

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS**  
**DIVISION OF PUBLIC UTILITIES AND CARRIERS**

IN RE: REVIEW OF PREPAREDNESS AND RESTORATION :  
EFFORTS BY THE STATE'S ELECTRIC UTILITY :  
COMPANIES RELATED TO THE RECENT DAMAGES : DOCKET NO. D-11-94  
SUSTAINED FROM TROPICAL STORM IRENE :

**REPORT AND ORDER**

**1. Introduction**

On September 26, 2011, the Rhode Island Division of Public Utilities and Carriers ("Division") published a notice in the Providence Journal informing the public that the Division was conducting a regulatory review of the preparedness and restoration efforts by the State's mainland electric utilities related to damages Rhode Island sustained from Tropical Storm Irene on August 28, 2011. The Division announced that it was undertaking the review in accordance with regulatory authority conferred under Sections 39-4-10, 39-4-11 and 39-4-13 of the Rhode Island General Laws.

In its notice, the Division explained that the initial phase of its review would be to provide a forum to afford all interested electric customers and local governmental officials an opportunity to offer public comment on the issues of National Grid's storm-season preparedness and post-storm efforts to restore electric services to those customers who lost service. In furtherance of this outreach effort, the Division conducted four (4) evening (7:00 p.m.) public comment sessions: on October 5, 2011, inside the Council Chambers at the

South Kingstown Town Hall; on October 6, 2011 at the Division's Hearing Room in Warwick; on October 12, 2011, inside the Council Chambers at the Pawtucket City Hall; and on October 13, 2011, inside the Council Chambers at the Middletown Town Hall.

The September 26, 2011 notice also contained the following explanation for the Division's review and the procedural path that the Division planned to adhere to in this docket:

*As with any significant disruption in electric service, the purpose of this review is to fully understand the reasons for the scope and duration of the outages; and to apply any and all lessons learned to future emergencies. In addition to public comment sessions, the Division will also be questioning the State's mainland electric utilities for information related to their pre-storm and post-storm activities. At the conclusion of this process a formal evidentiary hearing will be held before a Division hearing officer who will review the record and issue findings and recommendations to the Division's Administrator.*

In addition to conducting public comment sessions, the Division also retained an engineering consultant in October 2011, Power Services and Consulting, Inc., 1616 East Millbrook Road, Suite 210, Raleigh, North Carolina ("PowerServices") to evaluate the preparedness of National Grid to deal with the outages and damage associated with Tropical Storm Irene and the effectiveness of the efforts of National Grid to restore power to its Rhode Island customers. PowerServices' engineers and management staff have extensive utility experience, including leading storm restoration responses to over 25 east coast hurricanes. The lead engineer on this consulting project was Mr. Gregory L. Booth PE, PLS.

The Division specifically asked PowerServices to make recommendations for improvements, as may be needed, to National Grid's preparedness and storm response.

In furtherance of its task, PowerServices' team performed a multi-tiered fact-finding analysis, which included: obtaining information from other utilities that were affected by either Hurricane Irene or Tropical Storm Irene; researching available data, including National Weather Service reports related to the storm as it progressed up the eastern United States; comparing the statistical performance of National Grid to other utilities affected by the storm, including wind speeds, customer outages, restoration time, and overall impact to other utility systems; and reviewing both public information available on National Grid and information derived from a series of data requests served on National Grid. Power Services also requested interviews with certain levels of management, engineering, and responders to the storm in order to achieve a comprehensive understanding of all the related issues of National Grid's storm response; however, this request was declined by National Grid.

PowerServices completed its review and submitted its findings and recommendations to the Division on March 5, 2012 (the "PowerServices Report" or "Report" or "Booth Report"). National Grid was also provided with a copy of the Report. PowerServices declares that its recommendations are intended to enhance future system resilience, storm preparedness, and restoration response, infra.

The Narragansett Electric Company, d/b/a National Grid (“National Grid” or “Company”) subsequently proffered its response and comments to the PowerServices Report through two submittals filed with the Division on April 19, and August 14, 2012, infra.

## **2. Pre-hearing Conference**

On June 21, 2012, the Division conducted a pre-hearing conference in this docket to determine whether any additional discovery or any outstanding procedural issues remained that required attention prior to the undersigned hearing officer’s review of the record and recommendations to the Administrator.

The following counsel entered appearances:

For the Division’s Advocacy  
Section<sup>1</sup>:

Leo J. Wold, Esq.  
Assistant Attorney General

For National Grid:

Jennifer Brooks Hutchinson, Esq., and  
Thomas R. Teehan, Esq.

At the pre-hearing conference, the parties jointly advised that a hearing would not be required as both parties preferred to rely exclusively on their document submissions in this docket. Specifically, the Advocacy Section related

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<sup>1</sup> The Division routinely bifurcates its staff into “advocacy” (the Advocacy Section) and “hearing officer” functions. Under this arrangement, the hearing officer remains totally detached from the investigatory and prosecutorial functions performed by the Advocacy Section, who is considered an indispensable party when choosing to appear in Division dockets. The hearing officer’s role, in contrast, is to manage the adjudicative process, ensure compliance with the Division’s rules of practice and procedure, conduct a fair and impartial hearing, reach findings of fact and conclusions of law, and present the Administrator with a “recommended decision and findings in writing;” whereupon the Administrator may approve the hearing officer’s recommended decision

that it has adopted the conclusions and recommendations contained in the PowerServices Report as its own and urged the Division to adopt them as well.<sup>2</sup>

National Grid, who expressed opposition to many of the findings and recommendations contained in the Report, requested that the Division consider the rationale for its contrary views and accept its alternative plan for implementing improvements regarding preparedness and restoration efforts for future storms. In support of its position, National Grid elected to principally rely on the April 19, 2012 response it initially submitted to the Division in this matter.

National Grid did, however, request an opportunity to supplement its initial response, and moved for a time extension to August 14, 2012 for submitting its additional comments. The Division granted this request.

### **3. The PowerServices Report – Conclusions and Recommendations**

As noted above, the Advocacy Section has fully adopted the conclusions and recommendations contained in the PowerServices Report. The details of these conclusions and recommendations are discussed below.

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and findings, or conduct a separate evaluation of the record and issue an independent decision on the matter in question. R.I.G.L. §39-1-15.

<sup>2</sup> In response to an information request from the Hearing Officer, the Advocacy Section indicated that the public comments received during the four comment sessions conducted during the initial phase of the investigation conducted in this docket “...support some of the observations of the Advocacy Section’s expert consultant.” However, in lieu of relying on the transcripts of the actual public comments, the Advocacy Section opined that “the Hearing Officer should rely almost exclusively on Mr. Booth’s observations, conclusions and recommendations, as well as the evidence presented by the Company.” (See August 24, 2012 Response from the Advocacy Section).

At the outset of its report, PowerServices discusses what it describes as “three key observations,” specifically: (1) that the storm delivered much less wind force in Rhode Island compared to many of the states impacted south of Rhode Island; (2) that the storm was a relatively slow moving storm providing a sufficient window of pre-incident planning for many utilities; and (3) that the customary resources National Grid would rely upon for outside assistance included utilities dealing with their own storm restoration as well as contractors previously obligated and working at utilities south of Rhode Island for many days after the storm had already impacted National Grid’s system.<sup>3</sup>

In connection with the foregoing observations, PowerServices documents a number of factual points, offers many opinions, and raises several salient questions concerning National Grid’s preparedness and restoration efforts. Such as:

- That wind speeds in Rhode Island were less than half of what they were when the storm first impacted the East Coast.<sup>4</sup>
- That “considering the National Hurricane Center forecast that was issued for Hurricane Irene on August 23, 2011, National Grid should have recognized that its required resources for outage response would need to come from locales well outside of its customary utility and contractor aide

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<sup>3</sup> Power Services Report, p. 3.

<sup>4</sup> Id., p. 4.

resources.” PowerServices contends that the “decision to utilize mobile contractor and utility storm response resources from distant geographic areas should have been made much earlier, and certainly prior to actual realization that most of the normal resources were already being used by utilities that were impacted by Irene before the storm hit Rhode Island.”<sup>5</sup>

- That the maximum recorded wind gust was 83 mph at Conimicut (Warwick), with wind gusts greater than 60 mph in multiple areas around Narragansett Bay; the remainder of the state reported gusts greater than 53 mph. National Grid measured wind gusts of 55 mph at Providence, and 54 mph at North Kingstown. In addition, the slow-moving storm battered the state for approximately a day with sustained winds of at least 37 mph.<sup>6</sup> In view of these wind speeds, and the resulting magnitude of outages, PowerServices is left questioning the strength of National Grid’s overhead power line structures. The Report states: “[g]enerally we do not observe the degree of failure on other utility systems that was experienced in Rhode Island with wind speeds at the levels that occurred in Rhode Island during Irene.”<sup>7</sup>
- Although outages were widespread across all regions impacted by Irene, the direct effect of the storm on individual electric systems was varied, as

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<sup>5</sup> Id., p. 7.

<sup>6</sup> Id., pp. 7-8.

<sup>7</sup> Id., p. 8.

was the time required to restore service to customers.<sup>8</sup> The storm began impacting National Grid's electric system in Rhode Island at 2:03 AM on August 28, 2011. Ultimately 359,569 customers in Rhode Island, 75% of National Grid's total customers, experienced power interruptions. The following Rhode Island-located assets were impacted by the storm:

Transmission Assets:

- 8 Transmission lines damaged
- 29 Sub transmission lines outages
- 37 Substations out of service

Distribution Assets:

- 206 distribution feeder circuit protective device lockouts
- 207 pole replacements
- 100 distribution transformers damaged
- Approximately 800 tree conditions that needed to be addressed by crews
- Over 1140 sections of wire down, resulting in the replacement of 23,000 feet of wire (225 sections of primary three-phase wire down, 483 sections of primary single-phase wire down and over 435 sections of secondary wire down).<sup>9</sup>

Nearly all service was restored by Sunday, September 4 with the final storm related outages restored by Monday, September 5.<sup>10</sup>

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<sup>8</sup> Id., pp. 9-19. Power Services examined damages and restoration data from the following eighteen (18) electric systems: Rappahannock Electric Cooperative (Virginia); Dominion Power (Virginia); A&N Electric Cooperative (Virginia); Potomac Electric Power Company (Maryland/Delaware); Potomac Edison (Maryland/Delaware); Delmarva Power (Maryland/Delaware); Choptank Electric Cooperative (Maryland/Delaware); Metropolitan Edison (Pennsylvania); Penelee (Pennsylvania); Jersey Power & Light (New Jersey); Public Service Enterprise Group (New Jersey); Rockland Electric (New Jersey); Atlantic City Electric (New Jersey); Connecticut Light & Power (Connecticut); United Illuminating Company (Connecticut); NSTAR (Massachusetts); and Western Massachusetts Electric (Massachusetts).

<sup>9</sup> Id., pp. 20-21.

<sup>10</sup> Id., pp. 20 and 28-29.

- Overall, most utilities south of Rhode Island experienced wind speeds twice those impacting Rhode Island and the utilities' systems were impacted no worse and often less, with restoration time equal to or better than National Grid, even when those utilities experienced far more severe storm conditions.<sup>11</sup>
- National Grid generally followed its Storm Response Plan, however, neither its Storm Response Plan nor its actions accounted for a hurricane event that moved up the coastline, impacting many regions, and utilizing the storm response resources which National Grid could normally rely on.<sup>12</sup> The storm track and impact area along the East Coast was a fact that was already predicted by the National Weather Service by August 23 when National Grid conducted its first System Storm Call. National Grid appears to have made little adjustments in its planning, preparedness, and crew resource acquisition when armed with the knowledge of the (1) storm's track, (2) the competition for the same nearby resources from utilities that would be impacted earlier than National Grid, and (3) the knowledge that it would need more crew resources by August 28 than could be secured in an area of less than eight (8) hours travel.

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<sup>11</sup> Id., p. 21.

<sup>12</sup> Id., pp. 27-28.

PowerServices characterizes this failure “as one of the major contributing factors to the duration of the restoration process in Rhode Island.”<sup>13</sup>

- All transmission related outages were repaired and back in service on Monday, August 29, limiting most transmission outages to less than 24 hours from the storm’s onset. However, there were a number of outages on the sub-transmission level (69 kV and less) that extended into Wednesday, August 31.<sup>14</sup> PowerServices observes that “transmission structure failure due to 50 mph winds is not generally expected.” PowerServices also observes that “a transmission system should be robust enough that performance of a system patrol and having to reclose breakers, at most, should be expected with wind speeds at the Irene level in Rhode Island.”<sup>15</sup>
- PowerServices opines that National Grid’s Electric Emergency Plan (“EEP”), which National Grid conformed to during its restoration work, “does not serve as a tool that is actually useful during storm recovery planning or storm recovery except to set up the organization.” PowerServices further opines that the EEP does not tie to National Grid’s current US Strategic Response Plan (“SRP”), which became effective on June 17, 2011 (which replaced National Grid’s former Corporate Crisis Management Plan). Power Services also observes that the EEP does not provide any planning

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<sup>13</sup> Id., p. 28.

<sup>14</sup> Id., p. 30.

scenarios to prepare for the challenges created by an incident on the scale of Hurricane Irene. PowerServices concludes that National Grid's failure to implement its SRP prevented the associated implementation of National Grid's Strategic Response Team ("SRT") "even though natural disasters are clearly listed in the examples of when the SRT can be invoked..." PowerServices opines that this failure denied National Grid "the wisdom and experience of top company leaders."<sup>16</sup>

PowerServices concedes that the SRT would not have significantly affected the timeliness of the recovery from Irene as well as the cost to National Grid. However, PowerServices opines that had the SRT been formed and taken the occasion to follow the storm recovery effort more closely, they would have learned significant information about the condition of their electric system in Rhode Island and any inefficiency associated with the management of the storm recovery. PowerServices adds, that upper storm response management would also have learned about the inefficiencies in their storm response organization; and "understand that winds [sic] speeds less than an afternoon thunderstorm could produce such devastating damage."<sup>17</sup>

- PowerServices does not criticize or find fault with the effort of National Grid employees and contractors after the storm passed. PowerServices'

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<sup>15</sup> Id., p. 31.

