REVIEW OF COSTS

PSNH GENERATION

for the

New Hampshire Public Utilities Commission

SUPPLEMENTAL INFORMATION

September 2013

~~CONFIDENTIAL BUSINESS INFORMATION~~

Docket No. DE 12-292

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SECTION 1: INTRODUCTION

PSNH filed report REVIEW OF COSTS – PSNH GENERATION on December 12, 2012 in response to Order No. 25,380.

During the hearing on December 18, 2012, the Commission requested clarifications to the report and further analysis.

Additionally, Order 25,535 (June 27, 2013) required PSNH to:

> "Update its report regarding generation costs and submit it with its energy service rate filing in September 2013. In preparing the report, PSNH should take into account the recent developments at Independent System Operator-New England including but not limited to their participation in the Winter Reliability Program, an update on the market values of power from the Berlin Station, and operations of the plants due to increased migration."

In response to these requests, PSNH provides the following Supplemental Information.

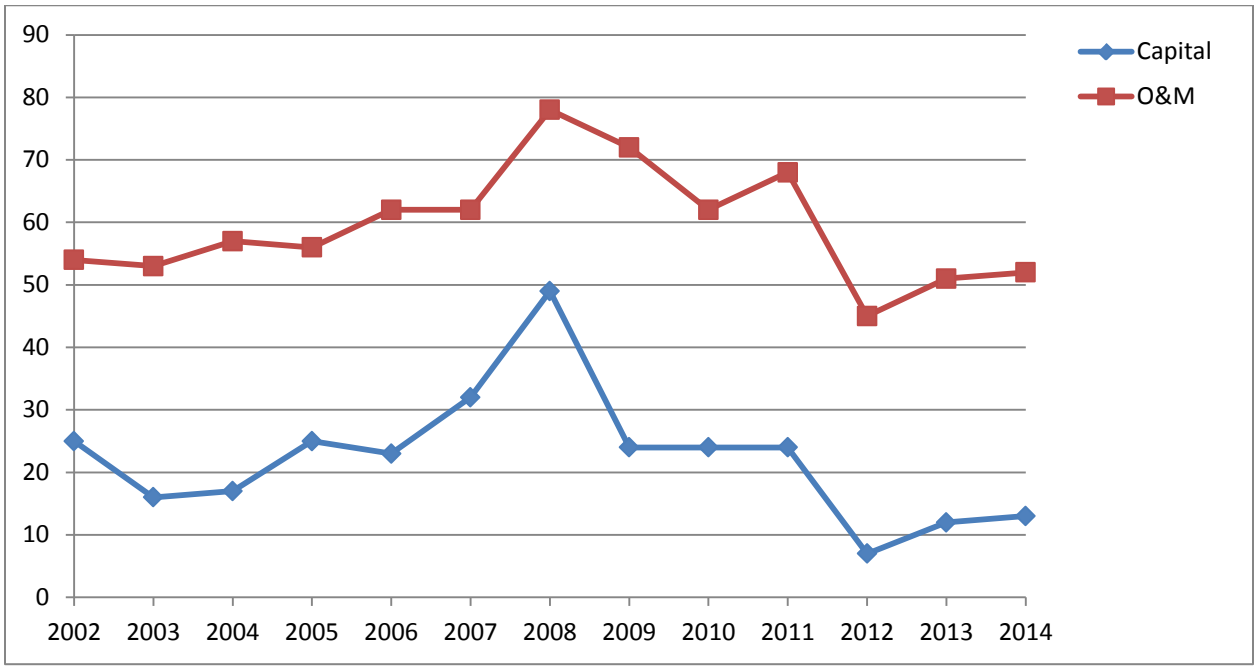
SECTION 2: SUPPLEMENTAL RESPONSE to - "REVIEW OF COSTS - PSNH GENERATION Dec 2012"

2.0 REVIEW OF COSTS

As discussed in the December 12, 2012 review, a summary of O&M and Capital costs for a historical period are provided to establish a context for reviewing the more recent annual costs. Data for the period from 2011-2014 are broken out for Merrimack, Schiller, and Newington Stations, PSNH's Hydro Stations (in total), and Staff, Generation Maintenance, etc. A review of the 2011-2014 costs by resource provides further details and trends while providing general explanations. The rigorous and detailed annual prudence reviews that have occurred in the last ten years looked at the maintenance and capital work performed and have evaluated whether there was appropriate management of the units to meet customers' needs. These annual reviews are available on file with the NHPUC to supplement this document. Consistent with the earlier report, this supplemental information takes a modified view of costs and is tailored to be responsive to these specific requests.

