an “inordinate” number of crews relative to the number of
6 customers without power [*NEI Report at II-49*]. This broad generalization appears
7 without any substantiation. Substantiation would have required a more in-depth
8 assessment of the factors contributing to crew allocations. NEI concluded that
9 since the damage in Massachusetts was known to be more severe it would be
10 expected that restoration efforts would be more effective and more of Unitil’s
11 customers would be restored at a faster rate by assigning resources to the New
12 Hampshire area first, even though this would certainly have delayed restoring the
13 customers in Massachusetts. There is no basis for this conclusion.

14
15 NEI did not provide any insight as to the *appropriate* number of crews to be
16 allocated between service territories. Nor does the strategy of “restoring service to
17 the largest number of customers as rapidly as possible” provide a methodology for
18 making such decisions. Restoring service to the largest number of customers as
19 rapidly as possible relates to the *order* in which individual troubles (outages) are
20 assigned. In other words, it is a prioritization decision related to which *outages*
21 are more important, and which outage should be assigned next. It does not
22 provide a methodology for determining how many or which type of resources are

1 needed, or how resources should be optimally allocated between areas of differing
2 characteristics.

3

4 **Q. Do you agree with NEI's recommendation that resources should be allocated**
5 **based on the number of customers experiencing outages?**

6 A. No. The number of customers experiencing outages is but one measure of a
7 storm's magnitude and resulting damage. In fact, it has less relevance as a
8 decision-making guideline than other measures because it may provide little or no
9 correlation to the amount and type of damage, and the number and type of
10 resources required. It is both conceivable and typical that a utility could
11 experience an outage to thousands of customers due to a single problem
12 ("trouble") on its system (e.g., a whole circuit or subtransmission outage). It is
13 equally conceivable that the same number of customers could be interrupted due
14 to hundreds of individual problems, each requiring extensive repairs. In the
15 former case a single crew could be dispatched to restore service to thousands of
16 customers, whereas in the latter case dozens or hundreds of crews may be needed
17 to restore service.

18

19 Clearly, the goal is to assign the *appropriate* number and type of resources needed
20 to restore service. Assigning resources solely on the basis of the number of
21 customers without power may result in a disproportionate number of resources
22 relative to the amount and type of repairs required, which would in turn reduce

1 the efficiency of the restoration effort and ultimately delay restoration to all
2 customers.

3

4 **Q. How should the appropriate level of resources be determined?**

5 A. A more meaningful measure would be to estimate and allocate resources based on
6 the number of “trouble locations” that need to be dispatched, recognizing that one
7 outage generally does not equate to one customer. This is typical during smaller
8 storm events (e.g., thunderstorms) where damage is light and repair times are
9 relatively short and predictable. However, this metric proves insufficient during
10 major storm events and natural disasters when damage is extensive. During the
11 December 2008 ice storm it was not possible to discern individual trouble
12 locations because large portions of the system were extensively damaged.
13 Furthermore, repair times were extremely lengthy and varied widely from
14 location to location depending on the nature of the damage.

15

16 During extreme events such as the December 2008 ice storm, when damage is
17 extensive and repair times lengthy, resource allocation decisions are best made on
18 the basis of damage assessment and estimated repair times. Allocating crews on
19 the basis of damage assessment also ensures the most efficient deployment of
20 resources, ultimately resulting in the shortest overall restoration. As discussed in
21 the next section, there are many other factors that also contribute to resource
22 allocation decisions.

23

1

2

3

III. DEPLOYMENT OF CREWS

4 **Q. Please describe the decision-making process employed by Unitil to allocate**
5 **crews among its three service areas throughout the restoration effort.**

6 A. The decisions to assign crews among the three Unitil service areas were made by
7 the Director of Operations (Ray Letourneau) in consultation with the COO (Tom
8 Meissner) based on information provided by the restoration managers in each of
9 the three areas (i.e. Capital Region, Seacoast Region and Fitchburg). There were
10 many factors that contributed to these decisions including:

- 11 • public safety requirements
- 12 • the number of crews available from mutual aid entities;
- 13 • travel time from home locations;
- 14 • estimates of the amount of damage to be repaired in each division;
- 15 • estimates of the type of damage to be repaired;
- 16 • the types of crews available;
- 17 • the prospect of anticipated new crews and crew types;
- 18 • the estimated time to restore power to all customers in each division;
- 19 • the number of customers without service; and
- 20 • the logistical support for crews.