<sup>16</sup> Id., pp. 35-36.

evaluation identified system condition deficiencies, a lack of preparedness and organizational deficiencies.<sup>18</sup>

- PowerServices found National Grid’s intent and desire to keep its customers informed of their progress of getting power returned acceptable. However, PowerServices opines that these efforts were greatly limited by an intermittent failure of key technology systems creating a lack of timely and accurate outage information.<sup>19</sup>
- PowerServices contends that National Grid underestimated the possible impact from Hurricane Irene to its Rhode Island service territory. PowerServices concludes that “there is little evidence National Grid did any scenario and impact pre-planning.” PowerServices maintains that the National Hurricane Center track and predictions were very accurate and should have guided a much more comprehensive response plan; and that National Grid failed to use or accurately assess the data and the need for adjustments to its customary methods.<sup>20</sup>
- PowerServices contends that National Grid was not prepared to manage widespread customer outages in Rhode Island. PowerServices points out that the highest “Catastrophic Event classification” under National Grid’s EEP “considers an event with greater than 9% of the total customers

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<sup>17</sup> Id., pp. 36-37.

<sup>18</sup> Id., pp. 38-39.

<sup>19</sup> Id., p. 39.

<sup>20</sup> Id., pp. 40-41.

without power and an anticipated outage duration of greater than 72 hours.” PowerServices emphasizes that the EEP’s maximum event level was “eclipsed” by the 359,569 interruptions in Rhode Island, 75% of the customers.<sup>21</sup>

- PowerServices also finds that National Grid underestimated the resources that would be required to efficiently restore service to its customers in Rhode Island. PowerServices observes that National Grid’s internal resources were overwhelmed by the damage created by Irene’s winds. PowerServices questions why these internal resources were not better prepared and the system more resilient.<sup>22</sup>
- PowerServices observes that National Grid’s initial restoration response and crew staging was not central to the construction efforts in Rhode Island. PowerServices found that during the initial stages of the restoration, the additional travel time required of construction crews resulted in significant nonproductive crew-hours.<sup>23</sup>
- PowerServices found that National Grid’s communication of outage information to local government and residents was neither timely nor accurate. As evidence of this, PowerServices observed that National Grid’s internal and external IT systems used for outage information experienced intermittent performance issues; and that customers and local

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<sup>21</sup> Id., p. 41.

<sup>22</sup> Id., pp. 43-44.

governments experienced frustration in accessing outage restoration information and updates.<sup>24</sup>

- That because National Grid denied PowerServices’ request for interviews, combined with all of the other facts gathered, PowerServices concludes that National Grid “lacked the experience and prior scenario planning necessary to respond more effectively to the events of Irene.” PowerServices calls this “disturbing, considering the criticality of the electric infrastructure and power supply to facilitate all other emergency responses to human safety.”<sup>25</sup>
- PowerServices also contends that National Grid’s electric system experienced structural failures that are inconsistent with the typical performance of similar facilities designed using adequate engineering criteria under a comprehensive maintenance program. PowerServices opines that the “visual review of the broken and downed transmission line poles indicate insufficient engineering design and maintenance.”<sup>26</sup> PowerServices notes that since 2005, many utilities with transmission line facilities in proximity to coastal areas have implemented “System Harding” improvements. PowerServices observes: “from the meteorological data and our review of the leaning poles with downed conductors, there appears to

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<sup>23</sup> Id., pp. 44-45.

<sup>24</sup> Id., pp. 45-46.

<sup>25</sup> Id., pp. 46-47.

<sup>26</sup> Id., p. 47.

be indications of inadequacies including: insufficient pole burial depths for soil conditions, lack of engineering consideration of the effect of additional pole attachments, and poorly attached conductors to electric structures. With this in mind, it is obvious the damaged facilities... were not designed, constructed, and maintained to proper industry standards.”<sup>27</sup>

At the conclusion of its Report, PowerServices offered a large number of recommendations, which it declares would improve National Grid’s preparedness for future storms. The totality of these recommendations is provided below:

#### Outage Avoidance

- a. National Grid needs to evaluate further options to improve its sub-transmission and transmission pole inspection programs. National Grid has an Inspection and Maintenance program for transmission and sub-transmission assets. The transmission program consists of helicopter visual patrols twice per year and infrared patrol once per year. In addition, a ground based visual patrol is scheduled every five (5) years<sup>1</sup>. The sub-transmission program consists of a helicopter visual patrol once per year. PowerServices recommends that all transmission structures be visually inspected annually, and sub-transmission structures should be visually inspected every two years.

<sup>1</sup> National Grid- Responses to Division Data Requests- Set 2: Division 2-6

- b. National Grid should evaluate the structural loading for all transmission structures based upon the current NESC loading criteria. Analysis should consider the degradation of facilities from aging and additional storm hardening measures such as increased pole classes and storm guying for structures with coastal exposure. Since, National Grid does not utilize a specific hardening program for transmission or sub-transmission structures,

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<sup>27</sup> Id., pp. 47-50.

all asset replacement and/or maintenance work is identified during periodic inspections based on condition-based assessments driven by the I & M Program<sup>2</sup>. PowerServices recommends these additional analyses and upgrades be integrated into National Grid's existing I & M Program.

<sup>2</sup> National Grid- Responses to Division Data Requests- Set 2: Division 2-7

- c. National Grid should develop a process for fully documenting the replacement of poles in a major outage event and then conduct a post-storm analysis to correlate the downed poles age, previous condition based on inspection information, and failure cause. This analysis will assist National Grid in accurately gauging the condition of the distribution and transmission system and its performance in various incident conditions. These findings would be implemented as additional criteria to more effectively guide Inspection and Maintenance (I&M) improvement dollars.
- d. National Grid should follow the current National Electrical Safety Code ("NESC") requirement stipulating that structures shall be replaced or rehabilitated when deterioration reduces the structure strength to 2/3 of that required when installed.
- e. National Grid's response to Division 2-8 (Engineering and Design) outlines an appropriate Joint-Use Pole "Make Ready" process. Our observation, however, leads us to believe the process described is either not followed by all joint-use parties or the "shared responsibility" process lacks an ultimate responsible party and some deficiencies in strength arise. We recommend National Grid perform a post storm strength assessment on 30 miles of joint-use pole lines, randomly selected, that were involved in line outages, particularly lines in which poles failed or leaned over.

### Pre-Storm Planning

#### *Predicting Storm Damage*

- a. National Grid needs to improve its storm damage prediction processes. Additional weather forecasts

should be considered when evaluating future weather conditions to improve accuracy. National Grid should implement a process that better utilizes the outside support of a weather analyst to evaluate forecast conditions and provide guidance whenever expected conditions could warrant an EEP Level 4 or 5 emergency response. During the anticipation phase preceding the storm event, National Grid's interpretation of the storm's relative strength and impact from a change in tracking undershot the event. Furthermore, for hurricanes or tropical storms which provide significant time for planning, National Grid needs complete and adequate scenario planning incorporated into its processes and documentation.

- b. Prediction tools should be developed that consider storm damage history, operational capability, and susceptibility to damage to determine approximate crew requirements based upon forecast conditions. The ability of these new processes should also incorporate the ability to scale resources based upon the duration of the event. National Grid's planning and response management ultimately considered a 3-day event restoration window for Hurricane Irene was most likely. This underestimate in preparedness planning undoubtedly created a bottleneck later in the restoration process as additional resources were needed. Furthermore, adequate plans will outline the alternative resources for materials, crews, and support services well outside of the customary area of availability.

#### *Activation of EEP*

- a. National Grid did initiate its EEP processes preceding the storm event. However, the corporate storm response management team was not fully integrated into the restoration process. National Grid should implement the Strategic Response Team (SRT) as clearly provided for in the EEP process and can be invoked as listed in the new "US Strategic Response Plan" (SRP) initiated in June of 2011.

#### *Mobilization*

- a. National Grid needs to evaluate and improve its processes in procuring additional restoration resources. During the anticipation phase, National Grid did participate in NEMAG conference calls. However, these activities did not guarantee or establish significant crews for National Grid until well into the restoration process. National Grid needs to establish further mutual aid agreements with various organizations such as NEPPA to take advantage of their 74 member utilities, surrounding cooperation utilities in Vermont, Maine, New Hampshire, New York, and the New York Power Authority. National Grid should also contract with the larger utility contractors in the Southeast and Midwest to be able to place their personnel and equipment on various levels of standby.
- b. National Grid has a serious deficiency in digger/derrick line trucks in Rhode Island. One of the reasons is that National Grid probably has not been replacing a suitable number of poles. PowerServices compared the State of Rhode Island to other similar sized utilities. Jacksonville Electric Authority (JEA) in Florida is a similar physical and electric load size to Rhode Island. JEA maintains 26 digger/derrick line trucks compared to the 10 that National Grid had available in Rhode Island before the Irene restoration. Similar to the State of Florida's electric structure hardening requirements, the RIPUC should consider adopting a mandate to have each distribution pole tested on an eight year cycle. The reports from these pole tests will produce a list of danger poles and marginal poles. Danger poles should be changed immediately and marginal poles should be changed within the next twelve months. Because this pole work would be continuing, National Grid should plan to change them with local internal resources. A larger compliment of digger/derrick line trucks will be required to address pole replacements within Rhode Island.

#### Storm Restoration-Response

##### *Restoration Priority*

- a. National Grid currently uses a simplistic approach to setting restoration priority. National Grid states that the

largest number of customers will receive attention first. The problem with this approach is that it does not maximize the effectiveness of the available labor hours.

- b. National Grid already seems to be fairly efficient in their transmission restoration process as demonstrated during the Irene restoration.
- c. PowerServices suggests the following priority:
  - i. Personnel would be dispatched from their local service areas to outages based on:
    - (1) Restoring transmission/sub-transmission
    - (2) Restoring substation power supply
    - (3) Restoring circuits
    - (4) Restoring major taps
    - (5) Restoring minor taps
    - (6) Restoring individual customers

*Note: This process will naturally limit the effects of cold load pick up suddenly overloading a line section.*
  - ii. The highest priority should be given to electric circuits serving electric loads critical to health, environment, and commerce.
    - (1) Hospitals, Water Plants, and Sewer Plants
    - (2) Traffic signals at major intersections, toll booths, guarded railway crossings, and movable bridges.
    - (3) Industrial Centers, Ports, Commercial Centers, Farms
  - iii. National Grid should work with local agencies to set up care shelters for critical need customers. The centers should have backup generators with food, water, and oxygen. The first communications before the storm arrives would be to communicate with critical care customers the need to relocate to a shelter.
  - iv. The first activities after the storm would be to isolate effective areas to be able to get the substations and then circuit main lines back on. The initial phase of storm damage evaluation can take place as experienced crews are dispatched to isolate switches and tap lines. Dispatching

construction crews should not wait upon damage assessment but should be a part of damage assessment.

- v. Electric system planning should consider this priority list when scheduling rebuilding lines and facilities. The highest priority circuits should be constructed with back up loop feeds to assure these can be restored first.

#### *Damage Assessment*

- a. An inefficient damage assessment process can be effectively a bottleneck in the storm restoration process. Typically, the main forces of construction crews will not be effectively dispatched until the assessment results are analyzed and processed. National Grid should take additional steps to improve the time required to complete Phase 1 and 2 damage assessments.
  - i. Analyze, process map, and evaluate methods that would streamline all areas within the Damage Assessment process.
  - ii. Insure that the processes and systems are scalable to manage the volume of information in a major event.
  - iii. National Grid needs to increase the frequency of refresher training for damage assessors and wires down personnel to twice per year.

#### *Technology/Communications*

- a. National Grid should evaluate all technology and communication systems that are currently employed as part of the outage process. National Grid experienced performance issues during Irene that hindered timely and accurate outage information and Estimated Time of Restoration (ETR's) to National Grid employees, local government representatives, and electric customers. Part of this evaluation should include supporting internal and external information delivery from the system incidents during both a centralized outage response and a decentralized response. Technology systems should have access to backup and recovery options that will allow branch

divisions to operate during system incidents. During Irene many of the technology issues encountered were from the inability of the centralized systems to handle the scale of the information requests.

#### Emergency Preparedness Plan

- a. National Grid's EEP should be sufficiently comprehensive and specific to use as a handbook during any electric system emergency. Develop a pocket guide that can be distributed to each storm participant. The guide should define the management process, positions, and organization structure used to prepare for, plan, and respond to incident conditions. The objective of the guide would be to give employees specific guidance in a concise format to aid in responding to all sizes and types of events.
- b. National Grid should review the response levels in the emergency plans to determine whether to modify or add a response level for an event the severity of Irene or greater. The current EEP's maximum event level was eclipsed by the number of outages created within the region by Irene, for Rhode Island, the outages totaled nearly 360,000 interruptions, approximately 75% of the customers.
- c. National Grid needs to implement specific operational plans that consider and address all local offices (branch, wires down, etc), staging sites, and material yards based upon the increased local area restoration efforts. The requirements necessary to adequately operate each type of site needs to be evaluated and addressed as needed. Support logistics, material inventory, operations, and fleet all need to consider worst-case scenarios for dealing with restorations on the scale created by Irene. These plans would be in concert with EEP; however, these specific plans would need to be updated at least quarterly.
- d. National Grid's EEP should contain specific scenarios for restoration in Rhode Island. Efficient restoration of distribution outages is best managed by local service areas. The benefit would be that resources that are already in the area and familiar with the area would know

that they are assigned to their home area for a storm recovery event. The local service area size should be based on the number of customers and number of circuits that can be reasonably managed in an Irene type outage or severe snow or ice storm. Also, the management team size should be limited by the number of crews they can reasonably manage. In the case of Tropical Storm Irene the Branch Director for Rhode Island was responsible for 78 bucket trucks, ten line trucks, and 378 other vehicles. A single branch office directing the recovery could not possibly dispatch and understand the location and activity of these crews throughout the entire State of Rhode Island. The large number of outage events and the large number of crews would lead to a lot of standby time for the crews and inefficient dispatching. The objective in the local service area management approach is to put as many people as possible working on the various outage incidents that restores service to the greatest numbers of customers the fastest. Manpower in standby or while traveling are not effective in meeting this goal. Therefore, the outage management centers need to be localized to minimize the stand-by time and travel. Pictures of mass truck parks are impressive but are inherently inefficient. Crews must wait in line for supplies, fuel, and work assignments. Construction crews should be placed in the field as quickly as possible. When a crew finished a task they should have been ready and immediately dispatched to the next task. A crew should not have to return to the rallying location except to start in the morning and when finished for the day. The management team is responsible for keeping track of where crews are located in the service area and making efficient decisions as to the best use of the available resources. For example, a crew foreman sees that he can clear a tap line with two minutes work while he is already in the area. The foreman should have the freedom to make such decisions to improve recovery efficiency even though the tap line does not fit in the written priority scheme.