To assist in this review, Chart No. 1 graphs actual Capital Costs and Operations and Maintenance (O&M) costs over the past decade. Years 2002 through 2012 reflect year end actuals, and the amounts through 2014 are the latest budget forecast.

Chart No. 1 **CONFIDENTIAL**
Generation Spending Trend
(Non-Scrubber Direct Costs)



1. Does not include Northern Wood Power or Clean Air Projects
2. O&M budget excludes CAP (Scrubber) expenses

2.1 OPERATIONS AND MAINTENANCE BUDGET REVIEW

Costs reviewed herein for Operations and Maintenance (O&M) are direct costs without any Scrubber-related costs included.

Generation's O&M budget for 2012 was the Department's lowest in 10 years. The 2013 and 2014 budget forecasts, [**BEGIN CONFIDENTIAL** [redacted] **END CONFIDENTIAL**]

The following four tables provide a summary breakdown of Generation's O&M annual totals:

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Table No. 1
2011 O&M Actuals – Direct Costs
($000)

Location	NU Labor	Materials & Supplies	Outside Services	Contractor Labor(1)	Fees & Payments	Other	Total
Merrimack	[redacted]						
Schiller							
Newington							
Hydro							
Staff, GM & Wyman							
Totals							67,726

1. For steam units, peak resource employed during forced outages and planned outages including boilermakers, pipefitters, millwrights, etc. Also specialty contractors (e.g. flyash vacuum services) For hydro units, specialty contractors during planned inspections.
2. Excludes Scrubber costs

Table No. 2 (*updated*)
2012 O&M Actuals – Direct Costs
($000)

Location	NU Labor	Materials & Supplies	Outside Services	Contractor Labor (1)	Fees & Payments	Other	Total
Merrimack	[redacted]						
Schiller							
Newington							
Hydro							
Staff, GM & Wyman							
Totals							45,242

1. For steam units, peak resource employed during forced outages and planned outages including boilermakers, pipefitters, millwrights, etc. Also specialty contractors (e.g. flyash vacuum services) For hydro units, specialty contractors during planned inspections.
2. Excludes Scrubber costs

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Table No. 3
2013 O&M Budget Forecast – Direct Costs
($000)

Location	NU Labor	Materials & Supplies	Outside Services	Contractor Labor(1)	Fees & Payments	Other	Total
Merrimack	[redacted]						
Schiller							
Newington							
Hydro							
Staff, GM & Wyman							
Totals							50,833

1. For steam units, peak resource employed during forced outages and planned outages including boilermakers, pipefitters, millwrights, etc. Also specialty contractors (e.g. flyash vacuum services) For hydro units, specialty contractors during planned inspections.
2. Excludes Scrubber costs

Table No. 4 (*new*)
2014 O&M Budget Forecast – Direct Costs
($000)

Location	NU Labor	Materials & Supplies	Outside Services	Contractor Labor (1)	Fees & Payments	Other	Total
Merrimack	[redacted]						
Schiller							
Newington							
Hydro							
Staff, GM & Wyman							
Totals							52,055

1. For steam units, peak resource employed during forced outages and planned outages including boilermakers, pipefitters, millwrights, etc. Also specialty contractors (e.g. flyash vacuum services) For hydro units, specialty contractors during planned inspections.
2. Excludes Scrubber costs

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As can be seen from these data, there is a clear and significant reduction in O&M, and in particular in Contractor Labor, reflecting reduced operating hours. Recognizing year-to-date success controlling costs, PSNH anticipates 2013 costs to be between $1.5M and $2.5M below the original budget. The 2014 budget will continue to be reviewed and adjusted based on planning and operations.

2.1.1 NU Labor Discussion

PSNH's Generation previously had 301 employees with a fully staffed complement of 320. Generation has continued to reduce its staff which currently is at 283 employees with a number of positions unfilled. The Department's fully staffed complement is expected to return to 294 in 2014. Each facility and group remains staffed to meet the critical core or valley workload needed to properly support Generation on a daily basis. As stated earlier, with lesser operational demands, staffing has been reduced via attrition; and in an effort to reduce budgets and therefore overall cost, PSNH is reducing the use of contractors and employing every opportunity possible to use only PSNH's employees for various maintenance or capital tasks.