21

22 **Q. Please describe some of the complicating factors experienced during the early**
23 **hours of the restoration effort.**

24 A. The Unitil system began to experience outages in the late night hours of
25 December 11th and into the early morning hours of December 12th. During the
26 overnight hours, very limited information was available as to the extent of
27 damage on the distribution system because large portions of the system were

1 interrupted due to transmission and subtransmission problems. In New
2 Hampshire, thousands of UES customers were interrupted due to outages on 34.5
3 kV subtransmission lines. In Massachusetts, 100% of Fitchburg's customers were
4 interrupted due to the loss of the external 115 kV transmission lines feeding our
5 major substation. As damage assessment was completed in the days that followed,
6 we learned that much of the damage to the distribution system occurred as ice
7 laden trees fell on a system that was already de-energized. In many cases, fuses
8 and other devices did not operate because the entire circuit or system had already
9 been interrupted prior to subsequent damage from falling trees.

10
11 Because crews were already staged at each region, they were immediately
12 deployed to service restoration activities. The lack of daylight prevented crews
13 from obtaining a visual assessment of the damage, except for the specific trouble
14 locations assigned to them by the restoration coordinator. Working conditions
15 were both difficult and dangerous due to falling ice, trees and other debris and due
16 to road closures. Our early assessment of the magnitude of the event was largely
17 formed by an assessment of other factors including breaker lockouts reported by
18 SCADA, analysis of trouble tickets and corresponding customer counts, and
19 reports from field crews, supervisors, and other employees as they focused on
20 service restoration or were travelling to their designated work location.

21
22 **Q. What information was available during the overnight hours of December 11th**
23 **to December 12th?**

1 A. As already stated, the entire Fitchburg system was out of service during the early
2 morning hours of December 12th, and efforts were underway to restore the
3 internal transmission system as external 115 kV transmission lines were restored.
4 Preliminary field reports in Massachusetts suggested a significant number of
5 broken poles, providing an early indication that the ice loading on trees was
6 significant and resulting damage extensive. The overnight data that was available
7 indicated that we did not initially have as many customers without service in New
8 Hampshire, and the number of broken poles being reported was significantly less
9 than reports from Massachusetts, suggesting the level of system damage was
10 likely less than that experienced in the Fitchburg area. In addition, whereas
11 weather reports had predicted the potential for a significant icing in the Fitchburg
12 area, temperatures in the UES Seacoast territory were expected to rise above
13 freezing during the overnight hours and icing was predicted to be less of a
14 concern.

15
16 As daybreak arrived on December 12th, UES' Seacoast territory began reporting
17 tens of thousands of customers without power, primarily due to outages of 34.5
18 kV subtransmission lines. All efforts were focused on restoring the
19 subtransmission system, through either switching or repairs, to restore power to
20 substations and circuits. UES' Capital territory continued to report fewer
21 problems and experienced a lower percentage of customers without power than in
22 the Seacoast or Fitchburg service areas, or about 6,000 customers without power.

23

1 **Q. How were resources allocated at the beginning of the restoration effort?**

2 A. Prior to the storm, Unitil had six bucket crews in Massachusetts and nineteen
3 bucket crews in New Hampshire, including outside contractors. As a result of the
4 initial reports, during the overnight hours we contacted one of our contractors and
5 requested that six crews that had been working on the Seacoast system on
6 December 11th be sent to Fitchburg on the morning of December 12th. The
7 contractor was further asked to transport off-road equipment to Fitchburg in order
8 for the crews to begin work on the transmission system. This allocation was
9 based on the information we had at the time regarding system damage, the type of
10 damage, and the number of resources on the system.

11

12 Of the six bucket crews sent to Fitchburg, three were replaced later the same day
13 by the same contractor and dispatched to the UES Seacoast territory. One
14 additional bucket crew was obtained from the same contractor on December 13th
15 and another on December 15th.

