

STATE OF NEW HAMPSHIRE  
BEFORE THE  
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
DIRECT TESTIMONY OF  
WILLIAM H. SMAGULA

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE  
RECONCILIATION OF ENERGY SERVICE AND STRANDED COSTS FOR  
CALENDAR YEAR 2011

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1 **I. Introduction**

2 **Q. Please state your name, position, employer and address.**

3 A. My name is William H. Smagula. I am Director of Generation for Public Service  
4 Company of New Hampshire, (PSNH), a subsidiary of Northeast Utilities (NU).  
5 My business address is 780 North Commercial Street, P.O. Box 330, Manchester,  
6 New Hampshire 03105.

7 **Q. Please provide a brief summary of your background.**

8 A. I received a Bachelor of Science in Mechanical Engineering from the University of  
9 New Hampshire and a Master of Science in Mechanical Engineering from  
10 Northeastern University. I have worked for Public Service Company of New  
11 Hampshire and then Northeast Utilities since 1978. I am a Registered Professional  
12 Engineer in the states of New Hampshire, Connecticut and Massachusetts. My  
13 duties have included Manager of Generation Training for the PSNH system,  
14 Station Manager - Merrimack Station, Steam Production Manager - PSNH,

1 Director Fossil Generation - The Connecticut Light and Power Company, and  
2 Director, Manage and Operate Services - Northeast Generation Services Company.  
3 In June 2001, I assumed the responsibilities of Director - PSNH Generation in  
4 New Hampshire.

5 **Q. Have you ever testified before this Commission?**

6 A. Yes. I have provided similar testimony in many previous Commission proceedings  
7 regarding the operation of PSNH's fossil-fired, biomass and hydroelectric  
8 generating plants.

9 **Q. Please describe your responsibilities as Director - PSNH Generation.**

10 A. In my present position, as Director - PSNH Generation, I am responsible for the  
11 operation and maintenance of PSNH's generating stations. I have responsibility  
12 for three fossil-fired, steam electric generating stations, nine hydroelectric  
13 generating stations, two remote combustion turbine/diesel generator sites and a  
14 biomass fueled boiler with the repowering of Schiller Unit 5. PSNH Generation  
15 maintains a diversified fuel portfolio including gas, oil and coal-fired units as well  
16 as hydro and renewable biomass with a total generation capacity of approximately  
17 1150 MW.

18 **Q. What is the purpose of your testimony in this proceeding?**

19 A. The purpose of my testimony is to provide information on all outages that took  
20 place at PSNH's fossil-fired, hydroelectric and biomass units and at NextEra  
21 Energy Resources, LLC's (formerly FPL Energy) Wyman Station, Unit No. 4 in  
22 which PSNH is a minority owner. This information will be for the period January  
23 1, 2011 through December 31, 2011. I shall also provide information on unit  
24 equivalent availability achieved by PSNH's steam generating units, consistent with  
25 reporting provided in previous years. Unit availability including planned outages  
26 will be calculated consistent with past submittals, as well as similar calculations,  
27 without the influence of planned outages.

1 **II. Generating Unit Operation**

2 **Q. Please provide an overview of the performance of PSNH's generating units in**  
3 **2011.**

4 A. PSNH's generating units produced 3,000,948 megawatt-hours (MWH). The  
5 fleet's availability during the 30 highest-priced days when customers' exposure to  
6 high market prices was the greatest was 95.6%.

7 Merrimack Station Unit 2 demonstrated a winter claimed capacity of 343.025 MW  
8 with its recently installed, more efficient HP/IP turbine. Merrimack Station's  
9 Units 1 and 2 each completed scheduled outages to perform not only routine  
10 maintenance, but also complete the tie-in of the newly constructed wet flue gas  
11 desulfurization system (FGD), commonly referred to as the scrubber. These  
12 outages were completed ahead of schedule and under budget. With the successful  
13 planned outages and few forced outages during 2011, Unit 1 and Unit 2's annual  
14 availability factors were 79.4% and 84.5%, respectively. In support of the fall  
15 scrubber tie-in outages, the Clean Air Project was completed successfully. The  
16 project was completed ahead of schedule and under budget. The scrubber was  
17 declared in-service on September 28 and continues to operate and perform well.  
18 Merrimack Station's Unit 1 and Unit 2 each operate with two ESP's, an SCR and a  
19 wet FGD to significantly reduce flue gas emissions.