Work is performed over lengthened schedules with employees doing the work generally on straight time, resulting in little or no incremental cost. Use of employee resources from other locations/stations continues to be expanded, shifting workers to facilities where higher priority work is needed.

Management experience and the individual stations' designs determine the proper staffing complement with well trained and experienced personnel. We continue to challenge these historical staffing levels but we must manage the assets prudently with competent employees.

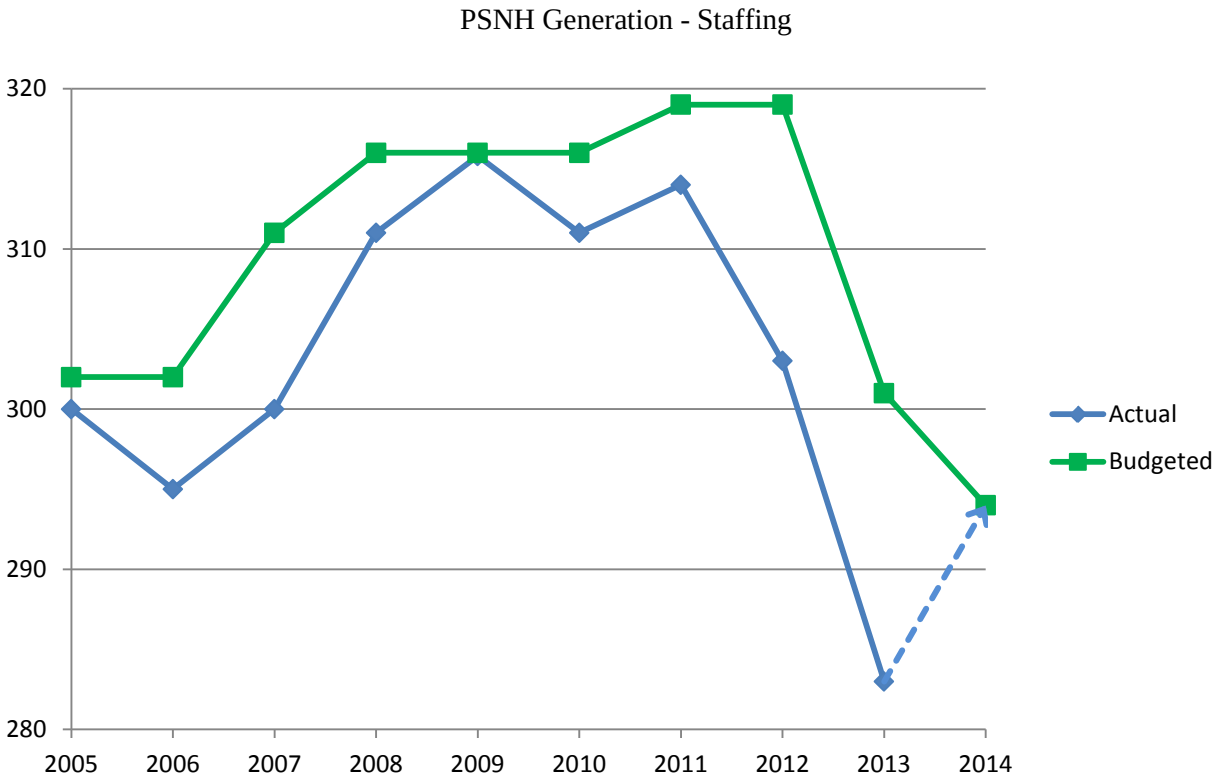
The prior report discussed that over the last few years with reduced capacity factors, operations personnel have adjusted and expanded their duties to align more with this new equipment duty. Similarly the facilities physical day workers (mechanics, electricians, instrumentation mechanics, chemists, stockmen, fuel handlers, etc.) have had significant changes in their day-to-day work.

As capacity factors have adjusted downward in recent times,

- Budgets have similarly been reduced to reflect less corrective maintenance due to less wear and tear on equipment;
- Preventative maintenance has been scaled back due to reduced operating hours;
- PSNH has greatly reduced the use of supplemental external buildings trade personnel (boiler makers, millwrights, electricians, etc.);
- Resources are shared even more between stations, generation maintenance, and central staff.

The historic philosophy of staffing for the minimum, sustainable workload and supplementing with temporarily hired contractors has proven to be a good strategy. Now with less corrective and preventative maintenance and lower capacity factors, the employees are able to complete this work without the assistance of outside labor.