16

17 **Q. Were efforts made to recruit additional resources?**

18 A. Yes. Unitil participated in an initial conference call of the Northeast Mutual Aid
19 Group (NEMAG)¹ on December 11th. A second call was scheduled for 6:00 a.m.

¹ NEMAG was formed in 2007 by a group of New England and Canadian electric utilities to facilitate the ability of its members to aid one another to respond to emergencies. NEMAG filled a needed gap in emergency preparedness because there was no regional emergency coordinator or agency with responsibility for allocating resources among electric utilities in this region. The first priority of every NEMAG member is to restore service to its own customers before releasing crews to other utilities. Prior to the formation of NEMAG, any utility seeking aid would have to rely on contacts with their operations counterparts at neighboring utilities. The purpose of NEMAG was to supplement this cooperation with a

1 on December 12th when utilities were expected to have a preliminary assessment
2 of the impact of the storm. Unitil participated in calls at 6:00 a.m. and 12:00 noon
3 on December 12th when the utilities agreed on how to allocate available resources
4 between participants. The process of allocating mutual aid was essentially
5 concluded with the noon call on December 12th, and no further calls were
6 scheduled, although Unitil's efforts to secure more crews continued until power
7 was restored to all customers. Unitil obtained commitments for 40 crews and
8 expected those crews to arrive on December 13th. It is worth noting that the term
9 "crew" does not always refer to the same type of resources, and can have different
10 meanings in the context of mutual aid and contractors.

11

12 As more information regarding the extent of damage to its three service areas
13 became available on December 12th, Unitil called contractors and continued
14 searching for crews through all available means. However, given the very broad
15 impact of the storm across the northeast, virtually all crews in the region were
16 already committed to utilities, and mutual aid from outside the region had been
17 committed through the mutual aid process that occurred on December 12th.

18

19 **Q. What are the different types of crews used in restoration and does the type of**
20 **damage to be repaired influence the allocation of crews among service areas?**

formal process to facilitate a coordinated system-wide response to regional emergency situations that impact all utilities in the Northeastern United States and Canada.

1 A. There are four distinct crew types: (1) bucket crews that repair electrical
2 equipment; (2) digger crews that replace damaged and downed poles; (3) tree
3 crews that clear vegetation in advance of bucket crews; and (4) off- road crews
4 that utilize equipment designed to be operated over rough terrain often found in
5 the company's subtransmission and distribution rights-of-way. In allocating
6 crews among service areas, the type of damage determines the mix of crew types
7 necessary to restore power. For example, Unitil's Fitchburg service area had a
8 dire need for digger crews due to the extraordinary number of poles that needed to
9 be replaced.

10

11 In the context of mutual aid, many contractors also assemble crews into
12 complements referred to as "construction crews," where each crew consists of
13 multiple vehicles, each with a full complement of manpower. For example, a
14 typical construction crew may consist of two bucket trucks and one digger truck
15 with qualified workers and supervision. Unitil normally counts a "crew" as two
16 qualified workers with a truck. Thus, a typical construction crew might actually
17 be counted as three crews if each truck and its workers were counted separately.
18 Many of the crews committed to Unitil through the mutual aid process were
19 construction crews consisting of two buckets and a digger per crew, each with
20 qualified personnel.

21

22 **Q. Are there any other factors that affected the number of crews available to**
23 **Unitil during the first few days of the restoration period?**

1 A. Unitil suffered a major setback when informed late in the day on December 12th
2 that 14 contractor crews pledged to Unitil during the 12:00 PM NEMAG
3 conference call would not be coming from Ohio because they were not able to
4 secure the necessary resources to man the trucks. These crews had been expected
5 to arrive on December 13th. The consequences were particularly significant as
6 these crews were configured as construction crews and represented a much larger
7 resource contingent than 14 trucks. Each crew was comprised of two bucket
8 trucks, a digger truck, and a general foreman in a pickup truck. In total, this would
9 have provided Unitil with 42 additional crews (28 bucket trucks and 14 digger
10 trucks). The loss of these crews “cost” Unitil 420 crew days (assuming these
11 crews would have stayed for 10 days), out of the total 1,915 crew days ultimately
12 required to restore service to all Unitil customers in both states.

