

**STATE OF NEW HAMPSHIRE
BEFORE THE PUBLIC UTILITIES COMMISSION**

**Public Service Company of New Hampshire
Reconciliation of Energy Service and Stranded Costs for
Calendar Year 2017**

**DIRECT TESTIMONY OF
WILLIAM H. SMAGULA**

1 **I. Introduction**

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

3 A. My name is William H. Smagula. I am the Vice President of Generation for Public
4 Service Company of New Hampshire, d/b/a Eversource Energy (“Eversource”). My
5 business address is 780 North Commercial Street, P.O. Box 330, Manchester, New
6 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 Masters of Science in Mechanical Engineering from
10 Northeastern University. I began working for Public Service Company of New
11 Hampshire in 1978. My duties have included craft skills training, engineering
12 projects, station management, director of fossil and hydro fleet management (in NH
13 and CT/MA). I moved into my current position in 2012.

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

15 A. Yes. I have provided testimony in previous Commission proceedings including
16 energy service and reconciliation dockets. I also testified before the Commission

1 during the Schiller Biomass Conversion proceeding and the Merrimack Scrubber
2 docket.

3 **Q. Please describe your responsibilities as Vice President- NH Generation.**

4 A. In my present position, I am responsible for the support of safe and reliable
5 operations and environmental and regulatory compliance, for Eversource's
6 generating stations in 2017. Eversource maintained a diversified fuel portfolio
7 including gas, oil and coal-fired units as well as hydro and renewable biomass with
8 a total generation capacity of approximately 1150 MW.

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

10 A. The purpose of my testimony is to provide information on all outages that took
11 place at Eversource's fossil-fired, hydroelectric and biomass units and at NextEra
12 Energy Resources, LLC's (formerly FPL Energy) Wyman Station, Unit No. 4 in
13 which Eversource was a minority owner until November 1, 2017 when we sold our
14 share to NextEra. This information will be for the period January 1, 2017 through
15 December 31, 2017. I shall also provide information on unit equivalent availability
16 achieved by Eversource's steam generating units, consistent with reporting provided
17 in previous years. Unit availability including planned outages will be calculated
18 consistent with past submittals, as well as similar calculations, without the influence
19 of planned outages.

20 **II. Generating Unit Operation**

21 **Q. Please provide an overview of the performance of Eversource's generating
22 units in 2017.**

23 A. Eversource's generating units produced 982,454 megawatt-hours (MWH) during
24 2017. The fleet's availability during the 30 highest-priced days when customers'
25 exposure to high market prices was the greatest was 91.39%. Eversource focused
26 on safe, compliant, reliable, and cost-effective operations and management of the
27 generating fleet to provide benefit to customers, as well as the successful
28 management of planned outages and forced outages during 2017. These efforts

1 resulted in the generating stations achieving an aggregate equivalent availability of
2 92.2% in 2017.

3 Merrimack Unit 1 and Unit 2 provided high availability in the winter months of
4 January, February and March with equivalent availability factors of 91.90% on Unit
5 1 and 92.88% of Unit 2. The annual equivalent availability factors (“EAF”) were
6 85.0% and 90.6%, respectively. These availabilities are reduced due to outage
7 planning which considers overtime costs and replacement power costs, often
8 resulting in a longer outage window (lower EAF), but lower overall costs to
9 customers. The Flue Gas Desulfurization system (“scrubber”) completed its sixth
10 full calendar year of successful operation with overall good performance.
11 Merrimack Station also operates four electrostatic precipitators and two selective
12 catalytic reduction systems to significantly reduce flue gas emissions.

13 At Schiller Station, December 1, 2017 marked the eleventh anniversary of the
14 Northern Wood Power biomass unit (Unit 5). In 2017, Unit 5 produced 287,726
15 MWH, an 76.0% capacity factor. During the year Unit 5 burned about 415,656 tons
16 of wood. Units 4 and 6 generated 63,372 MWH with equivalent availability factors
17 of 99.3% and 91.3%, respectively.