- e. National Grid's EEP should make provisions for the entire National Grid service territory to be divided into local service areas sufficiently small that several persons have

local knowledge of the streets, feeders, and substations and the following:

- i. Circuit switching locations
  - ii. Feeder protective device locations
  - iii. Feeder routing
  - iv. Familiar with circuit voltage, conductor size and loading characteristics
  - v. Familiar with weak points such as old and/or small conductor
  - vi. At least one of these knowledgeable individuals needs to be the local area manager or have someone knowledgeable available to advise the local area manager during the restoration process.
- f. The EEP should contain strategies to recover from any problem faced during the emergency. For example: If the communications system fails, how will information be passed to protect employees when a line section is re-energized? When the substation batteries fail what source of power is available to re-energize the system?
- g. The EEP should contain precise strategies for facing various scenarios of damage to the electric system including individual major pieces of equipment to various intensities of system damage.
- h. The EEP should contain local power company facility maps and contact information.
- i. The EEP should contain special safety instructions to be used during the recovery period including LOCK/OUT-TAG/OUT. With numerous instances of lines laying on the ground and multiple crews working on lines the standard rule should be to work behind a visible open point with the immediate system grounded. During the process of re-energizing a line section there is a brief period when the grounds are removed and the protective device or switch used to re-energize the line. Knowledge of where the section being energized feeds is of paramount importance. However, communicating with the crews working in the area to insure that they are in the clear is even more important to protect crews and the public. This process falls under a written LOCK/OUT-

TAG/OUT scheme that all personnel involved in the recovery must understand and follow.

- j. Tropical Storm Irene involved mass circuit outages. The first step in the distribution system process is to recover and re-energize circuits quickly. Therefore, the first exercise toward restoration should be to travel each main line of each circuit, record the physical damage, and isolate each switch point and protective device tap. The open points need to be marked in such a way to let other repair workers know that the open point is dedicated to future work and not to close it. That way, the main trunk of the feeder can be re-energized when the substation is energized and the main trunk is free of defects.
  
- k. National Grid should create or expand partnerships with local and State emergency managers. To further strengthen these relationships, management-level personnel should be authorized to make operational decisions and work routinely with local and State emergency service agencies. National Grid operational personnel need to make contact with their counterparts in local government public works and transportation agencies. The purpose is to initiate a joint planning process among the utility and public sectors. National Grid should also make every effort to improve communication links with emergency service agencies by integrating the following into the EEP and restoration process.
  - i. Contact information for local emergency and governmental authorities.
  - ii. National Grid should participate with local authorities with mutual aid support agreements.
  - iii. A National Grid representative should accompany each local emergency service vehicle throughout the main traffic arteries to insure that the first responders do not face any electrical hazards. When trees are down in streets local governments will be clearing the streets as quickly as possible. By coordinating with the local government, National Grid might use their heavy equipment to clear large trees from power lines saving time and expense in the restoration effort.

- iv. National Grid should provide training to local emergency personnel and utility workers to recognize the hazards of a downed power line or a cablevision or phone line.
- v. National Grid in concert with the local governments should establish a generator policy so that lines down might not be energized by a generator back feed.
- vi. National Grid should cooperate with local authorities in establishing a shelter where at risk residents can have power for medical devices. Thereby, National Grid can direct high risk customers to these shelters while awaiting system recovery.
- vii. Lists of local government facilities with critical power needs:
  - i. Critical traffic intersections
  - ii. Critical pumping stations (water , sewer, and storm sewer)
  - iii. Critical government facilities and shelters

#### Division

1. The Division should encourage and implement the following activities:
  - a. Electric utilities in the State of Rhode Island should adopt mutual aid and assistance agreements with utilities in neighboring states including the electric municipal utilities.
  - b. In conjunction with the efforts of the Rhode Island Emergency Association (REMA), local governments should make agreements for mutual aid with each other, state department resources, and the private utilities. These parties should coordinate annual incident response drills to verify the effectiveness of these coordinated responses.
  - c. Require hourly utility reporting during major system outage events and a final comprehensive report should be filed within 90 days by National Grid similar to the requirements now mandated in the State of Massachusetts.

In its concluding comments, PowerServices notes that its evaluation of National Grid's response to Irene focused on National Grid's: Storm Preparedness Plan, Pre-storm planning, Pre-storm resource staging, Management decision process, Storm tracking, Comparable utility response to Irene, Storm and post-storm response (including materials, labor, crew availability, dispatch and escort staff and coverage and hours worked), Outage restoration process and prioritization, Facility failures (including transmission and sub-transmission, distribution and joint-use lines), National Electrical Safety Code and strength compliance, Post storm assessments, and Lesson learned evaluations.<sup>28</sup>

PowerServices describes Irene as a unique storm, due to its path and the fact it impacted numerous electric utilities along the East Coast across several states. PowerServices observes that because of its path, the last areas impacted were unable to receive rapid assistance from the customary surrounding areas because the utilities in those areas were already using all of the available resources for their own outage restoration efforts. PowerServices contends that it is during times of limited resource availability that efficient emergency planning is vital. PowerServices argues that National Grid should have recognized much earlier that its generally available mutual aid resources from other utilities and contractors would simply not be immediately available.

PowerServices also opines that National Grid's storm response plan is more appropriate for ice and snow storms, not hurricanes. The Report finds that

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<sup>28</sup> Id., pp. 65-66.

National Grid's EEP "is simply too generic and non-specific to serve as an adequate tool for major regional or east coast storm response actions." PowerServices criticizes National Grid for failing to recognize and have a "Storm Response Immediate Contingency Plan" in place to initiate acquisition of resources outside of the customary area of available resources.<sup>29</sup>

#### **4. National Grid's April 19, 2012 Response to the PowerServices Report**

National Grid filed responses to the PowerServices Report on April 19 and August 14, 2012, infra. In its April 19 response, National Grid addressed, what it described as, three significant areas of concern identified in the Report. Namely, (1) the Report's questioning as to "why the system did not perform better under a tropical storm event with relatively low wind speeds;" (2) the Report's assertion that National Grid's EEP was an ineffective tool during storm recovery planning and preparation, and that National Grid should have been better prepared given the advance notice of the storm's path and projected strength; and (3) the Report's recommendations regarding National Grid's "external communications."<sup>30</sup>

On the first point, system reliability concerns, National Grid contends that PowerServices "does not take into account the length of the storm and the sustained duration of wind, or the impact that trees had on the distribution line failures and pole damage." National Grid argues that its Feeder Hardening

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<sup>29</sup> Id., pp. 67-68.

<sup>30</sup> National Grid's April 19, 2012 Response, p. 2.

Program is designed to address reliability concerns “due to animals, deteriorated equipment and lightning,” not “worse case scenario storm events.”

National Grid observes that although Irene was downgraded from a hurricane to a tropical storm, it, nonetheless, maintained enough strength to cause significant tree damage. National Grid notes that the storm remained over Rhode Island throughout the day, with sustained winds of 37 mph and gusts up to 83 mph. National Grid argues that the lengthy duration of these strong winds along with average rainfall amounts of 2-4 inches, which caused saturated soils, “created favorable conditions for a relatively high incidence of full tree failures.”<sup>31</sup>

National Grid next asserted that its construction standards and design practices ensure that its lines meet or exceed the strength requirements of the National Electrical Safety Code (“NESC”). The Company added that it uses conservative assumptions about conductor sizes, line angles, equipment weight and sizes and joint user attachments, thereby ensuring that all its distribution poles meet or exceed NESC strength requirements. National Grid emphasizes that its transmission design practices also incorporate all NESC strength requirements.<sup>32</sup>

National Grid notes that as a result of Irene, it replaced 207 poles, less than 0.07% of the more than 300,000 poles in Rhode Island; and that most of the

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<sup>31</sup> Id., pp. 2-3.

<sup>32</sup> Id., p. 3.

failed distribution poles were related to tree damage. Accordingly, National Grid disagrees with the Report's conclusions that the failures in the Company's distribution system stem from "insufficient engineering design standards anticipated by the NESC." National Grid argues that its experience during Irene reflects that most of the distribution line damage resulted from fallen trees and limbs or other flying debris, and not because of insufficient engineering design.<sup>33</sup>

With respect to the issue of third-party attachments on National Grid's poles, the Company argues that "a shared responsibility model is used to identify the effects of an additional attachment to an existing pole when that pole is jointly owned with Verizon." National Grid notes that it and Verizon "jointly identify the full scope of make ready work required to allow another attachment to the pole," which includes an evaluation of clearance, strength and pole condition to ensure all NESC requirements are satisfied. National Grid does acknowledge, however, that some joint-use parties "do not follow the appropriate process to license and obtain approval for their attachments to the Company's distribution poles."<sup>34</sup>

National Grid next addressed PowerServices critique of National Grid's EEP, which the Company describes as a "high-level, tactical document [and] not an operational field guide for local service personnel as the... [Report] suggests." National Grid argues that the incident classification levels described in the EEP include preparation for an incident on the magnitude of Irene, as well as

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<sup>33</sup> Id., pp. 3-4.

<sup>34</sup> Id., p. 4.

procedures to decentralize and manage distribution system recovery in the local service units. As an example, National Grid points out that “incident classification level 5 includes any restoration that may last more than 72 hours, and the EEP describes a procedure for decentralization to the substation level, which is typically considered the most localized response organization in the industry.” National Grid also notes that the EEP also incorporates, by reference, the Company’s SRP, which presents a scalable approach to storm events based on the type, severity, and impact, and allows more information to be available to management as the event unfolds.<sup>35</sup>

National Grid agrees with the PowerServices recommendation that it procure additional restoration resources. Indeed, the Company says it has already taken steps to address these concerns; and has been expanding relations with line contractors based outside of the Northeast and Eastern Coast Regions.<sup>36</sup>

National Grid also responded to PowerServices’ assertion that the Company’s damage appraisal process did not adequately scale to assess damage created by the storm and that damage assessments were not completed within timeframes planned for in the Company’s EEP. On this question, National Grid argues that damage appraisal and damage assessment is not a singular process for the Company, and is not a limiting factor to the deployment of crews or the preparation of Estimated Times of Restoration (“ETR”). National Grid explains

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<sup>35</sup> Id., p. 5.

<sup>36</sup> Id.

that during the early stages of system evaluation, multiple avenues are utilized to provide insight into the damage and the deployment of resources, including field resources and aircraft. National Grid acknowledges however, that damage appraisal is an area that requires additional structure for future storms, and that the Company is undertaking steps to improve this process. National Grid also acknowledges that it did not timely complete damage assessments of the phase 1 feeder evaluations and the phase 2 taps off of the mainline in accordance with the EEP, and that it is taking steps to address these deficiencies as well.

To improve its damage appraisal performance for future storms, National Grid explains that it plans to employ a statistical sampling approach based on geographical areas rather than circuits. National Grid believes that it will be able to provide a better initial ETR once a specific amount of data is available to extrapolate the damage to an area. The Company relates that it plans to locate external resources to appropriately scale the efforts based on the area impacted. National Grid notes that it has a modified version of this process in place for incidents in the near future, and expects to have a “robust” process model ready for deployment later this year.<sup>37</sup>

National Grid adds that it is also reviewing by survey the skill sets of employees with damage assessor storm assignments, and is making adjustments to ensure that there is optimal alignment between skill sets and damage assessment responsibilities. National Grid states that it has also adopted

a plan that will allow, if conditions permit, damage assessment activities to take place around the clock for future storms.<sup>38</sup>

National Grid's final response was directed at the communications and outreach concerns expressed in the Report. Regarding this matter, the Company emphasizes that it is expanding its partnerships with all levels of state and local government to better serve its customers. National Grid offers the following details on these initiatives:

- National Grid Senior Leadership has established a quarterly meeting with State and RIEMA leadership to review the Company's storm preparedness plan and readiness.
- The Company is working with its local communities, including public works and First Responders, to establish five or six Regional Zones with dedicated National Grid, state, and local crews that will be dedicated to clearing roadways of any electrical hazards. This collaborative effort will expedite the opening of roadways to allow emergency personnel to respond to any public safety issues
- The Company is conducting town-by-town meetings throughout the year with local officials on storm/emergency response.
- The Company has hosted three annual meetings with First Responders all across the state to review its "Blue Sky" day emergency procedures and its storm response.
- The Company is working on developing a formal First Responder training program for gas and electric emergencies and expects to roll out this training in mid-2012.
- The Company will assign Community Liaison's [sic] to communities during major storm events to provide specific community updates on critical restoration efforts and overall ERTs. These individuals will be

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<sup>37</sup> Id., pp. 6-7.

<sup>38</sup> Id., p. 7.

provided with electrical distribution maps that will help tell the story of what is happening and what needs to be done in each city or town.<sup>39</sup>

## **5. PowerServices' Response to National Grid's April 19, 2012 Response**

On May 16, 2012, PowerServices issued a written response to National Grid's April 19, 2012 response to the PowerServices Report. The response focuses on the areas of disagreement.

At the outset, PowerServices asserts that it is essential to recognize that its review of National Grid's storm preparedness, response and restoration efforts "must be placed in the context that National Grid controls not only the flow of data from a storm event, but more importantly controls the accuracy of the collection process and thoroughness of the post-storm assessment process."<sup>40</sup> However, PowerServices also points out that in preparing its Report, it also relied on the "considerable utility response experience of the PowerServices team; and the Hurricane Irene response information collected from other utilities along the East Coast and within the North East "by an experienced team that has dealt with dozens of hurricane events, including the effects and aftermaths."<sup>41</sup>

Addressing the issue of storm hardening and the impact of trees first, PowerServices maintains that its Report does not significantly discount the impact of tree failures on the outages. PowerServices adds that National Grid's feeder evaluations should not be just for reliability concerns associated with

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<sup>39</sup> Id., pp. 7-8.