13

14 After continuing efforts to procure additional crews, Unitil was ultimately able to
15 secure 13 construction crews from Tennessee, configured with nearly identical
16 crews complements. The 13 construction crews from Tennessee represented 39
17 individual crews, and were due to arrive in New Hampshire on December 15th.
18 Unfortunately, these crews experienced travel delays due to traffic and weather
19 while en-route, and did not arrive in New Hampshire until December 16th. This
20 setback delayed the arrival of resources an additional day.

21

1 Each of these circumstances affected the number of crews working to restore
2 power in both New Hampshire and Massachusetts beginning on December 13th, a
3 day following the ice storm.
4

5 **Q. Please describe how the number of crews from mutual aid entities and travel**
6 **time from home locations contributes to allocation decisions.**

7 A. A greater number of crews from entities that are located within a day's travel
8 from Unitil's service areas provides flexibility to the restoration leader (now
9 called the "incident commander" in the updated ERP). As the storm progresses,
10 the ability to continue to attract crews takes some of the pressure off of allocation
11 decisions as an adequate complement of crews can be assigned to each division.
12 To the extent that crews require more than a day to travel, they may be allocated
13 on a given day, with consideration to where new crews will be staged on the
14 following day or two. Crews may also be relocated in anticipation of a later
15 arrival of crews to serve in a backfill and supplement capacity.
16

17 **Q. Please describe how damage estimates contributed to the allocation decisions**
18 **made in the early stages of the restoration effort.**

19 A. As described in Section II, damage estimates are a primary driver in crew
20 allocation decisions. However, during the early stages of the restoration effort our
21 ability to perform damage assessment was hindered by multiple factors, including
22 the lack of daylight, roadway obstructions restricting access to our facilities, and

1 the fact that falling trees and tree branches posed a significant safety threat to
2 crews deployed in the field.

3

4 This quality of damage information improved with each day of the restoration
5 effort. As roadways were cleared of debris and travel conditions improved, we
6 were able to perform partial damage assessment. However, ice-laden branches
7 and trees continued to fall into our electric facilities well into the first weekend of
8 the event, December 13th and 14th, further eroding the quality of damage
9 estimates. In short, the situation was dynamic. As the damage stabilized after
10 December 14th, and as preliminary damage reports were compiled, Unitil had
11 much better information to support crew allocation decisions.

12

13 **Q. Were the resulting crew allocations questioned in either the NEI or NHPUC**
14 **reports?**

15 A. Yes. The NEI Report characterized Unitil's restoration strategy as
16 "inappropriate" because crews were assigned based on the amount of damage
17 incurred rather than the number of customers without power. NEI further stated
18 that "Unitil's restoration effort was "adversely impacted because the system area
19 with the most damage rather than the most customers was assigned the greatest
20 amount of resources." [*NEI Report at II-49*].

21

22 The NHPUC Report drills down further and questions Unitil's allocation of crews
23 during the first few days of the restoration period in three respects. First, the

1 NHPUC Report asserts that more crews should have been dispatched to the New
2 Hampshire service areas during the first three days because the number of
3 customers without power was higher in New Hampshire than Massachusetts
4 during this time. Second, the NHPUC Report compares the ratio of crews per
5 customers without power to observe that UES had fewer crews per customers
6 without power than other New Hampshire electric utilities from December 12
7 through December 15. Third, the NHPUC Report indicates that that the number
8 of Outside Bucket Crews (aka contractor line crews) decreased between
9 December 11 and December 15. [*NHPUC Report at 31*].

10

11 **Q. Have you addressed the first issue raised in the NHPUC report?**

12 A. Yes. As discussed earlier in this testimony, allocating crews based on the number
13 of customers experiencing outages is not a sound methodology because fails to
14 match the appropriate number and type of resources to the applicable amount and
15 type of damage to be repaired. It is more appropriate to allocate resources on the
16 basis of damage assessment, matching the number of resources to the scope of
17 repairs.