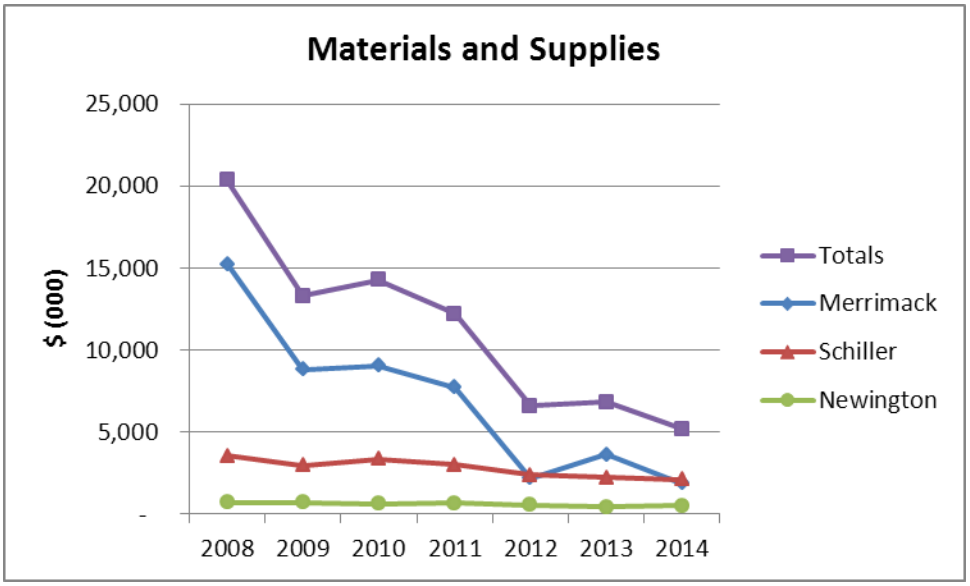
It is critical to remember that the skilled worked force at the facilities is a result of many years of training. As operating scenarios change, qualified people for these jobs are not easily found if the work force in these areas was allowed to drop significantly. Many station positions cannot be fulfilled by using contractors or by using newly hired personnel. PSNH management factors the required competency levels into its staffing decisions and actions.



(1) 5 employees added in 2007 in the wood yard for the Schiller 5 Northern Wood Power Project.
(2) 9 employees added in 2010 and 2011 for the Merrimack Scrubber Project.

As a reminder, it is important to understand that there is not necessarily a correlation between the number of employees needed for safe and reliable operation at a unit and that unit's capacity factor (CF) or unit availability data. In fact, use of any such linkage as proxies for the number of employees is not correct. Equipment and units operating at a reduced CF still require approximately the same number of skilled shift workers as units are essentially "on-call" to operate on the demand of ISO-NE. Because a unit can be called upon to operate anytime by ISO-NE, Operations must be ready to start or operate a unit at all times. This commitment requires a minimum shift staffing level. However, with reduced capacity factors, PSNH has been able to reduce overtime since full shift complements need not be maintained at all times as in the past. This is the case at all PSNH facilities.