<sup>40</sup> PowerServices May 16, 2012 Response to National Grid's April 19, 2012 Response, pp. 1-2.

<sup>41</sup> Id., p. 2.

animals, deteriorated equipment, and lightning, “but the overall quality and ranking of the feeders which, per our understanding, has included pole strength, the amount of joint use attachers and their impact on pole strength, the overall quality of the line construction strength to withstand ice and tropical windstorms and other storm events, together with the general quality of the circuits to be in full compliance with the National Electrical Safety Code... and the construction standards of the company based on feeder hardening and overall enhanced system reliability and feeder reliability improvement.” PowerServices observes that the incorporation of practices to improve system performance during storm events may drive future operating initiatives including: shorter life cycles for key pole facilities, pole inspection and maintenance, heavier and more frequent pole guying, and the addition of a system reliability component to Vegetation Management planning. PowerServices also argues that the level of pole failures and other failures require a level of improved post-storm assessment to clearly define whether they are due to tree failures versus other line equipment, such as insulator ties, preformed ties, or other system equipment failures. In closing, PowerServices observes that its “team’s experience with tropical storms and, more significantly, hurricanes, did not exhibit the level of National Grid failures seen with this tropical storm and, therefore, still leaves open the issue of failures beyond simply full-tree failures.”<sup>42</sup>

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<sup>42</sup> Id., p. 4.

PowerServices also continues to disagree with National Grid with respect to the Company's post-storm engineering analysis and the Company's compliance with NESC standards. PowerServices notes that although National Grid addressed a major transmission structure failure in its response, it conceded that the failed pole 'was not retained for examination' and 'the Company's usual detailed analysis of its condition and the cause of the failure could not be done.' PowerServices opines that "prudent utility practice would be to perform a post-transmission structure failure analysis and we would anticipate that the Company's North American Electric Reliability Corporation ("NERC") documentation would indicate that a company under those standards would, in fact, perform a post-transmission structure failure analysis. PowerServices asserts that the transmission structure clearly failed either due to a design flaw, an installation flaw, or a maintenance deficiency. PowerServices also notes that this transmission structure accounted for nearly 50% of the customers who lost service.

Lastly, regarding third party pole attachments, PowerServices points out that National Grid does not explain "when in the process it realizes that (1) third party attachers did not follow the appropriate process, (2) what the Company does in those instances, or (3) how they quantify the magnitude of the issue." PowerServices observes that there is no indication in National Grid's response that it plans to address its joint use attachments through a system inventory and

NESC pole audit process. PowerServices asserts that the NESC teaches that as a pole owner “you get what you inspect, not what you expect.”<sup>43</sup>

## **6. National Grid’s Supplemental Response to the PowerServices Report**

National Grid submitted a supplemental response to the PowerServices Report on August 14, 2012. In its supplemental response, National Grid specifically addresses each of the recommendations covered in the Report. The Company’s responses are documented below:

### **1. Outage Avoidance**

#### *PowerServices’ Recommendation:*

National Grid needs to evaluate further options to improve its subtransmission and transmission pole inspection programs. National Grid has an Inspection and Maintenance program for transmission and subtransmission assets. The transmission program consists of helicopter visual patrols twice per year and infrared patrol once per year. In addition, a ground based visual patrol is scheduled every five (5) years. The subtransmission program consists of a helicopter visual patrol once per year. PowerServices recommends that all transmission structures be visually inspected annually, and sub-transmission structures should be visually inspected every two years.<sup>44</sup>

#### *Company’s Response:*

The Company does not agree with PowerServices’ recommendation to visually inspect all transmission structures annually and to visually inspect sub-transmission structures every two years. This recommendation will add additional costs to the Company’s I&M Program without producing increased benefits to National Grid’s customers that are provided by the Company’s current programs. The Company’s current approach of using aerial patrols and ground based inspections, working in tandem, form a cost-effective means of identifying asset condition issues that must be addressed to

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<sup>43</sup> Id., p. 7.

<sup>44</sup> Booth Report at pages 50-51. (The footnote numbers contained in these responses differ from the numbers that appear in the actual Company response submittal).

deliver reliable service to customers. Moreover, the Company does not believe that increasing the frequency of such inspections from a five-year cycle to a one-year cycle will result in increased detection of issues with its structures, since structures do not typically deteriorate rapidly. Thus, increasing inspection frequency to once per year will increase costs without producing any meaningful benefit to the Company or its customers.

Also, as part of its Asset Management process, the Company periodically reviews its I&M Programs and considers options for enhancement. For example, the Company plans to include a ground-based visual patrol of its sub-transmission structures in its Distribution I & M program and complete the inspections on a six-year cycle.

PowerServices' Recommendation:

National Grid should evaluate the structural loading for all transmission structures based upon the current NESC loading criteria. Analysis should consider the degradation of facilities from aging and additional storm hardening measures such as increased pole classes and storm guying for structures with coastal exposure. Since, [sic] National Grid does not utilize a specific hardening program for transmission or sub-transmission structures, all asset replacement and/or maintenance work is identified during periodic inspections based on condition-based assessments driven by the I & M Program. PowerServices recommends these additional analyses and upgrades be integrated into National Grid's existing I & M Program.<sup>45</sup>

Company's Response:

The Company refers the Division to the National Grid April 19, 2012 Response for its position on this recommendation.<sup>46</sup> In addition, the Company provides the responses below.

National Grid does not agree with PowerServices' recommendation to upgrade its transmission structures as part of its existing I&M Program. Instead, National Grid suggests that when transmission structures are replaced due to condition or system upgrades, that they are constructed in conformance with the current version of the NESC.

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<sup>45</sup> Id. at page 51.

<sup>46</sup> National Grid April 19, 2012 Response at pages 3-4.

The estimated cost of implementing PowerServices' recommendation is approximately \$30 million to \$60 million. To perform this recommendation, the scope of work would include replacing 500 transmission line structures and reinforcing 750 transmission line structures. This work is not included in National Grid's present capital plans; it is also not required for conformance with the NESC. National Grid's approach suggested above would add approximately 10% to 20% to the average cost of each structure replacement.

National Grid's transmission I&M Program requires that all lines be visually inspected once every five years. Under the I&M Program, defects are identified and prioritized as follows: repairs are made almost immediately for the highest priority, within one year for medium priority, and within three years for lower priority. Thus, upgrading existing structures to conform with the current version of the NESC under the I&M Program implies that the Company would complete the work and make expenditures within approximately eight years.

The current I&M Program assesses transmission pole circumference at the ground line as well as the presence of other forms of deterioration. I&M inspectors review steel lattice tower structures for the quality of existing protective coating on the steel members and the degree of deterioration of steel members. They also evaluate steel pole structures based on the degree of steel deterioration and the condition of the foundation. I&M Program inspectors are unable to identify whether structures conform with the NESC. This is because assessing conformance with the NESC depends on several site-specific factors that are not apparent during an inspection, such as the vertical and horizontal loads carried by the structure.

Prior to 1977, the NESC required that companies design transmission line structures for only one condition: ice on the cables with a concurrent 40 to 56 mile-per-hour wind. (See Rule 250B - combined ice and wind district loading). In 1977, the NESC added a requirement to withstand an extreme wind of 90 miles-per-hour, and, in 2002, it increased the extreme wind condition to as much as 120 miles-per-hour. (See Rule 250C - extreme wind loading). Finally, in 2007, the NESC added a requirement to withstand an additional combined ice and wind condition. (See Rule 250D - extreme ice with concurrent wind). At each of these changes, the NESC stated that

companies were not required to modify existing lines that conformed with an older NESC requirement. (See Rule 013b).

Finally, PowerServices' recommendation to upgrade existing transmission structures to conform with the current NESC is not appropriate as part of the I&M Program. Aside from the costs, which are not included in the I&M Program budget, I&M inspections are conducted by personnel who are trained primarily to recognize defects that require repair. To determine which transmission structures need upgrades requires a detailed structural analysis by an engineer using the specific loads carried by each structure. Also, due to the number of required structure replacements, each circuit would have to be addressed as a separate project due to the complexity of issues, such as outages (de-energizing lines to perform the work), permitting, and resource planning.

PowerServices' Recommendation:

National Grid should develop a process for fully documenting the replacement of poles in a major outage event and then conduct a post-storm analysis to correlate the downed poles age, previous condition based on inspection information, and failure cause. This analysis will assist National Grid in accurately gauging the condition of the distribution and transmission system and its performance in various incident conditions. These findings would be implemented as additional criteria to more effectively guide I&M improvement dollars.<sup>47</sup>

Company's Response:

The Company currently documents the replacement of poles in a major outage event through a confirming work order process. In addition, the Company believes that a post-storm failure analysis will not provide any meaningful insight regarding spending of I&M improvement dollars. The Company's current practice is to investigate the failure of transmission structures. Regarding distribution structures, as a result of Irene, the Company replaced 207 distribution poles. This is 0.07% of the approximately 273,000 distribution poles in Rhode Island<sup>48</sup>. Most of the failed distribution poles were related to tree damage. The Company's construction standards and design practices ensure that the Company's lines meet or exceed the strength

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<sup>47</sup> Id. at pages 51-52.

<sup>48</sup> In the National Grid April 19, 2012 response, the Company incorrectly stated that there were "over 300,000" poles in Rhode Island. Instead, there are approximately 273,000 distribution poles in Rhode Island and approximately 284,000 combined distribution, sub-transmission and transmission poles, structures, and towers in Rhode Island.

requirements of the NESC. Moreover, the Company's distribution construction standards make conservative assumptions about conductor sizes, line angles, equipment weights and sizes and joint user attachments. This ensures that all distribution poles meet NESC strength requirements and that most distribution poles exceed those requirements. Accordingly, implementing a post-event failure analysis program with a sample that is not statistically significant would provide little if any insight for either the I&M or Asset Strategy programs. Furthermore, the Company believes that requiring additional documentation on failure cause during the event from its field forces would interfere with the primary objective of restoring service to customers.

*PowerServices' Recommendation:*

National Grid should follow the current National Electrical Safety Code ("NESC") requirement stipulating that structures shall be replaced or rehabilitated when deterioration reduces the structure strength to 2/3 of that required when installed.<sup>49</sup>

*Company's Response:*

The Company's existing construction standards meet or exceed the NESC's requirements. On the distribution system, pole condition is assessed based on visual inspections. The Company is currently investigating technology that could be used to perform non-destructive testing, which would quantify the percentage of remaining pole strength. On the Company's transmission system, pole condition is assessed every ten years through a detailed inspection that estimates the remaining effective groundline circumference of each pole. This is used to assess whether the pole continues to meet the NESC requirements or whether it should be replaced.

*PowerServices' Recommendation:*

National Grid's response to Division 2-8 (Engineering and Design) outlines an appropriate Joint-Use Pole "Make Ready" process. Our observation, however, leads us to believe the process described is either not followed by all joint-use parties or the "shared responsibility" process lacks an ultimate responsible party and some deficiencies in strength arise. We recommend National Grid perform a

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<sup>49</sup> Id. at page 52.

post storm strength assessment on 30 miles of joint-use pole lines, randomly selected, that were involved in line outages, particularly lines in which poles failed or leaned over.<sup>50</sup>

*Company's Response:*

The Company currently has a robust "Make Ready" process as outlined in its response to Division 2-8. Thus, a random strength assessment is not warranted. While the Company acknowledges that some joint-use parties do not follow the appropriate process for obtaining approval and licenses for their attachments to the Company's distribution poles, when that process is followed, adequate pole strength is assured.<sup>51</sup> Indeed, unauthorized attachments are something all pole owners encounter and need to mitigate.

The Company handles unauthorized attachers that do not follow the approval process as follows: Under each of the aerial attachment license agreements, National Grid has the right to perform a survey at the cost of the attachers at any time. In 2009, National Grid conducted a complete survey of attachments and found 54,049 unauthorized attachments in Rhode Island, not including municipal attachers. For the municipal attachers found during the survey, our records were updated to reflect the attachment. National Grid treats municipal attachments like any typical attacher, except they are not charged an annual pole rental fee. Notably, various municipalities have recently been placing fiber optic cable on National Grid's poles without the Company's permission. When this is discovered, the Company notifies the municipalities about the illegal attachments, and any obvious clearance and loading violations are corrected.

Since the pole attachment inventory audit, National Grid has identified and contacted unauthorized attachers and educated them on the application requirements for receiving an attachment license. The audit and attachment records allowed the Company to appropriately back bill attachers up to five years, bill a percentage of the survey costs to the attachers, and improve the Company's business process. Additionally, when the Company performs normal day-to-day design and discovers unauthorized attachments they are investigated, brought into compliance and billed appropriately. Overloaded poles with NESC violations are brought up to compliance at the expense of the unauthorized attachers through make ready charges. Early detection

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<sup>50</sup> Id.

<sup>51</sup> National Grid April 19, 2012 Response at page 4.

through education and inventorying prevents unauthorized attachments and increases public safety.

After reviewing its “Make-Ready” process, the Company determined that it could do a better job communicating with its municipal counterparts. Therefore, going forward, on an annual basis, the Company will provide the municipalities in its service territory with educational and contact information concerning how to safely attach to National Grid’s facilities.

## **2. Pre-Storm Planning**

### **a. Predicting Storm Damage**

#### **PowerServices’ Recommendation:**

National Grid needs to improve its storm damage prediction processes. Additional weather forecasts should be considered when evaluating future weather conditions to improve accuracy. National Grid should implement a process that better utilizes the outside support of a weather analyst to evaluate forecast conditions and provide guidance whenever expected conditions could warrant an EEP Level 4 or 5 emergency response. During the anticipation phase preceding the storm event, National Grid’s interpretation of the storm’s relative strength and impact from a change in tracking undershot the event. Furthermore, for hurricanes or tropical storms which provide significant time for planning, National Grid needs complete and adequate scenario planning incorporated into its processes and documentation.<sup>52</sup>

#### **Company’s Response:**

National Grid does not agree with this recommendation for the reasons explained below. It also disagrees that its interpretation of the storm’s relative strength and impact from a change in tracking undershot the event, as Mr. Booth suggests. Indeed, the Company did anticipate and prepare for a major impact event.