18

19 **Q. With regard to the second issue raised in the NHPUC Report, please**
20 **comment on data indicating that UES had the lowest ratio of crews per**
21 **number of customers without power for four days.**

22 A. The NHPUC Report provided data showing that Unitil had the lowest ratio for
23 crews per number of customers without power among the New Hampshire

1 electric utilities during the 4 days between December 12th and December 15th. It is
2 worth noting that if Unitil had the lowest ratio for four days of the 14-day
3 restoration period, then clearly other utilities had lower ratios of crews on the
4 other 10 days. Nonetheless, accepting that Unitil did have a lower ratio at the
5 outset of the storm, simple inspection of the data on Page 32 of the NHPUC
6 Report suggests that this ratio was only materially different on two such days:
7 December 12th and December 13th.

8
9 December 12th, as already discussed, was the first day of the restoration effort.
10 Information was limited or non-existent, little damage assessment had been
11 performed, field conditions were difficult and at times treacherous, resources were
12 focused primarily on restoring the subtransmission system, and significant efforts
13 were being made to recruit more crews. The extent to which additional crews
14 could have been efficiently deployed to distribution restoration activities on
15 December 12th is questionable. On December 13th, Unitil was expecting crews
16 obtained through mutual aid to begin arriving, but experienced the loss of a major
17 contingent from Ohio, as already discussed. As a result, resources were limited
18 until additional crews arrived from Tennessee.

19

20 **Q. What was Unitil's experience restoring power during the four days between**
21 **December 12 and December 15?**

22 A. According to data provided in both the NEI Report (Table II-2) and the NHPUC
23 Report (Page 30), 37,800 UES customers were without power on December 12th.

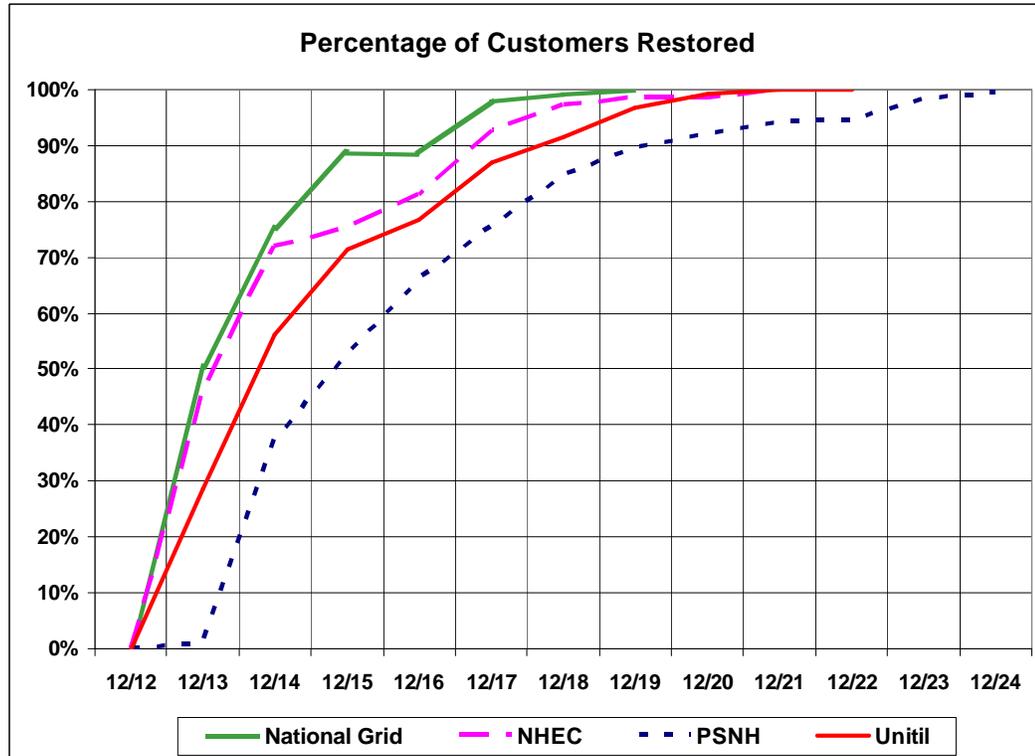
1 By December 13th, this had fallen to 27,000 customers without power, indicating
2 that roughly 29% of customers had been restored in the first 24 hours of
3 restoration. By December 14th the number of customers without power had fallen
4 further to 16,584, indicating that 56% of customers had been restored over the
5 first two days of restoration. By December 15th, Unitil had restored service to over
6 70% of the customers who lost power on December 12th, as the total number of
7 customers without power dropped to 10,754.