18 In 2017, Newington Station continued to use both natural gas and #6 fuel oil to
19 support the system grid and maximize its value to customers. Natural gas
20 accounted for 71.29% of total station generation and #6 oil accounted for 28.71% of
21 the total station generation. Newington Station participated in the ISO-NE Winter
22 Reliability Programs for the 2015/2016, the 2016/2017 and the 2017/2018 periods
23 through the ability of having dual fuel burning capability of gas and oil and having
24 an appropriate oil inventory. This resulted in a benefit to customers of
25 approximately \$2 million in the 15/16 program period, about \$1.7 million in the
26 16/17 program period and \$1.7 million in the 2017/2018 period. Eversource
27 managed this program to maximize customer benefit while maintaining unit
28 availability and reliability. Newington Station completed the year with a 95.7%
29 equivalent availability.

1 Eversource's hydroelectric facilities consist of 9 hydro facilities with a total of 20
2 units. These units have a total installed capacity of 70.6 MW and successfully
3 produced 347,513 MWH in 2017. The hydro fleet produces the company's lowest
4 cost power while using a renewable, reusable, emission-free energy source.

5 **Q. Please provide an overview of the safety and environmental performance of**
6 **Eversource's generation employees in 2017.**

7 A. There were no safety incidents in 2017 in which Generation employees lost
8 workdays or had any restricted ability to perform their full duties. Eversource's
9 generation employees maintain a high focus on individual ownership of safety.
10 Safety efforts are recognized by management; and employees have the ability to
11 stop and/or modify jobs as necessary to maintain a safe environment. Hazard
12 analyses are completed before each job; and job hazard analyses are developed for
13 more complex tasks.

14 Environmental compliance receives a similar high priority focus. There is well
15 trained staff at each facility to maintain compliance and recognize potential
16 environmental issues. Local environmental staff is supported by highly qualified
17 subject matter experts. Key permits and approvals are in place to operate the
18 facilities; and regulatory requirements and deadlines have been appropriately
19 satisfied. Importantly, in 2017, the facilities continued their record of no Notices of
20 Violation.

21 **Q. Please provide a summary of how Eversource's generating units continue to**
22 **operate well, with high reliability and high availability, recognizing the**
23 **changing market conditions, the capacity demands and the on-going discussion**
24 **of divestiture.**

25 A. Quality operations and maintenance ensures the generating equipment is prepared to
26 provide high reliability in an efficient and timely fashion to provide value to
27 customers and benefit to the ISO-NE grid.

1 Eversource's Generation team continues to focus on key items important to long-
2 term operational success: the day-in and day-out operation and maintenance of the
3 units; the corrective and preventative maintenance conducted during forced outages;
4 pre-planning and execution of scheduled and planned maintenance outages; and the
5 use of a long-term maintenance outage and capital expenditure planning process.
6 While plans to accomplish these goals have been revised to accommodate the
7 changing market and unit operations, the goals still remain safety and high
8 reliability at the lowest possible cost.

9 While the goal of the preventive and predictive maintenance program, maintaining
10 safety and high reliability at the lowest cost, has not changed, assessment methods
11 for equipment and system conditions have changed as capacity factors have
12 decreased. More information and accurate information allows targeted expenditure
13 of funds and only when needed.

14 With less wear and tear on equipment due to reduced operating hours, major
15 overhaul work and preventive and predictive maintenance work has been assessed
16 utilizing new and expanded techniques which allow maintenance and operations
17 professionals to make better informed decisions. These expanded efforts to assess
18 preventative maintenance has generally resulted in reduced maintenance needs and
19 lengthened overhaul and repair cycles, as appropriate. Condition-based
20 maintenance is used to more cost effectively determine routine work, as well as
21 outage scopes and budgets.

22 Long-term maintenance plans prioritize reliable plant operations and are founded on
23 operations, equipment history, on-going condition assessment, and industry
24 experience. The generating stations maintain a long-standing preventative
25 maintenance program to best execute quality maintenance and the operation of the
26 units. With fluctuations in market conditions due to economic changes, as well as
27 the continuing evolution of gas markets, Generation has made changes to the
28 management of its fleet with adjustments to expenses and staffing consistent with
29 reduced capacity factor operations. Generation continues to rely on an experienced
30 management team and a well-trained, skilled work force utilizing sound practices

1 derived from experience within our facilities, as well as working with suppliers,
2 contractors, experts, and other generating plant peers in the industry.