First, the Company already considers a variety of weather forecasts in evaluating future weather conditions and it did so prior to

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<sup>52</sup> Id. at pages 52-53.

as well as during Irene. Additionally, Telvent, the Company's weather service provider, monitors several widely-used meteorological models. It also provides the Company with a professional interpretation of the potential impact of the event based upon these models.

Second, the Regional Control Center ("RCC") in Northborough continuously monitors various weather forecasts as a normal course of business. Additionally, National Grid hires Telvent to provide forecast updates at 6:00 a.m., 1:00 p.m., and 7:30 p.m. on a daily basis and to provide more in-depth analysis upon request.

Finally, when the RCC identifies a weather forecast that has the potential of disrupting electrical system operations, the Company holds an executive level conference call, during which a Telvent forecaster provides a forecast and answers questions relating to that forecast. Depending on the severity of the forecast, the executive team will decide whether to appoint an incident commander and initiate the emergency response plan.

*PowerServices' Recommendation:*

Prediction tools should be developed that consider storm damage history, operational capability, and susceptibility to damage to determine approximate crew requirements based upon forecast conditions. The ability of these new processes should also incorporate the ability to scale resources based upon the duration of the event. National Grid's planning and response management ultimately considered a 3-day event restoration window for Hurricane Irene was most likely. This underestimate in preparedness planning undoubtedly created a bottleneck later in the restoration process as additional resources were needed. Furthermore, adequate plans will outline the alternative resources for materials, crews, and support services well outside of the customary area of availability.<sup>53</sup>

*Company's Response:*

National Grid is investigating the development of a modeling tool that will enhance the Company's emergency response planning by projecting the locations and intensity of damage, and estimating staffing levels required to respond to a major weather event in Rhode Island.

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<sup>53</sup> Id. at page 53.

b. Activation of EEP

PowerServices' Recommendation:

National Grid did initiate its EEP processes preceding the storm event. However, the corporate storm response management team was not fully integrated into the restoration process. National Grid should implement the Strategic Response Team ("SRT") as clearly provided for in the EEP process and can be invoked as listed in the new "US Strategic Response Plan" ("SRP") initiated in June of 2011.<sup>54</sup>

Company's Response:

The Company does not agree with Mr. Booth's characterization of its SRT. As indicated in the National Grid April 19, 2012 Response, several of the core members of the SRT and expanded team members were engaged during Irene. The SRT is the entity that activates the System Incident Command Structure ("ICS"), and the System ICS subsequently activates the regional/branch incident commanders, as required. Ellen S. Smith, Executive Vice President and Chief Operations Officer, is the SRT chair and the incident commander for Rhode Island, and was responsible for keeping the entire SRT informed during Irene. Also, Timothy F. Horan, President for Rhode Island, is a member of the SRT and was present in Rhode Island for the entire week during the storm. Mr. Horan was in contact with other members of the SRT and these members were involved with Rhode Island concerns at various times during the restoration. The purpose of the SRT is to serve in an advisory role prior to an event, providing overall corporate strategic advice to the incident commander. It is not necessary to formally activate the SRT to receive the benefits of this group. SRT members were at the Northborough EOC throughout the storm and were included in all storm-related meetings to provide advice and direction as needed. Nonetheless, National Grid commits to reviewing the need for official activation of the SRT in each future event and will activate the SRT when appropriate.

c. Mobilization

PowerServices' Recommendation:

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<sup>54</sup> Id. at pages 53-54.

National Grid needs to evaluate and improve its processes in procuring additional restoration resources. During the anticipation phase, National Grid did participate in NEMAG conference calls. However, these activities did not guarantee or establish significant crews for National Grid until well into the restoration process. National Grid needs to establish further mutual aide agreements with various organizations such as NEPPA to take advantage of their 74 member utilities, surrounding cooperation utilities in Vermont, Maine, New Hampshire, New York, and the New York Power Authority. National Grid should also contract with the larger utility contractors in the Southeast and Midwest to be able to place their personnel and equipment on various levels of standby.<sup>55</sup>

*Company's Response:*

National Grid agrees with Mr. Booth's general recommendation concerning the procurement of additional restoration resources, and the Company has already taken steps to address these concerns. As noted in the National Grid April 19, 2012 Response, the Company is in the process of implementing certain initiatives to improve its level of preparedness for future storm events, which includes reaching outside of the Company's traditional resources as follows:

- The Company has been expanding relations with line contractors based outside of the Northeast and Eastern Coast Regions. This effort is intended to provide additional sources of restoration crews in the future. The Company has issued an RFP, and of the 83 vendors that received the RFP, a total of 65 companies have responded with complete bids and the Company continues to work with the remaining companies to obtain bids or gather missing information to complete the bid. A second RFP is being issued to eight new suppliers and eight suppliers who did not respond to the first RFP.
- The Company is working to create standardized purchase orders and rates for contractor crews to mobilize contractor crews faster. This will minimize the time lost to negotiations following storm events and will allow for more rapid deployment of crews.
- The Company has held several exploratory meetings with large contracting firms to explore potential strategic relationships and will

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<sup>55</sup> Id. at page 54.

continue to develop the contracting strategy and plan follow up meetings as appropriate.

- The Company is already a member of two Regional Mutual Assistance Groups – New England Mutual Assistance Group (“NEMAG”) and New York Mutual Assistance Group (“NYMAG”). The Company is collaborating with Electric Edison Institute and the mutual assistance groups to identify improvements and document processes involved in expanding Mutual Assistance requests outside of the Regional Mutual Assistance Groups. The process for sharing resources with municipal electric utilities has not been formalized because NEPPA has elected not to join either Regional Mutual Assistance Group.

PowerServices’ Recommendation:

National Grid has a serious deficiency in digger/derrick line trucks in Rhode Island. One of the reasons is that National Grid probably has not been replacing a suitable number of poles. PowerServices compared the State of Rhode Island to other similar sized utilities. Jacksonville Electric Authority (JEA) in Florida is a similar physical and electric load size to Rhode Island. JEA maintains 26 digger/derrick line trucks compared to the 10 that National Grid had available in Rhode Island before the Irene restoration. Similar to the State of Florida’s electric structure hardening requirements, the RIPUC should consider adopting a mandate to have each distribution pole tested on an eight year cycle. The reports from these pole tests will produce a list of danger poles and marginal poles. Danger poles should be changed immediately and marginal poles should be changed within the next twelve months. Because this pole work would be continuing, National Grid should plan to change them with local internal resources. A larger compliment of digger/derrick line trucks will be required to address pole replacements within Rhode Island.<sup>56</sup>

Company’s Response:

The Company’s disagrees with the assertion that it has a serious deficiency in digger/derrick line trucks in Rhode Island, or that it has not been replacing a suitable number of poles. The fleet of digger trucks that National Grid maintains has been adequate for the Company’s pole setting and maintenance work for the past 15 years. During peak construction periods, the Company supplements the fleet

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<sup>56</sup> Id. at pages 54-55.

with rental diggers, and during storms, the Company has had success with contractors that supply diggers during restoration work.

Regarding pole replacements, in the most recent Infrastructure Safety and Reliability plan, Mr. Booth recommended reducing the I&M, which would include pole replacements, by 50%, or \$1.5 million. As stated in Section II.A.1, pages 4-5 of this Supplemental Response, per the Company's I&M Program, distribution poles are inspected on a six-year cycle, and transmission poles are inspected on a five-year cycle (with additional ground line circumference evaluations on a ten-year cycle.) In short, the Company believes that its current I&M programs are adequate and does not agree that a mandated program of testing on an eight-year cycle is necessary. However, as discussed in Section II.A.1, page 5 of this Supplemental Response, pole condition on the distribution system is assessed by visual inspections. The Company is currently investigating technology that could be used to perform non-destructive testing, which would quantify the percentage of remaining pole strength.

### **3. Storm Restoration Response**

#### **a. Restoration Priority**

##### *Power Services' Recommendation:*

PowerServices suggests the following restoration priority:

i. Personnel would be dispatched from their local service areas to outages based on:

- (1) Restoring transmission/sub-transmission
- (2) Restoring substation power supply
- (3) Restoring circuits
- (4) Restoring major taps
- (5) Restoring minor taps
- (6) Restoring individual customers

*Note: This process will naturally limit the effects of cold load pick up suddenly overloading a line section.<sup>57</sup>*

##### *Company Response:*

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<sup>57</sup> Id. at pages 55-56.

The Company generally agrees with this recommendation. In fact, as detailed in the Company's EEP, the Company's approach to storm restoration is currently in alignment with and prioritized in a fashion similar to the above recommendation. The Company understands that before it restores customers, it must first restore transmission lines and substations. In cases where transmission or substation restoration is delayed, the Company will in parallel provide resources to areas that it can restore and which do not have supply issues.

PowerServices' Recommendation:

ii. The highest priority should be given to electric circuits serving electric loads critical to health, environment, and commerce.

- (1) Hospitals, Water Plants, and Sewer Plants
- (2) Traffic signals at major intersections, toll booths, guarded railway crossings, and movable bridges.
- (3) Industrial Centers, Ports, Commercial Centers, Farms<sup>58</sup>

Company Response:

The Company agrees with the part of this recommendation that provides that highest priority should be given to electric circuits serving electric loads critical to health and the environment. While the Company does not specifically prioritize commerce above general residential load, a significant amount of commerce is served from the main line of the feeder and three phase areas, which are prioritized before side taps as discussed above. The Company prioritizes restoration according to its internal feeder priority list, which is developed based on an analysis of the customer base on the feeder. Highest priority feeders include those with hospitals, pumping stations, public safety, and police/ fire. As described in the Company's EEP, the Company considers many factors when prioritizing the hundreds of distribution circuits that may have to be re-energized after a major event. The factors include, but are not limited to: critical facilities located on the circuit, location of response personnel, types and severity of damage, requests from the State Emergency Response Centers (typically road openings), requests from municipal officials, and requests from other agencies such as the Red Cross.

PowerServices' Recommendation:

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<sup>58</sup> Id. at page 56.

iii. National Grid should work with local agencies to set up care shelters for critical need customers. The centers should have backup generators with food, water, and oxygen. The first communications before the storm arrives would be to communicate with critical care customers the need to relocate to a shelter.<sup>59</sup>

Company Response:

Currently, through RIEMA, National Grid works with local agencies through the overall State Response. It also works with other agencies such as the American Red Cross and the United Way of Rhode Island. However, the Company itself does not set up shelters for critical need customers, and does not believe it should set up shelters, as this is the role for RIEMA, the Red Cross, and local agencies. The Company does attempt to contact identified life support customers to inform them of the scope of the interruption and the restoration forecast. If a customer cannot be reached, the Company attempts to make contact at a third party number if that information is available.

PowerServices Recommendation:

iv. The first activities after the storm would be to isolate effective areas to be able to get the substations and then circuit main lines back on. The initial phase of storm damage evaluation can take place as experienced crews are dispatched to isolate switches and tap lines. Dispatching construction crews should not wait upon damage assessment but should be a part of damage assessment.<sup>60</sup>

Company Response:

The Company agrees with this recommendation and currently operates in this fashion. Notably, the Company does not wait for damage appraisal results prior to dispatching available crews to restoration activities. Instead, crews are assigned work based on the need to maintain public safety and based on priority restoration utilizing the internal feeder priority list described previously in Section II.A.3.a (ii), page 14 of this Supplemental Response. Crews begin restoration on the feeders to which they are dispatched, prioritizing the mainline and critical care customers. In addition, crews conduct

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<sup>59</sup> Id.

<sup>60</sup> Id.

damage appraisal in parallel with restoration. Generally, damage appraisal is downstream of the line crews assessing damage so that total damage can be assessed to allow for resource planning and determining estimated restoration times.

PowerServices' Recommendation:

v. Electric system planning should consider this priority list when scheduling rebuilding lines and facilities. The highest priority circuits should be constructed with back up loop feeds to assure these can be restored first.<sup>61</sup>

Company Response:

The Company's distribution planning criteria evaluates the amount of load at risk during contingencies. In addition, the Company installs load break switches in several locations along feeder routes to provide flexibility for ties to adjacent feeders and to segregate and reconfigure the feeder effectively to isolated damaged areas. This allows for the restoration of customers in unaffected areas utilizing a "switch before fix" restoration philosophy. In addition, the Company also offers a second feeder service tariff for those customers who would like the ability to transfer their load automatically between two sources should one become unavailable.

b. Damage Assessment

Power Services' Recommendation:

An inefficient damage assessment process can be effectively a bottleneck in the storm restoration process. Typically, the main forces of construction crews will not be effectively dispatched until the assessment results are analyzed and processed. National Grid should take additional steps to improve the time required to complete Phase 1 and 2 damage assessments.

i. Analyze, process map, and evaluate methods that would streamline all areas within the Damage Assessment process.

ii. Insure that the processes and systems are scalable to manage the volume of information in a major event.

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<sup>61</sup> Id.

iii. National Grid needs to increase the frequency of refresher training for damage assessors and wires down personnel to twice per year.<sup>62</sup>

Company Response:

The Company refers the Division to the National Grid April 19, 2012 Response for the Company's position on this recommendation.<sup>63</sup> In addition, the Company provides the additional response below.

As stated previously in this Supplemental Response, the Company does not wait for damage appraisal results prior to dispatching available crews to restoration activities. Nonetheless, the Company has completed a process review of its damage appraisal processes and personnel storm assignments. The Company has added additional roles and personnel to the damage assessment process, making it more scalable. Also, the Company has communicated assignments to personnel and is currently developing appropriate training. The Company believes that a frequency of once per year is appropriate for the refresher training for Damage Assessment. While the Company believes that it has made improvements to its Damage Assessment processes, it continues to consider process and technology enhancements that could further streamline its processes.

c. Technology/Communications

PowerServices' Recommendation:

National Grid should evaluate all technology and communication systems that are currently employed as part of the outage process. National Grid experienced performance issues during Irene that hindered timely and accurate outage information and Estimated Time of Restoration ("ETR's") to National Grid employees, local government representatives, and electric customers. Part of this evaluation should include supporting internal and external information delivery from the system incidents during both a centralized outage response and a decentralized response. Technology systems should have access to backup and recovery options that will allow branch divisions to operate during system incidents. During Irene many of the

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<sup>62</sup> Id. at page 57.