8
9 As evident in Figure 2 below, the pace of UES' restoration during the four days
10 between December 12 and December 15 progressed rapidly and was generally in
11 line with other utilities, despite the loss of a significant number of crews expected
12 through the mutual aid process. This confirms that UES was successful in its
13 efforts to restore the internal 34.5 kV subtransmission system, and in doing so,
14 restored service to substations and circuits feeding thousands of customers. The
15 large contingent of crews from Tennessee, after being delayed during travel,
16 arrived at about the time that restoration began to slow considerably due to
17 increasingly time consuming distribution repairs for fewer and fewer numbers of
18 customers.

19

1

Figure 2



2

3

4 **Q. Is the ratio of crews per number of customers a good metric?**

5 A. No. As discussed earlier in this testimony, allocating crews based on the number
6 of customers experiencing outages is not a sound methodology. For similar
7 reasons, the number of crews per customers without power has little relevance as
8 an evaluative metric because there is little correlation to the amount and type of
9 damage and the efforts required to restore power. As evidenced by the data, this
10 ratio is sensitive not only to the number of crews, but also to the speed at which
11 customers are restored, which in turn varies widely based on a myriad of factors
12 including the extent of damage. The data in both the NEI Report and the NHPUC
13 Report shows the UES ratio of “customers without power for each field crew

1 deployed” declining from 1,890 on Friday December 12th to 425 on Monday
2 December 14th, despite there being no commensurate change in the number of
3 crews. Essentially, UES’ ratio was brought in line with the other utilities not by
4 acquiring more crews, but by restoring more customers faster, relative to the total
5 number of crews working.

6
7 The NEI Report itself noted that Unitil “had a relatively high restoration rate of 57
8 customers restored per crew-day,” which was higher than the other utilities, but
9 then went on to suggest that the “high restoration rate *may be due* [emphasis
10 added] to Unitil’s service area being more densely populated than that of the other
11 utilities.” [NEI Report, page II-9]. Clearly this is an opinion not supported by
12 facts, and represents another NEI conclusion formed without exploring the
13 underlying restoration activities in order to reach valid and substantiated findings.
14 The ratio of customers without power per crew deployed declined rapidly
15 throughout the restoration period due to both effective deployment and restoration
16 strategies, and due to the addition of resources as they became available.

17

18 **Q. With regard to the third issue raised in the NHPUC Report, did crews leave**
19 **UES’ service territory during the initial phase of the restoration plan?**

20 A. According to both the NHPUC Report and the Order of Notice “[d]ata showed
21 that the number of outside contractor line crews deployed in New Hampshire
22 decreased during and immediately after the ice storm, indicating that contractor
23 line crews were leaving UES’ service territory during the initial phase of the

1 restoration plan.” This statement suggests an on-going reallocation of resources
2 in which crews were leaving New Hampshire and heading to Massachusetts for
3 some period of time during and immediately after the ice storm.

4
5 As noted earlier, Unitil adjusted its crew assignments among its three service
6 areas during the early morning hours of December 12th in response to preliminary
7 reports of damages. Thus, six crews from a single contractor that had worked in
8 New Hampshire were asked to report to Fitchburg on December 12th as Fitchburg
9 only had six of its own crews working to restore power to a system experiencing a
10 complete blackout. There were no subsequent decisions to shift resources out of
11 New Hampshire until restoration activities in New Hampshire were complete.
12 The same contractor replaced three of these crews later on the same day and was
13 able to provide a fourth crew on the following day (December 13) and a fifth crew
14 on December 15. The impact on restoration of service to New Hampshire
15 customers was minimal