20 At Schiller Station, December 1, 2011 marked the fifth anniversary of the Northern  
21 Wood Power at its Unit 5. Unit 5 produced 298,105 MWH in 2011 and has  
22 generated over 1,500,000 MWH during its 5 years of operation. Northern Wood  
23 Power completed a run of 113 consecutive days, the second longest run in its  
24 history. In addition, during the 178 days following its scheduled overhaul, the Unit  
25 sustained an availability of 99.7% for that period. In total, Schiller Station  
26 generated 526,996 MWH.

1 In 2011, PSNH's hydroelectric facilities generated 365,071 MWH. The 9 hydro  
2 facilities which are comprised of 20 units operated successfully and produced 8%  
3 more generation than last year.

4 Newington Station continued to burn a significant amount of natural gas, almost  
5 70%, in 2011. The unit utilized its fuel diversity, blending oil and natural gas to  
6 support the system and maximize its value to customers. Newington completed  
7 the year with a 93.6% equivalent availability.

8 PSNH Generation continued to focus on safe, compliant, reliable, and cost-  
9 effective operations and management of the generating fleet to provide benefit to  
10 customers. Similar to 2010, these efforts resulted in the generating stations'  
11 aggregate equivalent availability of 83.4% in 2011.

12 **Q. Please provide a summary of why PSNH's generating units have continued to**  
13 **operate well, with high reliability and high availability.**

14 A. PSNH Generation focuses on four key items important to long-term operational  
15 success: the day-in and day-out operation and maintenance of the units; the  
16 corrective and preventative maintenance conducted during forced outages; pre-  
17 planning and execution of scheduled and planned maintenance outages; and the  
18 use of a long-term maintenance outage and capital expenditure planning process.  
19 The long-term maintenance plans prioritize reliable plant operations and are  
20 founded on equipment history, on-going condition assessment and industry  
21 experience. The generating stations maintain a long-standing preventative  
22 maintenance program which allows for proactive management of plant equipment  
23 problems to best execute quality maintenance and the operations of the units.

24 PSNH Generation relies on an experienced management team and a skilled work  
25 force utilizing sound practices derived from experience within our facilities, as  
26 well as working with suppliers, contractors, experts and other generating plant  
27 peers in the industry. PSNH Generation's budget requests continue to emphasize a

1 proper balance between spending what is necessary in the most critical areas, while  
2 being sensitive to the overall cost of production to our customers taking Energy  
3 Service, both long term and short term. PSNH Generation works hard to  
4 determine how maintenance projects can be most effectively executed and how  
5 capital investments can be best applied to achieve a high level of plant  
6 performance. PSNH Generation also continues to integrate, into the above  
7 management focus, consideration of recommendations by the Commission's  
8 consultants.

9 **III. Unit Outages and Availabilities**

10 **Q. Please provide a list of all unplanned outages that took place during the**  
11 **period January 1, 2011 through December 31, 2011 for PSNH's fossil, hydro**  
12 **and biomass units and for NextEra's Wyman Station Unit No. 4.**

13 A. Attachment WHS-1 lists these outages. This listing is similar to the information  
14 submitted in the past, as a reporting requirement for the fossil hydro "outage  
15 information" resulting from discussion with the Staff in Docket No. DR 91-011.

16 **Q. Is there any additional reporting with respect to outages?**

17 A. Yes. PSNH provides outage reports for all unscheduled outages in excess of two  
18 days at either Newington Station or at the two units at Merrimack Station, and in  
19 excess of four days at the three units at Schiller Station and at Wyman Unit 4.  
20 These Outage Reports are included as Attachment WHS-2.

1 **Q. Please provide a chronological listing of the unplanned outages for which**  
2 **Outage Reports are provided in the testimony.**

3 A. The table below provides the chronological listing along with the start and end  
4 dates and times, the duration and the cause of the unplanned outages.

<u>Report No.</u>		<u>Outage Start</u>		<u>Outage End</u>		<u>Duration</u>	<u>Reason</u>
		<u>Date</u>	<u>Time</u>	<u>Date</u>	<u>Time</u>	<u>Days</u>	
OR-1	MK1	1/4	1655	1/7	1255	2.8	Furnace Wall Tube Leak
OR-2	MK2	1/25	1353	1/29	1209	3.9	Front Wall Tube Leak
OR-3	MK2	3/5	0737	3/7	2342	2.7	2A Condensate Pump
OR-4	MK2	5/13	1913	5/16	0055	2.2	Turbine Drain Leak
OR-5	NT	9/21	0700	9/23	1200	2.2	Planned Preventative Maintenance
OR-6	SR5	11/12	2108	11/19	1000	6.5	Plugged Cyclones
OR-7	MK2	12/7	0335	12/12	1610	5.5	Flue Gas Recirculating Fans