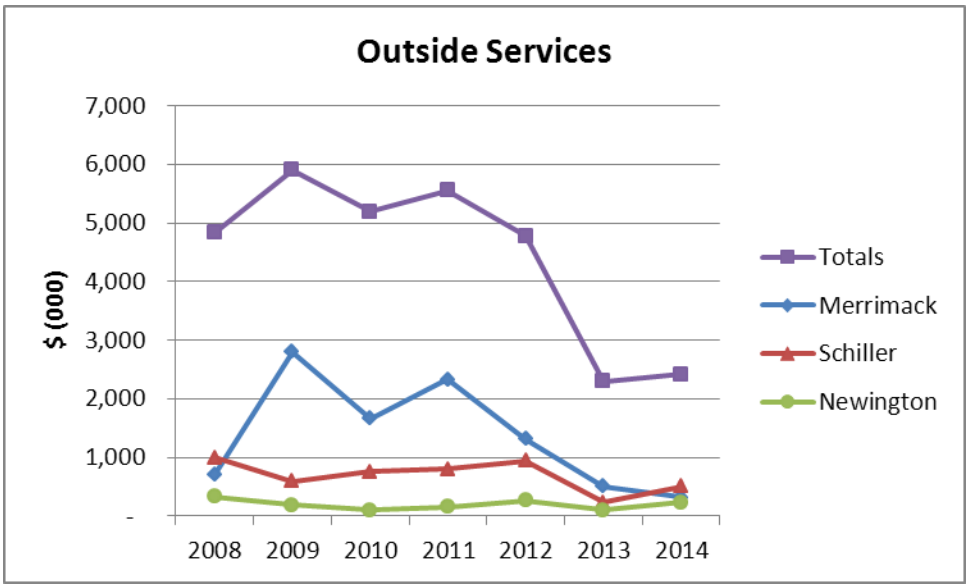
2.1.2 Materials and Supplies



Note- "Totals" in the graph above includes the fossil plants listed as well as hydro, staff, generation maintenance and Wyman.

With reduced planned maintenance and forced outage exposure as well as with targeted repairs during off-line periods, much less materials, parts, lubricants, etc. are used. Other items that fall into this grouping would be certain chemicals and consumables including employee items such as gloves, safety gear, etc. In preceding major planned outage years, this budget category could be as much as $20 million. Current consumption budgets are significantly reduced.

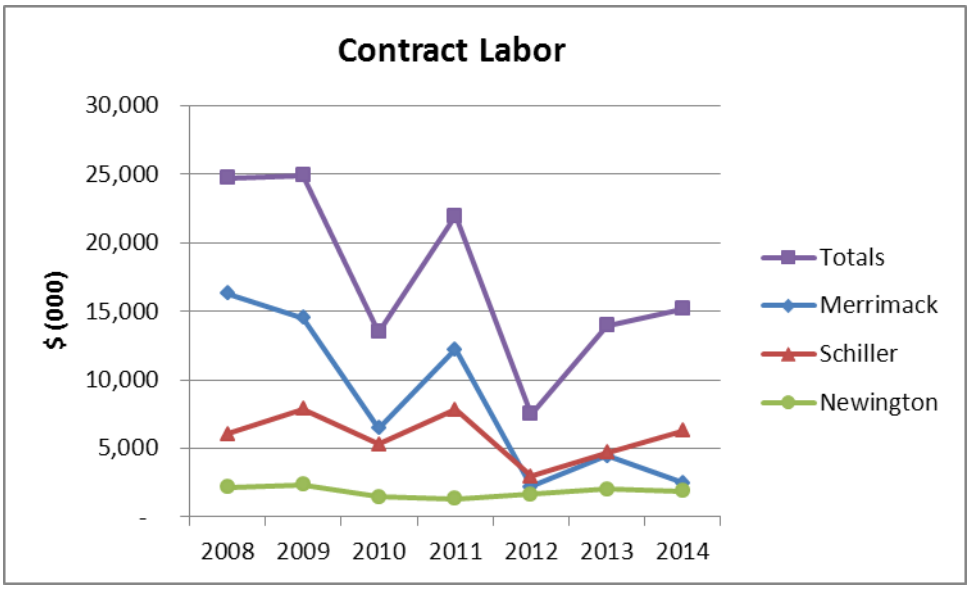
2.1.3 Outside Services



Note- "Totals" in the graph above includes the fossil plants listed as well as hydro, staff, generation maintenance and Wyman.

Outside services are primarily for professional support of targeted work such as targeted non-destructive testing and analysis, specialty engineered solutions to specific problems, chemistry and water quality management consultants, civil and other engineering disciplines, experts, training, etc. These efforts are typically short in duration and require expertise not possessed by PSNH's staff.