16

17 **IV. RESOURCE PROCUREMENT AND ALLOCATION**

18 **Q. Has Unitil changed its emergency plan to address any of the issues explored**
19 **in this docket?**

20 A. Yes. Unitil has extensively revised its Emergency Restoration Plan (ERP) and
21 modeled the new plan on the Incident Command System (ICS). The new ICS-
22 based plan includes a trained group whose primary purpose is to assess damage

1 and determine resource requirements (Planning Section), and a separate group
2 whose primary purpose is to acquire and support those resources (Logistics
3 Section). The managers responsible for these activities, referred to as Section
4 Chiefs, report to an Incident Commander who will ensure that the new processes
5 and preplanning activities reflect the stated protocol for resource acquisition and
6 allocation. The restoration objectives, number and type of resources required,
7 resources deployed, estimated time of restoration and operational plans for the
8 next operational period are developed into an Incident Action Plan (IAP).

9

10 **Q. How does this specifically address the issues pertaining to acquisition and**
11 **deployment of resources?**

12 A. The Company has greatly expanded its list of contractors and utilities to include
13 73 contractors and 51 utilities. These contacts are maintained and updated on an
14 on-going basis, and are annually contacted during drills to ensure that we have the
15 best contact information. Our goal is to ensure that we are able to procure
16 adequate resources for all our regions should we experience an event of similar or
17 greater magnitude.

18

19 The job of maintaining procedures, contracts, and contact information falls to the
20 Logistics Section. This group's sole mission is to acquire and logistically support
21 external resources prior to and during an event. During a major event, there is
22 now a trained staff of people whose job is to contact contractors and utilities to

1 obtain the resources identified by the Planning Section, and specified in the
2 Incident Action Plan.

3

4 **Q. Has Unitil taken other steps to improve its ability to acquire additional**
5 **resources?**

6 A. Yes. In addition to relationships and contacts with contractors and utilities, we
7 have established contracts with several major vendors for on-call and stand-by
8 services for line crews. The Company has also adopted a philosophy of pre-
9 staging resources when forecasted or actual observations predict severe weather
10 with high likelihood of damage to the utility system. This allows us to lock up
11 resources at the outset of a major event, before the mutual aid process begins.
12 Unitil also joined the EEI RestorePower service which provides access to
13 information about utilities, contractors and vendors, and facilitates coordination of
14 restoration requests and needs. Finally, Unitil continues to be an active participant
15 in the Northeast Mutual Assistance Group (NEMAG), and will avail itself of the
16 Northeast region and Multi-region mutual aid process if needed. This expanded
17 list of resources, coupled with a proactive planning and acquisition strategy, will
18 ensure that appropriate resources are available earlier in the restoration.

19

20 **Q. Please describe in detail how crews will be allocated between regions when**
21 **simultaneous large-scale events occur in multiple states and jurisdictions.**

22 A. There are several iterations to this process, beginning with the decision to pre-
23 stage resources in advance of a major event. As already described, the Company

1 has adopted a philosophy of pre-staging resources when weather forecasts predict
2 damaging weather in order to lock up resources at the outset of a major event. In
3 doing so, the Company may make use of “on call” arrangements, which commit
4 contractor crews to Unitil for a specified period of time. Resources may also be
5 physically deployed in the field based on an assessment of where damage is likely
6 to occur. A portion of available resources may also be held in reserve and
7 allocated to the regions based on where the most damage and greatest number of
8 trouble locations occur.

9

10 The initial allocation of resources between regions is typically based on very
11 preliminary information and occurs in concert with the Public Safety phase of
12 restoration within each region. Depending on the nature and severity of the event,
13 additional resources may be pursued immediately, even in advance of more
14 formal damage assessment. The process of pre-staging based on weather forecast
15 coupled with resource allocation based on actual damage is the most efficient way
16 to address the initial response requirements.