3 To summarize, Generation management continues to perform thorough reviews of
4 the preventative maintenance programs at all fossil steam units. The key goals in
5 making changes are to avoid any risks of reduced reliability while reducing
6 customer costs. Also, in addition to modified work practices, efforts have focused
7 on appropriately reducing inventory levels to be in line with reduced usage of parts
8 and materials. In addition, selected reduction of staff via attrition had been an
9 ongoing effort during 2017 to improve retention opportunities of remaining
10 employees, reduce costs and make the assets more attractive to bidders.

11 The 2017 capital and O&M expenses reflected a number of planned major
12 maintenance activities. A boiler overhaul on Merrimack Unit 1 included
13 replacement of the fan coil and blow down tank. Schiller Station completed
14 overhauls on Unit 5, 6 and its combustion turbine (CT). And finally, license
15 renewal associated with the Eastman Falls Hydro was completed with the license
16 issued on April 20, 2017. No issues have been raised by the agencies and the new
17 license became effective on January 1, 2018.

18 Operating budgets continued to emphasize a proper balance between spending what
19 is necessary in the most critical areas, while being sensitive to the overall cost of
20 production. Generation reviews maintenance projects to determine how they can be
21 most effectively executed and how capital investments can be best applied to
22 achieve a high level of plant performance.

23 Regarding Divestiture activities, a large effort was made to support the development
24 of an electronic data room, respond to thousands of written questions from multiple
25 bidders, provide lengthy presentations to each bidder and manage tours of all
26 facilities of interest to each bidder. Follow-up questions and numerous conference
27 calls were subsequently held. Large efforts also were made to provide detailed
28 Environmental Site Assessments, ALTA site maps, subdivision and easement

1 definitions, inventory reviews, operations and maintenance reviews, budget reviews,
2 etc. We believe the quality visual and operational condition of all our facilities
3 along with the demonstration of having a prepared and qualified professional and
4 craft workforce greatly enhanced bidders' interests and ultimately improved final
5 purchase pricing significantly.

6 **III. Unit Outages and Availabilities**

7 **Q. Please provide a list of all unplanned outages that took place during the period**
8 **January 1, 2017 through December 31, 2017 for Eversource's fossil, hydro,**
9 **and biomass units and for NextEra's Wyman Station Unit No. 4.**

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

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

14 A. Yes. Eversource provides outage reports for all forced and maintenance outages in
15 excess of two days at either Newington Station or at the two units at Merrimack
16 Station, and in excess of four days at the three units at Schiller Station or at Wyman
17 Unit 4. These Outage Reports are included as Attachment WHS-2.

18 **Q. Please provide a chronological listing of the forced and maintenance outages**
19 **for which Outage Reports are provided in the testimony.**

20 A. The following table provides the chronological listing along with the start and end
21 dates and times, the duration, and the causes of these forced and maintenance
22 outages. The outages listed do include short term maintenance outages coordinated
23 with wholesale marketing and scheduled with ISO-NE.

1 FORCED & MAINTENANCE OUTAGE LIST

NH Generation Steam Units Forced & Maintenance Outage List							
Report No.		Outage Start Date Time		Outage End Date Time		Duration Days	Reason
OR-1	MK1	02/09	2026	02/16	1503	6.8	Furnace Floor Slag Tap Pluggage
OR-2	MK2	02/27	0709	03/03	1820	4.5	Forced Draft Fan Repair
OR-3	SR5	04/27	1515	05/04	1845	7.1	Boiler Tube Leaks
OR-4	MK2	05/15	0700	05/25	1540	10.4	Furnace Waterwall Tube Leaks
OR-5	SR5	09/03	0047	09/13	2243	11.0	Boiler Reliability Outage
OR-6	SR5	09/16	0910	09/23	2356	7.6	In-Bed Tube Leak
OR-7	MK1	10/17	0700	10/23	0700	6.0	Early Start to Planned Outage
OR-8	MK2	10/20	0700	10/23	0700	3.0	Early Start to Planned Outage
OR-9	MK2	11/13	1035	11/21	1538	8.2	Main Boiler Feed Pump Valve
OR-10	SR5	12/09	0020	12/15	2003	6.8	Boiler Reliability Outage
OR-11	MK2	12/28	0100	12/31	0117	3.0	Condenser Tube Leaks

2

3 **Q. Please discuss the longer outage durations provided in the table.**

4 A. Eversource monitors customer load and the energy market and seeks to provide low
 5 cost energy to Eversource’s customers. With that, during periods of low electrical
 6 demand and low power market prices, the outage duration is adjusted to use less
 7 overtime. While this practice may extend the duration of the outage, the total
 8 outage expense is minimized, by avoiding the associated overtime costs.