2.1.4 Contract Labor

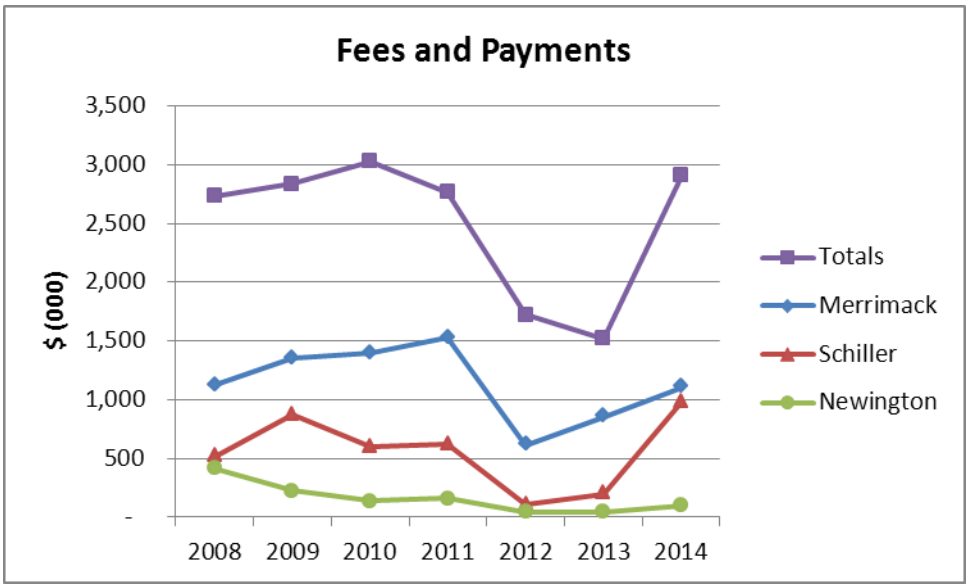


Note- "Totals" in the graph above includes the fossil plants listed as well as hydro, staff, generation maintenance and Wyman.

These charges are generally for building trades craft personnel. This includes boiler makers, electricians, mill wrights, etc. who perform hands-on physical work. This work occurs primarily during planned maintenance outages and also at other times throughout the year (forced outages, specific high manpower tasks, work requiring the special skills, etc.). 2012 was an all-time low in this category with 2013 higher but still much lower than prior years. 2013 work is currently planned to include a small increase in maintenance which cannot be absorbed by employees.

Other essential services in this category include insulation repairs, security, scaffolding, building maintenance, etc.

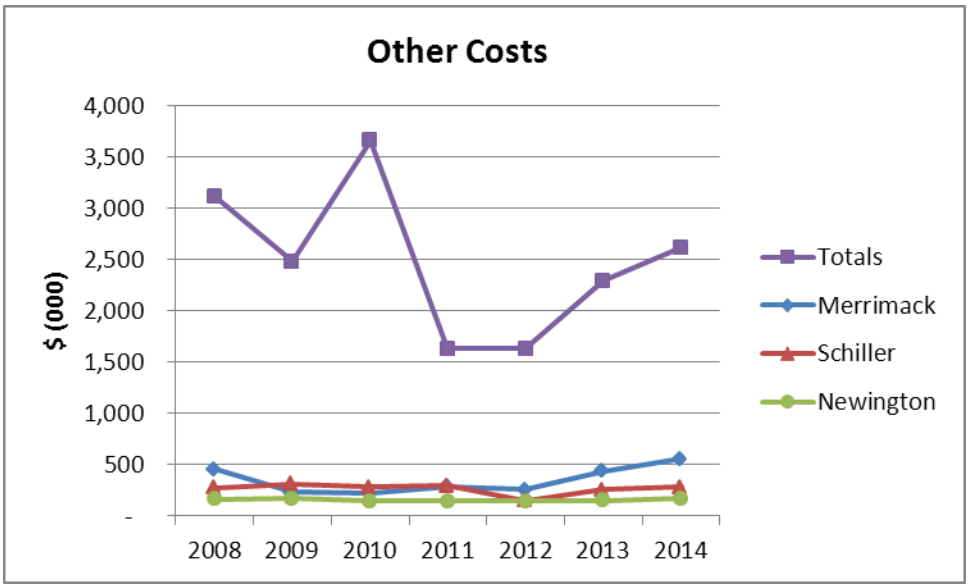
2.1.5 Fees and Payments



Note- "Totals" in the graph above includes the fossil plants listed as well as hydro, staff, generation maintenance and Wyman.

This category is for permits and other payments such as State water use fees and State air emissions fees, which is the largest annual item in this category. Specifically, the increase in 2014 reflects the State's higher air emission rates. Other expenses include miscellaneous dues, EPRI fees, etc.

2.1.6 Other Costs



Note- "Totals" in the graph above includes the fossil plants listed as well as hydro, staff, generation maintenance and Wyman.

Costs in this category include employee expenses, vehicle fees, and rents and leases.

2.2 CAPITAL BUDGET REVIEW

As with reduced planned maintenance work due to reduced capacity factors, there are also reduced capital expenditures. Units are in reasonably good condition and with less wear and tear; less capital investment is necessary.