<sup>63</sup> See National Grid April 19, 2012 Response at pages 6-7.

technology issues encountered were from the inability of the centralized systems to handle the scale of the information requests.<sup>64</sup>

Company Response:

National Grid will further review the current technology and communications systems that support the outage process. Because of the complexity of the end- to- end interfaces between systems, the Company expects that the reviews and any subsequent required actions will take 12 to 18 months to implement based on the following schedule:

- Initial reviews (2-4 months):
  1. Conduct analysis to decentralize some applications not 100% essential to the outage management architecture.
  2. Design architecture for ability to scale for magnitude of event.
- Implementation (8-12 months):
  1. Upgrade and/or modify architecture based on findings.
  2. Implement routine stress testing against new architecture to ensure it continues to support the targeted magnitude.

d. Emergency Preparedness Plan

PowerServices' Recommendation:

National Grid's EEP should be sufficiently comprehensive and specific to use as a handbook during any electric system emergency. Develop a pocket guide that can be distributed to each storm participant. The guide should define the management process, positions, and organization structure used to prepare for, plan, and respond to incident conditions. The objective of the guide would be to give employees specific guidance in a concise format to aid in responding to all sizes and types of events.<sup>65</sup>

Company Response:

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<sup>64</sup> Id. at pages 57-58.

<sup>65</sup> Id. at page 58.

The Company does not agree with this recommendation. As explained in the National Grid April 19, 2012 Response, the EEP is intended to be a high-level tactical document, not an operational field guide for local service personnel as Mr. Booth suggests. The Company's training and drill procedures are intended to provide field operational personnel with the specific guidance and appropriate information that is required to execute their individual storm assignments.

Moreover, all employees involved in public safety and restoration work during an event have access to the Company's standard operating procedures, which provides specific guidance regarding the work that is necessary to respond to any type of event. The Company does not believe it is appropriate to include this level of operational information regarding its operating procedures in the EEP.

*PowerServices' Recommendation:*

National Grid should review the response levels in the emergency plans to determine whether to modify or add a response level for an event the severity of Irene or greater. The current EEP's maximum event level was eclipsed by the number of outages created within the region by Irene, for Rhode Island, the outages totaled nearly 360,000 interruptions, approximately 75% of the customers.<sup>66</sup>

*Company Response:*

National Grid does not agree with this recommendation. The incident classification levels described in the EEP do, in fact, include preparation for an incident on the magnitude of Irene, as well as procedures to decentralize and manage distribution system recovery in the local service units. For example, incident classification level 5 includes any restoration that affects greater than 9% and up to 100% of the customer base and which is expected to last more than 72 hours. The expected duration of the event is important to consider in addition to the number of customers interrupted. The nature of the outages, whether the matter involves transmission or distribution, and the extent of the damage will cause variation in the impact and duration of the event not solely captured by the number of customers interrupted. The EEP is intended to cover all situations and provide a flexible framework for all events. Furthermore, the EEP describes a procedure

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<sup>66</sup> Id. at page 58.

for decentralization to the substation level, which is typically considered the most localized response organization in the industry.

The EEP also incorporates, by reference, the Company's SRP, which presents a scalable approach to storm events based upon the type, severity, and impact, and allows more information to be available to management as the event unfolds.

*PowerServices' Recommendation:*

National Grid needs to implement specific operational plans that consider and address all local offices (branch, wires down, etc), staging sites, and material yards based upon the increased local area restoration efforts. The requirements necessary to adequately operate each type of site needs to be evaluated and addressed as needed. Support logistics, material inventory, operations, and fleet all need to consider worst-case scenarios for dealing with restorations on the scale created by Irene. These plans would be in concert with EEP; however, these specific plans would need to be updated at least quarterly.<sup>67</sup>

*Company Response:*

The Company agrees with this recommendation. As part of its own After Action Review ("AAR") process, the Company has begun an end-to-end Emergency Planning and Response review. At this time, the Company has identified process owners for the most critical storm response processes. The process owner's role is separate and distinct from the roles in the Company's ICS command structure in the EEP. These process owners have accountability for implementing specific operational procedures, process improvement initiatives, and implementation of lessons learned. Each of the process owners has appointed an employee within their respective departments to lead the effort to review in detail staffing plans, training requirements, and drill plans for each process. The Company will update these plans and processes as needed but these updates may not take place on a quarterly basis. The following individuals have been assigned responsibility to oversee the review of each critical process:

- **Overall end-to-end responsibility:**  
Chief Operating Officer
  
- **Response Process Owners:**

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<sup>67</sup> Id. at pages 58-59.

Perform Damage Assessment - VP Engineering  
Secure Resources - VP Project Management & Construction  
Manage Logistics - VP Operations Support  
Complete Restoration - VP New England Electric Operations

• **Customer Satisfaction Process Owners:**

Ensure Public Safety: Director, Operations Safety  
Provide accurate ETRs: VP, New England Electric Operations  
Respond to Wires Down: VP, Control Center Operations  
Manage Government Relations: Director, Government Affairs  
Perform Customer Outreach: VP, Customer Energy Solutions

PowerServices' Recommendation:

National Grid's EEP should contain specific scenarios for restoration in Rhode Island. Efficient restoration of distribution outages is best managed by local service areas. The benefit would be that resources that are already in the area and familiar with the area would know that they are assigned to their home area for a storm recovery event. The local service area size should be based on the number of customers and number of circuits that can be reasonably managed in an Irene type outage or severe snow or ice storm. Also, the management team size should be limited by the number of crews they can reasonably manage. In the case of Irene the Branch Director for Rhode Island was responsible for 78 bucket trucks, ten line trucks, and 378 other vehicles. A single branch office directing the recovery could not possibly dispatch and understand the location and activity of these crews throughout the entire State of Rhode Island. The large number of outage events and the large number of crews would lead to a lot of standby time for the crews and inefficient dispatching. The objective in the local service area management approach is to put as many people as possible working on the various outage incidents that restores service to the greatest numbers of customers the fastest. Manpower in standby or while traveling is not effective in meeting this goal. Therefore, the outage management centers need to be localized to minimize the stand-by time and travel. Pictures of mass truck parks are impressive but are inherently inefficient.<sup>68</sup>

Company Response:

The Company agrees with the statement that manpower in standby or traveling are not effective in meeting the goal of restoring

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<sup>68</sup> Id. at 59-60.

service to the greatest numbers of customers in the fastest way. The Company's EEP, however, already includes a scenario for localized restoration. The EEP describes a procedure for decentralization to the substation level, which is typically considered the most localized response organization in the industry. This procedure is intended to be universal and applicable to any geographical area, including Rhode Island.

Mr. Booth implies that the Rhode Island branch director was directly responsible for supervising "78 bucket trucks, ten line trucks, and 378 other vehicles;" however, the branch director had a support team consisting of an Operations Coordinator, Storm Room team, Wires Down team, as well as a number of field supervisors who are responsible for managing the crews based on the direction given by the branch director.

PowerServices' Recommendation:

National Grid's EEP should make provisions for the entire National Grid service territory to be divided into local service areas sufficiently small that several persons have local knowledge of the streets, feeders, and substations and the following:

- i. Circuit switching locations
- ii. Feeder protective device locations
- iii. Feeder routing
- iv. Familiar with circuit voltage, conductor size and loading characteristics
- v. Familiar with weak points such as old and/or small conductor
- vi. At least one of these knowledgeable individuals needs to be the local area manager or have someone knowledgeable available to advise the local area manager during the restoration process.<sup>69</sup>

Company Response:

National Grid believes that its EEP already provides for the service territory to be divided into sufficiently small local service areas. And, as previously discussed, the EEP describes a procedure for decentralization to the substation level, which is typically considered the most localized response organization in the industry. This procedure, known as Substations Decentralized Operations, is employed when the Branch Director or Incident Commander believes

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<sup>69</sup> Id. at 60-61.

it is necessary. During this type of response, outages are worked by assigning whole feeders or substation areas to a task force group. The group constitutes an emergency response team at a localized level and would consist of necessary supervision, line and tree crews, and support personnel to work without outside direction and to restore service according to established restoration priorities.

The leadership in a given service territory, as well as the internal crews and supervisors, are typically local and have detailed expertise and knowledge of the items above. During an event the magnitude of Irene, however, it is necessary to supplement local resources with resources from outside the geographical area and such outside resources may not have this knowledge.

*PowerServices' Additional Recommendations Concerning the EEP:*

PowerServices also makes the following recommendations concerning the EEP:

- The EEP should contain strategies to recover from any problem faced during the emergency. For example: If the communications system fails, how will information be passed to protect employees when a line section is re-energized? When the substation batteries fail what source of power is available to re-energize the system?<sup>70</sup>
- The EEP should contain precise strategies for facing various scenarios of damage to the electric system including individual major pieces of equipment to various intensities of system damage.<sup>71</sup>
- The EEP should contain local power company facility maps and contact information.<sup>72</sup>
- The EEP should contain special safety instructions to be used during the recovery period including LOCK/OUT-TAG/OUT. With numerous instances of lines laying on the ground and multiple crews working on lines the standard rule should be to work behind a visible open point with the immediate system grounded. During the process of re-energizing a line section there is a brief period when the grounds are removed and the protective device or switch used to re-energize the line. Knowledge of where the section being energized feeds is of

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<sup>70</sup> Id. at page 61.

<sup>71</sup> Id. at page 61.

<sup>72</sup> Id.

paramount importance. However, communicating with the crews working in the area to insure that they are in the clear is even more important to protect crews and the public. This process falls under a written LOCK/OUT-TAG/OUT scheme that all personnel involved in the recovery must understand and follow.<sup>73</sup>

- Irene involved mass circuit outages. The first step in the distribution system process is to recover and re-energize circuits quickly. Therefore, the first exercise toward restoration should be to travel each main line of each circuit, record the physical damage, and isolate each switch point and protective device tap. The open points need to be marked in such a way to let other repair workers know that the open point is dedicated to future work and not to close it. That way, the main trunk of the feeder can be re-energized when the substation is energized and the main trunk is free of defects.<sup>74</sup>

Company Responses:

The Company responds to these recommendations as follows:

- National Grid does not agree with PowerServices' recommendations. The EEP is intended to be a high-level, tactical document that is adaptable to all hazards and situations and scalable for various types of system damage. It is neither feasible nor appropriate to include in the EEP strategies to recover from any type of problem encountered during emergencies. The Company maintains business continuity plans to address issues such as communications system failures. Additionally, scenarios such as failed batteries are a consideration during substation design.
- The EEP is not intended to be used as a field handbook. Moreover, electrical system assets are continuously upgraded and modified and the Company maintains EMS and GIS systems to model the electrical assets. Field supervisors have access to the GIS system through mobile laptops in their trucks. Any attempt to map the electrical system in the EEP would result in outdated facility maps and contact information, which would pose a safety hazard as well as potential security concerns. Additionally, under its newly-developed procedures, the Company provides local area maps to its community liaisons to facilitate communication and alignment of priorities with local response personnel.

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<sup>73</sup> Id. at pages 61-62.

<sup>74</sup> Id. at page 62.

- The Company utilizes LOCK/OUT-TAG/OUT (“LO/TO”) procedures designated as Clearance and Control (“C&C”) procedures with authorized and qualified workers in the situations discussed. The Company’s workers are tested annually to ensure workers understand and demonstrate competency. The Company’s C&C procedures are system operator based and meet or exceed the LO/TO process. These procedures are strictly enforced at all times, including during storm restoration. Importantly, these procedures are separate and distinct from the EEP, and the Company does not agree with Mr. Booth’s recommendation that these procedures be included in the EEP.
- The Company regards the safety of its employees, contractors, and crews as paramount, and provides safety messaging prior to all meetings and conducts safety briefings prior to beginning any work.
- As previously discussed on pages 11 through 14 of this Supplemental Response, the Company does not wait for damage appraisal results prior to dispatching available crews to restoration activities. Crews begin restoration on the feeders to which they are dispatched, prioritizing the mainline restoration. Re-energization of the sections of the feeder is in accordance with the Company’s Clearance and Control Procedures. The purpose of the Phase 1 Patrols in the Company’s damage assessment process is to travel the mainline of circuits with significant customer outages.

*PowerServices’ Recommendation:*

National Grid should create or expand partnerships with local and State emergency managers. To further strengthen these relationships, management-level personnel should be authorized to make operational decisions and work routinely with local and State emergency service agencies. National Grid operational personnel need to make contact with their counterparts in local government public works and transportation agencies. The purpose is to initiate a joint planning process among the utility and public sectors. National Grid should also make every effort to improve communication links with emergency service agencies by integrating the following into the EEP and restoration process:

- i. Contact information for local emergency and governmental authorities.<sup>75</sup>

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<sup>75</sup> Id. at pages 62-63.

Company Response:

National Grid has expanded its partnerships in Emergency Response to include local EMA's in addition to the Company's State partnership with RIEMA. As part of the expanded partnerships, the Company will have Community Liaisons assigned to each local EOC to help coordinate restoration and communications. Additionally, National Grid has updated contact information for all the cities and towns in Rhode Island. This information was update in 2012. As part of the Company's new Community Liaison program, the Company will meet with each city and town to review this information as well as their critical priorities and how it is served from the National Grid distribution system.

PowerServices' Recommendation:

ii. National Grid should participate with local authorities with mutual aide support agreements.<sup>76</sup>

Company Response:

National Grid is working with Pascoag Utility District on a mutual aide support agreement as a result of the Irene recommendations.