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

2 A. A summary of the Outage Reports follows:

3 2017-OR-01

4 This Merrimack Unit 1 outage was 6.8 days long and began on February 9. The
5 unit was removed from service to repair the furnace floor slag tap pluggage.

6 The 1B Forced Draft Fan Motor Inboard Bearing temperature increased to 185
7 degrees Fahrenheit contributing to the cause of the outage. The unit load was
8 reduced to 60 MW in order to troubleshoot and unload the fan bearing. The furnace
9 floor slag tap became plugged and the Unit load was subsequently brought back up
10 to full load in order to attempt to clear the tap. The slag tap rodder failed, requiring
11 a new hammer assembly, and making the rodder unavailable. Limestone was added
12 to the cyclones in an attempt to soften the slag. Limestone injection was not
13 sufficient to cause the slag to flow. The slag was removed and the slag rodder was
14 repaired. The decision was made to take the Unit off line due to risk of overloading
15 the furnace floor with slag.

16 2017-OR-02

17 This Merrimack Unit 2 outage was 4.5 days long and began on February 27.

18 Unit 2 was removed from service due to several cracks in the housing of the 2A
19 forced Draft fan which caused excessive vibration. Upon inspection of the cone, it
20 was determined that it needed to be replaced with a spare cone that was in
21 inventory. In order to replace the cone, the fan bearings had to be removed, the
22 motor had to be uncoupled from the fan and the inlet vanes had to be removed.

23 During the outage, the soot blowing drain line isolation drain valve was replaced
24 and a 20-foot section of soot blowing drain line was replaced.

25 In addition, a complete boiler inspection was performed, cyclones were inspected,
26 and a cyclone tube leak and boiler tube leak were repaired.

1 2017-OR-03

2 This Schiller Unit 5 outage began on April 27 and lasted through May 4. Unit 5
3 was online when a tube leak occurred. The inspection revealed an in-bed tube that
4 failed which damaged three adjacent tubes. Damaged portions were replaced.
5 Upon completion of repairs a successful hydro was completed.

6 2017-OR-04

7 This Merrimack Unit 2 outage was 10.4 days long and began on May 15. It was
8 removed from service due to tube leaks on 2G-cyclone re-entry throat tubes 15R &
9 16R. Replacement of these tubes was required, however, due to the extremely
10 difficult location, the work required installing staging in the boiler and wind box to
11 the top of the re-entry throat, removal of refractory with high pressure water
12 blasting, removal of pin studs that hold the refractory in place, removal of round bar
13 that seals the tubes, installing rigging to support re-entry throat panel, bend tubes
14 15R & 16R to specification, and cutting out the slag tap tubes. Once the tubes 15R
15 & 16 were replaced, a hydro was completed. All other boiler elements were then
16 reinstalled.

17 2017-OR-05

18 This Schiller Unit 5 outage was 11 days long and began on September 3. The unit
19 was removed from service for its planned maintenance outage. Retubing of half of
20 the air heater was completed and cyclone cleaning and boiler inspections were
21 performed.

22 2017-OR-06

23 This Schiller Unit 5 outage was 7.6 days long and began on September 16. The unit
24 was removed from service to repair tube leaks in the furnace in-bed section. An
25 inspection revealed a tube that failed and had damaged additional tubes. Damaged
26 portions were removed and dutchman installed and pad welding was performed to
27 complete repairs.

28 Cyclone 1 was plugged. Cyclone cleaning and inspections were performed on all
29 others.

1 2017-OR-07

2 This Merrimack Unit 1 outage was 6.0 days long and began on October 17. There
3 were 2 main projects that needed to be completed that required both Unit 1 and Unit
4 2 to be unavailable prior to the start of the Unit 1 Overhaul on October 23.