Table No. 4
Capital Costs

2011 Capital Actual	
Location	**Budget ($ X 1,000)**
Merrimack	6,994
Schiller	6,534
Newington	1,056
Hydro	8,922
Staff, Wyman & Gen. Maint.	106
Total excluding CAP	23,611

In 2011, targeted outages were conducted on fossil units based on equipment condition or other determinant factors in order to ensure safe, reliable, efficient, and compliant operations. Tie-in outages occurred with the Merrimack units and the Clean Air Project so reliability focused work was a priority – no Scrubber costs are included in these actual expenditures. Schiller 5 had a large planned outage after having the wood boiler operating for five years. The equipment installed and/or replaced included valves, expansion joints, load centers, conveyor elements, boiler elements, chutes, and hoppers, motors, pumps, etc. Also in 2011, significant FERC-required structural work was completed on the Ayers Island Hydro Station dam as well as other tasks in the hydro fleet.

Table No. 5
Capital Costs

2012 Capital Actual	
Location	**Budget ($ X 1,000)**
Merrimack	4,111
Schiller	1,819
Newington	506
Hydro	734
Staff, Wyman & Gen. Maint.	192
Total excluding CAP	7,363

2012 was a very lean year due to reduced capacity factors and good unit conditions. Funds targeted specific areas where higher risks existed. Equipment installed and/or replaced included tanks, motors, pumps, control equipment, valves, expansion joints, partial roof replacement, tools, and batteries.

Table No. 6
Capital Costs

2013 Capital Budget	
Location	**Budget ($ X 1,000)**
Merrimack	6,276
Schiller	3,158
Newington	480
Hydro	1,593
Staff, Wyman & Gen. Maint.	529
Total excluding CAP	12,036

The 2013 capital budget remains low compared to historical levels and is expected to be below budget at the end of the year. The increase from the record low in 2012 is due to the need to perform targeted work based on observations in 2012. Equipment items monitored include expansion joints, valves, belts, controls for targeted systems, coolers, load centers, etc.

Table No. 7
Capital Costs

2014 Capital Budget	
Location	**Budget ($ X 1,000)**
Merrimack	6,033
Schiller	3,358
Newington	500
Hydro	2,567
Staff, Wyman & Gen. Maint.	101
Total excluding CAP	12,559

The 2014 capital budget again remains low much like 2013. There is an increase from the record low in 2012 and will complete targeted work for reliability and efficiency. The increase in Hydro's capital budget is associated with planned work on the Amoskeag Unit 1 Generator. The 2014 budget will continue to be reviewed and adjusted based on planning and operations.

2.3 Performance Factors and Impact on Costs

PSNH Generation tracks a number of performance factors to assist in planning efforts. Some of these factors include availability during the 30 highest market-priced days and equivalent availability factor, capacity factors, and days of operation by the units. Each indicates important aspects that need to be considered during planning, maintenance and operations.

Below is a summary of the units' availability during the 30 highest market-priced days over the last three years. Generation targets and completes work to best position the units during high market-priced day as the importance is recognized of being available when customers' exposure to market prices is greatest.

Unit	30-Day Availability (Percent)		
	2010	2011	2012
MK1	99.2	99.3	99.6
MK2	90.7	89.8	99.5
NEW1	95.2	96.2	99.6
SCH4	97.4	99.1	96.6
SCH5	80.5	96.2	96.3
SCH6	98.6	99.9	100.0
FLEET	93.8	94.6	98.2

Similar to the 30 highest market-priced days availability, overall availability is also an indicator of appropriate targeted spending. Below is a summary of the units' equivalent ability factor percentage over the last three years.

Unit	SCC (MW)	Equivalent Availability		
		2010	2011	2012
MERRIMACK 1	108	85.4	79.8	86.3
MERRIMACK 2	330	86.8	84.0	74.5
NEWINGTON 1	400	96.2	93.7	95.3
SCHILLER 4	48	87.1	89.6	83.6
SCHILLER 5	43	86.5	83.9	91.6
SCHILLER 6	49	97.0	91.8	90.2
PSNH FLEET	978	91.0	88.1	86.4

Capacity factors are also reviewed to assess hours of operation. Additionally, days of operation, or unit starts, are monitored to indicate not only how the units provide daily value, but also the wear and tear of cyclic operation.

The following summarizes the annual capacity factor over the last three years.