PowerServices' Recommendation:

iii A National Grid representative should accompany each local emergency service vehicle throughout the main traffic arteries to insure that the first responders do not face any electrical hazards. When trees are down in streets local governments will be clearing the streets as quickly as possible. By coordinating with the local government, National Grid might use their heavy equipment to clear large trees from power lines saving time and expense in the restoration effort.<sup>77</sup>

Company Response:

National Grid is implementing a Regional Zone plan in coordination with the National Guard and State Police to help clear streets as soon as possible to allow access for first responders. The

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<sup>76</sup> Id. at page 63.

<sup>77</sup> Id. at page 63.

Regional Zones will be located throughout the State at State Police barracks and will have dedicated National Grid personnel to work with the local departments of public works and the State Department of Transportation to clear roads and highways for first responders.

PowerServices' Recommendation:

iv. National Grid should provide training to local emergency personnel and utility workers to recognize the hazards of a downed power line or a cablevision or phone line.<sup>78</sup>

Company Response:

National Grid already meets annually with local emergency personnel and safety with downed power lines is a topic of discussion at these meetings. Additionally, the Company provides electrical hazard awareness materials to local emergency personnel upon request.

PowerServices' Recommendation:

v. National Grid in concert with the local governments should establish a generator policy so that lines down might not be energized by a generator back feed.<sup>79</sup>

Company Response:

In the State of Rhode Island, the installation of emergency generators must be compliant with the National Electric Code ("NEC"), and the municipal Electrical Inspectors have jurisdiction to enforce the NEC and approve the proper installation of emergency generation. Since the installation of these generators is inspected and approved by the municipal Electrical Inspectors, the State of Rhode Island is better positioned to develop an emergency generation policy to ensure consistency across all local jurisdictions. National Grid would welcome, however, the implementation of such a policy and would work with the State on the development of such a policy if requested.

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<sup>78</sup> Id. at 63.

<sup>79</sup> Id. at 63.

PowerServices' Recommendation:

vi. National Grid should cooperate with local authorities in establishing a shelter where at risk residents can have power for medical devices. Thereby, National Grid can direct high risk customers to these shelters while awaiting system recovery.<sup>80</sup>

Company Response:

The Company refers the Division to its response to PowerServices' recommendation in (i), above (*Contact information for local emergency and governmental*) at page 23.

PowerServices' Recommendation:

vii. Lists of local government facilities with critical power needs:

- i. Critical traffic intersections
- ii. Critical pumping stations (water, sewer, and storm sewer)
- iii. Critical government facilities and shelters<sup>81</sup>

Company Response:

In 2012, National Grid community liaisons met with local government officials to review their critical facilities and update the Company's feeder priority lists for all the cities and towns in Rhode Island. As part of the Company's new community liaison meetings, the Company has educated the cities and towns on the levels, 1, 2, and 3, of the critical facilities on how it restores its feeders based on this information. A community liaison will be stationed in the local EOC's to help communicate ETR's and coordinate restoration of these critical facilities.

**Company's Response to PowerServices' Recommendations To  
The Division (Booth Report, Page 64):**

**1. The Division should encourage and implement the following activities:**

PowerServices' Recommendation:

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<sup>80</sup> Id. at 63.

<sup>81</sup> Id. at 63-64.

Electric utilities in the State of Rhode Island should adopt mutual aid and assistance agreements with utilities in neighboring states including the electric municipal utilities.<sup>82</sup>

Company Response:

The Company refers the Division to its response in Section II.A.2.c (Mobilization) on page 11 of this Supplemental Response.

PowerServices' Recommendation:

In conjunction with the efforts of the Rhode Island Emergency Association (REMA), local governments should make agreements for mutual aid with each other, state department resources, and the private utilities. These parties should coordinate annual incident response drills to verify the effectiveness of these coordinated responses.<sup>83</sup>

Company Response:

National Grid already coordinates with RIEMA through its responsibilities with Emergency Support Function 12 - Energy. The Company invites RIEMA to its annual system storm drill.

PowerServices' Recommendation:

Require hourly utility reporting during major system outage events and a final comprehensive report should be filed within 90 days by National Grid similar to the requirements now mandated in the State of Massachusetts.<sup>84</sup>

Company Response:

The Company does informally provide outage reporting to the Division during major events. National Grid welcomes the opportunity to work proactively with the Division to formalize its event-reporting requirements.

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<sup>82</sup> Id. at 64.

<sup>83</sup> Id.

<sup>84</sup> Id. at 64.

## Company's Sur-response to Division May 16, 2012 Response

### **a. System Reliability**

#### 1. Storm Hardening

##### PowerServices' Recommendation:

Mr. Booth states that "Our comments relative to the feeder hardening program point to whether the historical programs have had sufficient and appropriate focus on the systems' ability to perform under storm conditions, including ice storms, snow storms, and tropical winds storms. To the extent that the prior programs have been deficient in these areas, and as the Company is embarking on a new inspection and maintenance program processes, these issues should be incorporated." He further states that "[t]he level of pole failures and other failures that we have seen require a level of improved post-storm assessment to clearly define whether they are due to tree failures versus other line equipment...."<sup>85</sup>

##### Company Response:

The Company continues to believe that tree damage accounted for a significant portion of the damage to the distribution system, as discussed in the National Grid April 19, 2012 Response.<sup>86</sup> While the Feeder Hardening Program was not intended to address worse case scenario storm events as described in the Booth Report, the Company does recognize Mr. Booth's assertions that the Company should focus further efforts on the system's ability to perform under storm conditions.

Nonetheless, the Company does not believe that the I&M Program is the right mechanism to do so. The Company is, however, developing a Minor Storm Strategy to address pockets on the distribution system that have experienced multiple minor storms over the past five years. The Company defines "Minor Storms" as occurring on days when the network experiences an exponentially greater number (between 1.5 and 2.5 Beta plus 3x the average number of events) of SAIDI minutes due to a weather event. The reliability impact to the network is moderate to serious on these storm days. Our approach will identify the most significantly affected areas on the system and evaluate interruption causes in those areas to

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<sup>85</sup> Division May 16, 2012 Response at pages 3, 4.

<sup>86</sup> See National Grid April 19, 2012 Response at pages 2-3.

develop specific storm hardening recommendations for those areas. Potential improvements could include replacing distribution line equipment, adding spacer cable or changing construction, additional tree trimming or hazard tree removal, or adding additional communication capability. The Company would consider such improvements as part of its annual ISR Plan, and would work collaboratively with the Division on inclusion of such a program in the ISR Plan.

The Company further believes that this analysis to evaluate the interruption causes in minor storms will be more efficient and effective method to improve our assessment of interruptions than a specific major event post-storm assessment on pole replacements as discussed in PowerServices' recommendation in Section II.A.1, page 6 of this Supplemental Response. The Company does document the replacement of poles and other capital equipment through a confirming work order process, but believes that requiring additional documentation on failure cause during the event from our field forces would interfere with the primary objective of restoring service to customers

## 2. Engineering Analysis and NESC Standards

### PowerServices' Recommendation:

Post-transmission structure failure analysis: Mr. Booth states that "prudent utility practice would be to perform a post-transmission structure failure analysis and . . . the Company's North American Electric Reliability Corporation ("NERC") documentation would indicate that a company under those standards would, in fact, perform a post-transmission structure failure analysis. The transmission structure clearly failed either due to a design flaw, an installation flaw, or a maintenance deficiency." He further states that "[f]rom a post-storm assessment and reliability standpoint, the Company has made no indication of any efforts to address the other pole structures in this transmission line that were constructed at the same time as this failure (30 years ago) using the same materials and maintenance standards."<sup>87</sup>

### Company Response:

The Company disagrees with Mr. Booth's findings regarding the major transmission structure failure highlighted in the Division's May 16, 2012 memo. While not required by NERC, the Company's

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<sup>87</sup> Division May 16, 2012 Response at pages 5-6.

practice is to investigate the failure of transmission structures. As previously acknowledged in the Company's response to Division 2-11, the pole that broke on the L14 transmission line was, inadvertently, not retained. This is because the Company's efforts were focused on restoring service following Irene.

An analysis of the L14 pole failure, provided as Attachment DIV 2-11-1, demonstrated that the pole did not fail due a design flaw, but the Company was unable to determine, with certainty, the cause of failure. That analysis stated "[g]iven that the failure occurred well above the ground line, decay seems unlikely. Fatigue stress on the pole due to repeated wind cycles may be possible. Acute mechanical damage due to woodpecker nesting or some other cause could also be possible." Mr. Booth's conclusion that "the transmission structure clearly failed either due to a design flaw, an installation flaw, or a maintenance deficiency" is incorrect and speculative.

Concerning the condition of other pole structures in the L14 line, the Company has a program to inspect all its wood poles at ten year intervals. These inspections were properly performed on the L14 line in accordance with that program. The poles were inspected during fiscal year 2001/02 (inspected in June 2001) and again during fiscal year 2011/12 (inspected in March 2012). During the most recent inspection, the Company identified two poles for replacement, and the process to make those replacements in accordance with the Company's established timeframes has been initiated.

PowerServices' Recommendation:

Third-party pole attachments: Mr. Booth states that " National Grid does not explain when in the process it realizes that (1) third party attachers did not follow the appropriate process, (2) what the Company does in those instances, or (3) how they quantify the magnitude of the issue."<sup>88</sup>

Company Response:

The Company refers the Division to pages 6-7, *supra*, of this Supplemental Response for the Company's response to this recommendation.

## **7. Discussions and Findings**

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<sup>88</sup> Id. at page 6.

As an initial finding, it appears that National Grid has already moved in the direction of adopting many of the recommendations enumerated in the PowerServices' Report. The Division accepts these actions by National Grid as a positive step toward improving the effectiveness of the Company's storm preparedness going forward. Yet, there does appear to still be much daylight between the parties on some key preparedness questions, primarily concerning system design, construction and maintenance issues. The particulars of these differences of opinion are discussed in much detail elsewhere in this Report and Order. With respect to these issues, National Grid has argued that the changes being recommended by the Advocacy Section are unnecessary expansions of industry standards and, if required to be implemented, very costly. As an example, National Grid relates that it would cost ratepayers between \$30 million to \$60 million just to implement the Booth Report's recommendation to upgrade the Company's transmission structures in Rhode Island. In contrast, the Advocacy Section has neither proven that any of National Grid's current practices violate any NESC requirements, that any other electric utilities have fully adopted the myriad recommendations being proposed by the Advocacy Section, nor has the Advocacy Section detailed how National Grid is expected to pay for all of the recommendations it is urging the Division to compel National Grid to accept. It is also noteworthy that the Advocacy Section has not disputed any of the cost claims made in the responses filed by the Company. Indeed, as the Advocacy Section declined a hearing on the merits concerning the respective positions

proffered in this docket, in effect, waiving its right to cross-examine the Company on its responses, the Division is left only with the “face-value” of the parties’ posited assertions on the various issues in dispute in this matter.

### Preparedness

The Division has carefully studied the preparedness-related recommendations offered by its Advocacy Section in this proceeding, as well as the comprehensive responses proffered by National Grid. In doing so, it has become abundantly clear that there are no clear and obvious reasons to explain why Tropical Storm Irene had such a destructive impact on National Grid’s electrical supply system in Rhode Island. Though the Advocacy Section maintains that National Grid’s level of preparedness was questionable, National Grid strongly refutes this claim.

The primary basis for the Advocacy Section’s assertion that National Grid was not properly prepared for Tropical Storm Irene is a declaration by PowerServices that its team did not “observe the degree of failure on other utility systems that was experienced in Rhode Island with wind speeds at the levels that occurred in Rhode Island...” (the transmission and distribution assets in issue, which were incapacitated during the storm, are detailed in the Report). To support this assertion, the Advocacy Section utilizes the PowerServices Report to suggest several causative factors. Chief among them, that National Grid’s downed poles suggested engineering design and construction insufficiencies and, further, that the poles were not being properly inspected and maintained.

National Grid, however, vehemently rejects this hypothesis. As an alternative explanation for the widespread electrical system failures, National Grid emphasizes that Tropical Storm Irene was a unique storm, with day-long sustained winds of 37 mph with gusts up to 83 mph. National Grid stresses that the 2-4 inches of rain that fell during the storm caused saturated soils, which created favorable conditions for “full tree failures.” In the end, National Grid largely blames tree damage for the outages and not system design, construction or maintenance insufficiencies.

To address the considerable number of transmission infrastructure failures witnessed after Tropical Storm Irene, the Advocacy Section argues that the Division should accept PowerServices’ recommendations for more frequent inspections of transmission and sub-transmission structures; and the hardening of such structures when they exist in proximity to coastlines. However, National Grid argues that these changes are unnecessary and extremely costly. The Company adamantly maintains that its current inspection practices are more than sufficient and that its construction standards and design practices meet or exceed the strength requirements imposed by the NESC.

Without the benefit of more information on the subject, the Division, at least in the short term, cannot agree to impose additional costs on National Grid’s ratepayers to fund transmission system upgrades and inspections that are not clearly prescribed under the NESC. In view of the tens of millions of dollars involved in this calculus, with no guarantees that such improvements would

prevent the magnitude of outages witnessed from another Irene, the Division finds that prudent regulatory practice dictates a more judicious approach to addressing these suggested policy changes. For this reason, the Division chooses to further scrutinize these proposals, both in the context of future rate cases before the Commission and through future storm preparation and damage assessment reports, infra.

The PowerServices Report also alleges preparedness deficiencies associated with: (1) post-storm analysis of failed poles, (2) faulty third-party pole attachments, (3) improper use of weather forecasting services, (4) the need to develop prediction tools that consider storm damage history and susceptibility to damage in order to optimize a determination of crew requirements, (5) the use of National Grid's Strategic Response Team (SRT), (6) and the process of procuring additional restoration resources, including additional digger/derrick line trucks.