5 **Q. Please provide a brief summary of each of the Outage Reports discussed**  
6 **above.**

7 A. A summary of the Outage Reports follows:

8 2011-OR-01

9 This Merrimack Unit 1 outage was 2.8 days long and began on January 4. The unit  
10 was removed from service due to excessive water usage. The boiler inspection  
11 revealed leaks in the lower furnace on the south firebox wall in tubes 5 and 6. Due  
12 to the location of the leaks, staging was constructed on both the inside and the  
13 outside of the boiler to make the repairs. After the staging was erected outside the

1 firebox, removal of lagging, insulation, casing and refractory was completed. The  
2 tubes leaks were repaired with pad welding. After the weld repairs were  
3 performed, a successful pressure check and black light procedure were completed.  
4 While the repairs were being performed, an air heater wash was completed. An  
5 inspection of the circumferential and radial seals was performed and determined  
6 that no seal replacements were needed. Critical path was the water wall repair  
7 with additional jobs from the outage backlog also completed.

8 2011-OR-02

9 Merrimack Unit 2 was taken off line on January 25 for 3.9 days due to a tube leak  
10 in the front wall of the gas recirculating duct. Two tubes failed at the floor level  
11 which also caused damage to the floor of the gas recirculation duct, as well as the  
12 refractory and metal expansion joint. A tube leak was also located in “F” cyclone.  
13 The tubes were repaired with pad welding and a pressure check was performed.  
14 During the pressure check, two additional tube leaks were discovered. One leak  
15 was in the encased area of the windbox which cut a hole through the casing  
16 making it evident to the inspection team. The encased area was cut open and four  
17 barrel tubes were repaired with pad welding restoring the original wall thickness.  
18 The second leak was on a cracked weld of a furnace supply tube. The insulation,  
19 lagging and metal frame were removed to access the leak. Once all the tube leaks  
20 were repaired, a final waterside pressure test was performed and no other tube  
21 leaks were found. Critical path was the boiler tube repairs with additional jobs  
22 from the outage backlog also completed.

23 2011-OR-03

24 This Merrimack Unit 2 outage began on March 5 and was 2.7 days long. The  
25 outage was due to the failure of the 2A condensate pump. The upper guide  
26 bushing was found to have worn resulting in the failure of the pump. A spare  
27 pump and motor from inventory were installed. The failed pump and motor were  
28 removed and sent out to be rebuilt and returned to inventory. Critical path was the

1 installation of the spare condensate pump and motor with additional jobs from the  
2 outage backlog also completed.

3 2011-OR-04

4 Merrimack Unit 2 was removed from service on May 13 due to a turbine drain  
5 steam leak. This outage was 2.2 days long. The unit developed a steam leak under  
6 the HP/IP turbine on a governor valve drain-line. The entire drain line was  
7 replaced. The new welds were stress relieved and non-destructively examined.  
8 Critical path was the weld repair of the drain steam leak with additional jobs from  
9 the outage backlog also completed.

10 2011-OR-05

11 This Newington outage was 2.2 days long and began on September 21 to complete  
12 planned maintenance. The outage was scheduled to allow for a number of projects  
13 to be completed prior to the beginning of the 2011-2012 winter season. The  
14 critical path job of the outage was the replacement of the rebuilt main boiler feed  
15 pump/turbine 1B lube oil pump. The pump had been inspected in March 2011  
16 during the scheduled Annual Overhaul. A crack in the pump's outlet flange was  
17 discovered. As the original equipment manufacturer, KSB Pump, no longer  
18 manufactured or supported the pump, a new pump casing was fabricated by  
19 PSNH's Generation Maintenance. Prior to this planned outage, Generation  
20 Maintenance also reverse engineered the housing and installed the original rotating  
21 assembly in the new casing. A technical representative from KSB performed a full  
22 inspection of the original pump prior to the new casing being fabricated and found  
23 that despite the age of the pump, the internals were all within the original  
24 specifications and concluded that they were suitable for continued operation. The  
25 unit consisting of the new casing, the new housing, and the original rotating  
26 assembly was installed during this outage.



1           2011-OR-06

2           This Schiller Unit 5 outage began on November 12 and was 6.5 days long. The  
3           unit was taken offline to clean cyclone and dip leg pluggage.

4           A boiler inspection was conducted, as well as an inspection of the ash system. A  
5           bag house inspection was conducted and the perforated plate sections in the eight  
6           modules were repaired or replaced as necessary. Condenser water-boxes were  
7           opened and cleaned. Moly-guard coolers were also opened and cleaned. A  
8           number of outage backlog jobs were also completed. Drum level controls were  
9           adjusted to address start-up problems that tripped the boiler. With additional  
10          adjustments, the unit was stabilized and remained on-line.