17

18 **Q. How will resources be allocated “after” a catastrophic weather event has**
19 **impacted Unitil’s territories in multiple states and jurisdictions?**

20 A. Assuming widespread damage occurs in multiple territories, trained damage
21 assessment personnel will be deployed immediately to each area to complete a
22 preliminary damage assessment. The goal is to complete this preliminary damage
23 assessment as quickly as possible, but within the first 24 hours. The purpose of

1 this initial damage assessment is to estimate the time to fully restore service in
2 each area, given available resources. Based on the initial Estimated Time of
3 Restoration (ETR) for each territory, adjustments may be made to the resource
4 allocations among areas, additional resources may be recruited, or both. The
5 restoration strategy and overall incident objectives will be established in concert
6 with the Company's Strategic Response Committee and the Incident Commander.
7 Deployment of resources will be adjusted as necessary to align the regional ETRs
8 with the incident objectives. This is an iterative process.

9

10 **Q. Will further adjustments be made to resources as restoration progresses?**

11 A. Yes. Immediately following the preliminary damage assessment and the
12 development of what is referred to as the Global ETR, damage assessment
13 personnel will begin a more detailed damage assessment, a process that can last
14 up to 72 hours. Between the time of the preliminary damage assessment and the
15 more detailed damage assessment, the Incident Command staff will evaluate the
16 data for any gaps in skills required, and will acquire or move resources as needed.

17

18 The last part of the process is to review the more detailed damage assessment.
19 From this information, the Incident Command staff will refine the resource
20 requirements. There are many factors to be considered when making these
21 decisions including; resource availability, travel time and logistics, to name but a
22 few. However, the objective in all cases is to ensure the Company meets or beats
23 its stated Estimate Time of Restoration (ETR).

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V. CONCLUSION

Q. Please summarize your testimony.

A. Unitil appreciates the sensitivity of the crew deployment issues that have been raised by the Commission. Unitil also appreciates the opportunity to clarify these matters for the benefit of all stakeholders, including our customers in New Hampshire. However, as demonstrated herein, Unitil applied reasonable and appropriate strategies to restore power both with respect to the allocation of crews among the three geographically separated service areas and the prioritization of the work effort within each area to restore the maximum number of customers in the shortest amount of time. Unitil’s approach to crew deployment is consistent with that of the other utilities and is typical within the industry. Furthermore, the pace of customer restoration in Unitil’s New Hampshire territories was comparable to the other utilities.

Unitil has also taken several steps to improve its ability to attract crews should an event of similar or greater magnitude affect its customers. These steps include:

- Implementing a new ICS-based Emergency Restoration Plan with groups assigned to both assess damage and determine resource requirements, and to acquire and support those resources;
- Greatly expanding the pool of available resources to include 73 contractors and 51 utilities;
- Establishing agreements with several major contractors to provide standby and on-call emergency services;

- 1 • Adopting a philosophy of pre-staging resources when weather
2 forecasts predict severe weather with high likelihood of damage to the
3 utility system.
- 4
- 5 • Joining EEI's Restore Power service, an online tool that provides
6 access to information about utilities, contractors and vendors, and
7 facilitates coordination of restoration requests and needs; and
8
- 9 • Continuing to work with fellow NEMAG members to improve the
10 processes by which crews are obtained.
- 11
- 12

13 **Q. Does this conclude your prepared testimony?**

14 **A. Yes.**

**NHPUC December 2008 Ice Storm Review
Unitil Energy Systems, Inc.- Set 1**

**Witness: Raymond A. Letourneau, Jr.
February 27, 2009**

Staff 1-47:

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

Response:

During the 2008 Ice Storm, as the damage assessment estimates were completed, the Restoration Coordinator began to form full restoration estimates; that is, the approximate date and time when electric service to all customers would be restored. This estimate was based upon the amount of repair work required and the total number of resources available. Since multiple locations were engaged in restoration during the 2008 Ice Storm, resources were allocated based upon these restoration estimates.

The company's goal is to accomplish full restoration to all customers at approximately the same time. Therefore, the operating center that has the most amount of damage is assigned the greatest amount of resources. If any operating center completes restoration while others are still engaged, those resources are assigned to the other location.

This process is utilized throughout the entire restoration period. Full restoration estimates are reviewed frequently, and resources are reallocated should conditions warrant. This ensures that all locations receive maximum resources required to achieve the company's objective.