National Grid, however, offers cogent responses to each of these critiques. Specifically, first, National Grid responded that it already investigates the failure of transmission structures; and that its distribution poles meet all NESC strength requirements, and that distribution pole failures due to tree damage do not necessitate a post-storm analysis. Next, though National Grid concedes that some joint-use parties have failed to follow the appropriate process for obtaining approval and licenses for their attachments to the Company's distribution poles, National Grid notes that since it conducted a complete survey of attachments in 2009, and discovered over 54,000 unauthorized attachments, it has taken

measures to better educate third-party attachers, including municipalities, on the application requirements for receiving an attachment license; and to better enforce those requirements by taking quick corrective action when violations are discovered. Next, National Grid states that it already considers a variety of weather forecasts when a storm is approaching, and that the Company's Regional Control Center in Northborough continuously monitors various weather forecasts as a normal course of business. National Grid next responds that it is currently investigating the development of a modeling tool that will enhance its emergency response planning by projecting the locations and intensity of damage, and estimating staffing levels required to respond to a major weather event. Regarding its SRT, National Grid stresses that the core members of the SRT were engaged during Irene. And, on the final preparedness point, although National Grid rejects the recommendation that it needs more line trucks; the Company agrees that it needs to improve its processes in procuring additional restoration crews from outside the Northeast and Eastern Coast Regions – and is in the process of doing so.

The Division accepts that National Grid already investigates the failure of transmission structures. However, National Grid was unclear on what this investigation entails. PowerServices is recommending that the Company develop a post-storm analysis process to correlate the downed poles' age, previous condition based on inspection information, and failure cause. The Division finds

this recommendation to be reasonable and cost-effective. The Division agrees that downed distribution poles should be included in this process as well.

Moving on, the record does reflect that National Grid may have been careless in the way it enforced its “Make Ready” policies prior to 2009, as evidenced by the great number of unauthorized pole attachments it discovered during a planned survey. However, the record also reflects that National Grid has, since completing the 2009 survey, introduced significant measures to rectify this problem. Based on the comprehensive survey (audit) completed, and the remedial steps that subsequently followed, the Division finds that it would be unnecessarily costly to compel the Company to further test distribution poles, as recommended in the Report.

The record reflects that National Grid already considers a variety of weather forecasts when a storm is approaching, and that the Company’s Regional Control Center in Northborough continuously monitors various weather forecasts as a normal course of business. Accordingly, the Division fails to understand the basis for the PowerServices’ recommendation that National Grid needs to seek additional weather forecasting services for guidance during storms. Furthermore, as the Company is adamant that it anticipated and prepared for a major storm, the Division is unable to accept the Report’s suggestion, without more evidence, that National Grid failed to link the quality of its weather forecasts with the severity potential of Irene. The Division must also accept National Grid’s current protocol for permitting its executive team the flexibility of appointing an incident

commander when the team determines that the forecast warrants such action. In sum, the Division finds insufficient support in the record to mandate any changes to this Company practice.

The Division finds that National Grid has undertaken steps, in conformance with a PowerServices' recommendation, to develop a "prediction" (modeling) tool that will enhance its emergency response planning. Such a tool can be used to better project the locations and intensity of damage, and can be used to better estimate staffing levels required to respond to a major weather event. National Grid is directed to report back to the Division within six (6) months from the issue date of this Report and Order with the details regarding this effort.

On the issue regarding National Grid's Strategic Response Team (SRT), the Company maintains that it is not necessary to activate the SRT to receive the benefits of this group. In support of this position, the Company notes that several of the SRT's members were at the Northborough EOC throughout the storm and were included in all storm-related meetings. However, the Company's response fails to identify when, and under what circumstances its SRT is actually activated. If not activated during Irene, then when is the right time? The Division believes that National Grid's restoration efforts in Rhode Island would have benefited from a quickly activated and completely engaged SRT. In view of this conclusion, the Division would urge National Grid to use its SRT more liberally during major storm events.

The Division accepts that National Grid is implementing a number of new initiatives designed to improve the Company's level of preparedness for future storms. These initiatives include expanding its restoration resources by adding crews from outside the region and creating standardized purchase orders and rates for mobilizing crews faster. National Grid is directed to report back to the Division within six (6) months from the issue date of this Report and Order with the details regarding this effort.

Finally, on the matter of whether the Company needs more digger/derrick line trucks, the Division finds insufficient evidence on the record to adopt the PowerServices' recommendation at this time. The Company argues that it does not need more line trucks, and when it does, it contracts for additional crews and trucks from out of state. However, as the Company has committed to augmenting its local crews with more contract crews from outside the region, the Division finds that it would be prudent to first examine this effort by the Company before taking any action compelling the Company to purchase more line trucks. Accordingly, as the Division has directed National Grid to report back to the Division within six (6) months from the issue date of this Report and Order with the details regarding its efforts to engage more restoration crews, supra, the Division will wait for that report before deciding whether to take any further action on the question of whether the Company needs to purchase additional line trucks.

## Restoration Response

On the question of restoration response, National Grid agrees with most of the recommendations contained in the PowerServices Report. As examples, National Grid generally agrees with the Report's recommendations on "restoration priority;" on the importance of working with local (and State) agencies to set up care shelters for critical need customers; on the need to isolate effective areas to be able to get substations and then circuit main lines back on; on constructing the Company's highest priority circuits with back up loop feeds to assure that these circuits can be restored first; on adding more personnel and training to the damage assessment process in order to make it more streamline and scalable; on reviewing the Company's technology and communications systems; and on the need to implement specific operational plans that consider and address all local offices, staging sites, and material yards based upon increased local area restoration efforts.

On the subject of National Grid's relationships with local and State emergency managers, the Company indicates that it already has expanded its partnerships in Emergency Response to include local EMA's in addition to the Company's partnership with RIEMA. National Grid relates that in the future it will utilize Community Liaisons in each locality to help coordinate restoration and communications. National Grid also states that it is working with the Pascoag

Utility District on a mutual aide support agreement as a result of some of the recommendations contained in the Report.

National Grid is also implementing a Regional Zone plan in coordination with the National Guard and State Police to assist in clearing streets after a major storm. The Company is also meeting annually with local emergency personnel to discuss proper procedures for dealing with downed power lines; and is providing electrical hazard awareness materials upon request from local officials. National Grid does, however, believe that generator policies (to prevent back feed problems) and the establishment of emergency shelters are issues better left to local authorities.

In view of the Company's general acceptance of the recommendations in the aforementioned areas, the Division finds that it will not be necessary at this time to impose any specific obligations on the Company. Instead, the Division will again direct National Grid to report back to the Division within six (6) months from the issue date of this Report and Order with the details regarding these cooperative efforts.

However, National Grid disagrees with all of the PowerServices Report's recommendations relative to the Company's EEP. In rejecting the recommendation to expand and convert the Company's EEP into a field handbook, National Grid explains that its EEP is "a high-level tactical document, not an operational field guide for local service personnel..." National Grid contends that it has adopted training and drill procedures for its field personnel

that provide a more suitable means of providing the appropriate information required to execute individual storm assignments.

Similarly, National Grid also disagrees with the Report's recommendation that the Company needs to add a response level to its EEP that would match the severity of Irene. National Grid asserts that its EEP already includes preparation for an incident like Irene, as well as procedures to decentralize and manage distribution system recovery in the local service units. National Grid adds that its EEP also incorporates the Company's SRP, which presents a scalable approach to storm events.

National Grid identified a number of additional disagreements with regard to recommendations concerning its EEP. First, though National Grid agrees that manpower in standby or traveling are not effective in meeting the goal of quickly restoring service, National Grid disagrees with the Report's recommendation that the Company's EEP needs to contain specific scenarios for restoration in Rhode Island. National Grid contends that its EEP already includes a scenario for localized restoration. National Grid argues that its EEP describes a procedure for decentralization to the substation level, which the Company describes as an industry standard, and which the Company argues is universal and applicable to any geographic area, including Rhode Island.

Lastly, National Grid contends that its EEP already provides for the service territory to be divided into sufficiently small local service areas, thereby expressing its disagreement with the contrary assertion contained in the Report.

National Grid contends that its Incident Commander already has this flexibility in the Company's existing EEP.

Significantly, with the limited information contained in the record, the Division is unable to seriously question the content in National Grid's EEP or the manner in which National Grid chooses to circulate its EEP to its personnel. The Company's EEP is clearly a managerial tool and must, for that reason, be afforded great deference by the Division. Generally, the Division must be mindful that an unwarranted invasion into a field reserved to management would be improper [See United Transit v. Nunes, 99 R.I. 513, 209 A.2d 222 (1965)]. The Division's broad regulatory powers do not include authority to dictate managerial policy [See Providence Water Supply Board v. PUC, 708 A.2d 537 (1998)]. Under the parameters established in the Providence Water case, the Division is permitted to take regulatory action in such cases only where the evidence abundantly demonstrates that regulatory inaction would result in an unjust and unreasonable burden on ratepayers. The Division finds insufficient evidence in this case to reach such a conclusion, and consequently, will not require National Grid to make any changes associated with its EEP.

#### Recommendations to the Division

PowerServices recommends that the Division encourage electric utilities in Rhode Island to adopt mutual aid and assistance agreements with utilities in neighboring states, including electric municipal utilities. National Grid has

expressed support for this recommendation and has already begun taking steps to expand relations with line contractors outside of the Northeast and Eastern Coast Regions. The details of those efforts are discussed herein. The Division finds the Company's response to this recommendation to represent a good faith effort, and will continue to monitor the Company in this regard, supra.

PowerServices also recommends that local governments and utilities work with the Rhode Island Emergency Management Agency in order to make agreements for mutual aid; and for the purpose of coordinating annual incident response drills to verify the effectiveness of these coordinated responses. In response to this suggestion, the Division notes that it actively participates with the State's public utilities in emergency preparedness activities including drills and training exercises. In emergency response and recovery events, the Division also staffs the RIEMA Emergency Operations Center to facilitate communications among National Grid, the Pascoag Utility District and the Block Island Power Company. Predicated on the Division's observations during these frequent activities, the Division believes that its regulated electric utilities are already chiefly compliant with this recommendation.

Additionally, PowerServices recommends that the Division require hourly utility reporting during major system outage events and a final comprehensive written report within 90 days. The Division notes that it is already the practice of National Grid to post its outage figures on an internet-based emergency

management platform (WebEOC) during major storm events, which is accessed by local, state, federal and private sector emergency responders. The frequency of the postings is typically determined by the needs of the situation, and ultimately the RIEMA Incident Commander. In a dynamic situation, these figures have been posted hourly. The Division finds this practice to be adequate and that no additional requirements are necessary. With respect, however, to the Report's recommendation for a final written report from National Grid within 90 days, the Division agrees that such a final report would be extremely valuable as a resource tool for overseeing the implementation of the preparedness enhancement measures that National Grid has identified and agreed to embrace in this docket. Accordingly, the Division directs National Grid to file such reports after major storm events.

As a final observation and directive, the Division has accepted National Grid's cost concerns relating to a number of the recommendations contained in the PowerServices Report. However, as the Division plans to study the efficaciousness and cost/benefit of these recommendations in the months and years ahead, the Division hereby instructs National Grid to provide a cost analysis for all of the recommendations contained in the Report that the Company has rejected on cost grounds. This cost analysis is to be submitted with the progress reports ordered herein, due in six (6) months.

## **8. Conclusion**

At the outset of this investigation, the Division announced that “...*the purpose of the review is to fully understand the reasons for the scope and duration of the outages; and to apply any and all lessons learned to future emergencies.*” From the record developed through this review, and the concomitant actions taken by National Grid, the Division believes that much has been accomplished. As a result of the Tropical Storm Irene experience and the reviews (internal and external) which followed, National Grid has acknowledged that its storm preparedness efforts were deficient in some cases and also that improvements can be effectuated in several other storm planning areas.

National Grid has agreed that it needs to do a better job with making arrangements for assistance from out-of-region line crews when the State is facing a storm whose path is following an Atlantic coastline approach. The Company has committed to making these changes and the Division will monitor the Company’s progress in this effort. Similarly, National Grid has committed to exploring and implementing a significant number of other changes and improvements, supra, which the Division will also track, and if necessary, address through further proceedings.

On the matter of National Grid’s transmission and sub-transmission structure and distribution pole inspection and maintenance protocols, the Division has determined that the rate implications of these recommendations contained in the PowerServices Report warrant additional study. Moreover, if these recommendations are to be adopted, a gradual phase-in approach will

likely be employed to mitigate the impact on future rates in order to prevent a rate-shock scenario for the Company's customers.

The Division has adopted some of the recommendations contained in the PowerServices Report for immediate implementation. The Division has also instructed National Grid to report back to the Division within six (6) months from the issue date of this Report and Order with respect to the progress made on the many storm planning changes discussed herein. After examining that report, the Division will determine whether any additional regulatory action will be necessary.

The Division has also directed National Grid to quantify the costs associated with the recommendations that National Grid has voiced cost concerns over. That cost analysis, also to be filed within six (6) months, will assist the Division in its future consideration of these recommendations.

Accordingly, it is

(20814) ORDERED:

That National Grid is hereby directed to comply with the findings contained herein.

Dated and Effective at Warwick, Rhode Island on November 20, 2012.

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APPROVED: \_\_\_\_\_

John Spirito, Jr., Esq.  
Hearing Officer

Thomas F. Ahern<sup>89</sup>  
Administrator

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<sup>89</sup> NOTE FROM THE ADMINISTRATOR: The instant docket highlights many areas where improvements can be achieved and develops a framework for future restoration efforts. It is apparent the utility's efforts undertaken in planning and responding to recent Hurricane Sandy were superior to those related to Tropical Storm Irene. Clearly, the issues discussed and debated in this docket assisted in the planning of future utility response to natural disasters. This is particularly evident in the utility's improved communications with stakeholders during this most recent event.

As a result of a settlement reached in a pending National Grid rate proceeding, the company has agreed to make an additional contribution to the storm fund, above the amount explicitly cited in the settlement cost of service, in an amount equal to any incremental legal, consulting or other costs that it incurred on its own behalf or on behalf of the Division related to the instant docket, *Review Of Preparedness And Restoration Efforts By The State's Electric Utility Companies Related to the Recent Damages Sustained in Tropical Storm Irene*.

It is important to note that the storm fund, and ratepayers, will benefit from these additional company credits to the fund that are over and above the amount included in the rate case settlement agreement and there will be no detrimental rate impact from these additional Company contributions. Further, this additional credit will be used to help replenish the storm fund, which, at present, has a negative fund balance.

The ways government and the private sector plan for, and respond to, emergencies must be an ongoing process that includes an honest discussion of issues related to each significant event. I view this docket as a worthwhile part of that dialogue.