11          2011- OR-07

12          Merrimack Station Unit 2 was taken off line on December 7 for a 5.5 day outage  
13          due to problems with the gas recirculation fans. The 2A fan was experiencing high  
14          vibration and the 2B fan outboard fan bearing temperature was running high. A  
15          contractor was utilized to turn down and hone the 2B rotors on both ends of the  
16          fan. The bearings were sent out, re-babbitted and bored to the new dimensions.  
17          The drive couplings were replaced, motors were cleaned, seals and internals were  
18          inspected, and balancing/alignments were performed on each fan. When the gas  
19          recirculation fan work was complete, the unit was made available for dispatch.

20   **Q.    Were scheduled outages performed at any of PSNH's fossil and hydro units**  
21   **during the period January 1, 2011 through December 31, 2011?**

22    A.    Yes. Attachment WHS-1 contains a list of outages including scheduled  
23          maintenance outages for each of PSNH's fossil, biomass, hydro, and combustion  
24          turbine units, as well as the Wyman 4 unit and the Clean Air Project tie-in outages.  
25          WHS-3 also summarizes the planned maintenance periods for the fossil units.

26

1 **Q. Please provide a list of scheduled outages at PSNH's fossil units during**  
2 **January 1, 2011 through December 31, 2011.**

3 A. The scheduled maintenance outages are listed below.

<b>Unit</b>	<b>Scheduled Outages</b>
Schiller Unit 6	3/4 – 3/25
Newington Unit 1	3/26 – 4/10
Schiller Unit 5	4/1 – 5/18
Merrimack Unit 1	4/12 – 5/15
Merrimack Unit 2	4/21 – 4/29
Merrimack Unit 1	9/6 – 9/25
Schiller Unit 4	10/1 – 11/5
Merrimack Unit 2	10/12 – 11/14
Merrimack Unit 1	10/31 – 11/13

4 The outages listed in the table above were scheduled to complete routine  
5 maintenance and to coordinate with the Merrimack Station scrubber installation.  
6 Routine maintenance was conducted at Schiller Unit 6, Newington Unit 1, Schiller  
7 Unit 5, Merrimack Unit 1, Schiller Unit 4 and Merrimack Unit 2.

8 With low-priced energy available in the wholesale market, Merrimack Unit 1's  
9 scheduled maintenance work was moved to the spring. This allowed the  
10 Merrimack 1 fall tie-in outage to be shortened by 2.5 weeks and provide almost 3  
11 weeks between the end of the Merrimack 1 tie-in outage and the beginning of the  
12 Merrimack 2 fall outage to operate the newly installed scrubber equipment with  
13 only Merrimack 1. Merrimack 2 was also brought off line in the spring during the  
14 Merrimack 1 maintenance outage to perform transmission work that required both  
15 units to be off.

16 The Merrimack 1 fall tie-in outage was 2.5 weeks shorter due to the work  
17 completed in the spring. More importantly, Merrimack 1 returned to service on

1 September 23, rather than the originally planned October 10, and this allowed a  
2 longer operational period for the scrubber with Merrimack 1 only. With the  
3 scrubber operating well, Merrimack 2 was taken off line for its tie-in outage. The  
4 period of scrubber operation with Merrimack 1 was very successful, which  
5 confirmed that proceeding with the Merrimack 2 tie-in outage provided no  
6 foreseeable operational risks. Merrimack Unit 2 began its maintenance and tie-in  
7 outage on October 12 to complete a scheduled 6 week outage. It returned to  
8 service on November 14. During this outage Merrimack 1 was removed from  
9 service to complete duct work, and the bypass duct which required both units to be  
10 offline.

11 **Q. Are these scheduled outages usually reviewed as part of the Reconciliation of**  
12 **Energy Service and Stranded Costs docket?**

13 A. Yes. A review of the scheduled outages is completed by the Commission's Staff  
14 utilizing an outside consultant. The outside consultant completes on-site  
15 interviews and a review process of the planned outages.

16 **Q. Are there any other reporting requirements associated with this filing?**

17 A. Yes, PSNH is providing updates to new and ongoing recommendations by Accion,  
18 consistent with the requirements of Commission Order 25,321. Those updates are  
19 contained in Appendix A which contains all of the recommendations that were  
20 included in the settlement agreement. Also included is a description of the actions  
21 PSNH has taken to address each recommendation.

22 **Q. Does this conclude your testimony?**

23 A. Yes, it does.