5 The blow down tank needed to be replaced which has several drain lines from both
6 units connected to it. This required several drain lines to be prepped for cutting
7 prior to removing the old tank. Once the preparation of the pipes was completed
8 and the rigging in place to support all the piping when it was cut, the Unit was taken
9 out of service to cut all drain lines and remove the old tank. Once the tank was
10 removed, the old base was removed and a new base was installed prior to setting the
11 new blow down tank in place. Several of the old valves were replaced and the drain
12 lines were rewelded in place prior to black light testing of the new welds which all
13 passed inspection.

14 2017-OR-8

15 This Merrimack Unit 2 outage began on October 20 to perform planned
16 maintenance. There were two main projects that needed to be completed that
17 required both Unit 1 and Unit 2 to be unavailable prior to the start of the Unit 1
18 Overhaul.

19 The blow down tank needed to be replaced which has several drain lines from both
20 units connected to it.

21 The other job which required Unit 1 & Unit 2 to be off line was the Scrubber
22 Inspection and repairs. Prior to entering the Scrubber vessel, the inlet duct had to be
23 cleared of debris. Once that was complete, the FGD vessel was drained and the
24 bottom debris removed, thorough inspections were performed. Additional work
25 was also performed during this outage.

26 2017-OR-9

27 On November 13, during a Unit 2 shutdown the main boiler feed pump discharge
28 valve was seized in the open position and unable to operate. This valve being stuck

1 in the position prevented Unit 2 from starting. Upon inspection it was noted that
2 the actuator was electrically operating however the drive nut that physically turns
3 and drives the valve stem open and closed was stripped. At that point the actuator
4 was removed and sent to Millennium Power's shop for repair. The valve itself was
5 then inspected and the stem and plug were found to be damaged, which caused the
6 actuator to fail. The valve was rebuilt and actuator reinstalled and returned to
7 service on 11/21/17.

8 2017-OR-10

9 This Schiller Unit 5 outage began on December 9 and lasted through December 15.
10 Cyclones 1 & 4 were found to be plugged. The boiler was staged for contractor
11 work and the pluggage was removed. During this outage, additional work was
12 performed.

13 2017-OR-11

14 Newington Station began a 3-day outage on December 28. The unit was preparing
15 to phase on line for a scheduled phase from cold start conditions. Water chemistry
16 indicated an incipient condenser tube leak. Circulating water was secured to the
17 south side of the condenser and the condensate in this side was used to fill the north
18 side in efforts to identify the leak source. Since chloride levels continued to climb
19 (indications of a condenser tube leak), the north side circulating water was placed
20 back in service and the south side was secured and drained. It was determined the
21 condenser tube leak in the south side was significant and the cause of this major
22 leak. The startup was ended and the unit declared unavailable. The condenser tube
23 leak was identified, plugged and operations began restoring water chemistry.

24 **Q. Were scheduled Planned Outages performed at any of Eversource's fossil and**
25 **hydro units during the period January 1, 2017 through December 31, 2017?**

26 A. Yes. Attachment WHS-1 contains a list of unit outages including planned
27 maintenance outages for each of Eversource's fossil, biomass, hydro, and
28 combustion turbine units, as well as the Wyman 4 unit. WHS-3 also summarizes
29 the planned maintenance periods for the fossil units.

1 **Q. Please provide a list of scheduled Planned Outages at Eversource’s fossil units**
2 **during January 1, 2017 through December 31, 2017.**

3 A. The planned maintenance outages & their durations were:

Unit	Planned Outages
Schiller Unit CT	3/27 – 8/30
Schiller Unit 5	4/1 – 4/23
Schiller Unit 6	9/18 – 10/13
Merrimack Unit 2	10/23 – 10/29
Merrimack Unit 1	10/23 – 11/20
Merrimack Unit CT1	11/6 – 11/8
Merrimack Unit CT2	11/8 – 11/10
Newington	11/14– 11/23

4

5 The outages listed in the table above were scheduled to complete routine
6 maintenance to support improved reliability during subsequent higher priced
7 operating periods.

8 **Q. Are these scheduled outages usually included as part of the Reconciliation of**
9 **Energy Service and Stranded Costs docket review?**

10 A. Yes. A review of the scheduled outages has traditionally been completed by the
11 Commission’s Staff utilizing an outside consultant. The outside consultant has
12 performed on-site interviews and a review process of the planned outages.

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

14 A. Yes, it does.