Annual CF (%)		2010	2011	2012
Merrimack I		67.8	57.9	34.5
Merrimack II		68.9	47.9	28.3
Schiller 4		53.9	28.8	11.2
Schiller 5		84.1	78.3	89.5
Schiller 6		52.3	25.3	11.2
Newington		6.4	3.6	2.0

In 2013, as of September 21, it is noteworthy that all the units have been running greater than initial modeling predicted, as is illustrated below.

2013	Actual CF (as of 9/21)	Annual Planned CF	Days of Operation (as of 9/21)
Merrimack I	41%	32%	120
Merrimack II	41%	30%	122
Schiller 4	9%	23%	111
Schiller 5	80%	90%	244
Schiller 6	8%	21%	90
Newington	3%	3%	34

Generation tracks the number of days the units operate as this identifies the possible higher degree of cycling operation which can create new and unique ‘wear and tear’ despite reduced capacity factors

Increased cycling of the units provides insight into how and when units provide the most value to customers. Unit flexibility is yet another factor considered which can increase its value to the power system while having a range of operational and cost impacts.

2.4 Industry Data Comparison *(new)*

As follow-up to discussions at the December 18, 2012 hearing, PSNH provides the following comparative analysis.

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COMPARATIVE ANALYSIS OF PSNH'S OPERATING AND MAINTENANCE EXPENSES FOR ITS FOSSIL GENERATING STATIONS VS. AVAILABLE INDUSTRY DATA

Introduction

This document reviews the operating and maintenance expenses for PSNH's three fossil fueled generating stations and compares them to published industry averages. The comparative analysis is somewhat qualitative due to the nature of the data available. Data sets are from industry wide national surveys which are not adjusted for items such as, geographic location, labor type (bargaining vs. non bargaining), plant age, specific technology type etc. Regional and national organizations have existed in the past which fostered sharing of data and experiences. However, these groups generally do not exist currently since electric industry restructuring took place in the 1990 to 2005 time period.

Operating and Maintenance Costs

One standard industry practice available for measuring a power generating facility's operating and maintenance (O&M) cost efficiency is to evaluate the costs on a per unit output or capacity basis. Published data is available through government agencies and private groups that present these metrics over a broad industry range. Published metrics typically come in two forms; on a cost per unit production basis, $/MWh or on an cost per unit rating or $/kW–yr. Both metrics are meaningful but tell a slightly different story depending on the operating history of the facility and how each company reports its data.

O&M costs are typically divided into two categories, fixed and variable. Variable O&M costs are evaluated on a unit production basis ($/MWh) while fixed O&M costs are evaluated on a unit rating basis ($/kW–yr). Evaluating costs on a unit production basis ($/MWh) is more meaningful for base loaded facilities with high capacity factors. On the other hand, for units with low capacity factors, the second metric is more meaningful.

Generating units with lower capacity factors typically operate only during high power demand periods. However, these units must incur fixed costs throughout the year even though the units may not be operating. A good example of this would be labor; whether a unit operates or not the same labor force must be available to run the unit should it be called on by the Independent System Operator. Evaluating a unit's fixed O&M costs and comparing to an industry average on a $/kW-yr basis can be used to evaluate how different generators align with their peer group for managing fixed costs.

Generating units with high capacity factors, or base loaded units, are similarly compared. However, for these units, variable costs become more predominant and when evaluating them against their peer group the $/MWh metric is more useful. An example of a variable cost is plant chemicals. As unit production (MWh) increases, likewise the chemicals consumed increases. Fuel, the largest component of a unit's variable cost, is typically shown as a separate variable cost metric from the other combined variable costs.

The U.S. Energy Information Administration (EIA) publishes projections for O&M costs on a regular basis. In a report titled Updated Capital Cost Estimates for Electricity Generation Plants the metrics are provided on both a $/MWH and $/kW-yr basis. An excerpt from the 2010 report is shown in Table 1.

When comparing metrics between generation facilities and published data some caution should be applied. Metrics are more meaningful when they are used to compare like facilities. Differences such as fuel type, plant design type, plant age, multi-unit facilities with shared common costs, and location must be taken into consideration when comparisons are made. However, it is typical for published data to include fuel type and plant design categories only no specific locational data. Also, the metrics are presented as average values across the North American power generation industry.

Technology	Fuel	Nominal Capacity	Nominal Heat Rate (Btu/kWh) (2)	Capital Cost ($/kW) (3)	Fixed O&M ($/kW-yr) (4)	Variable O&M ($/MWh) (5)
Advanced Pulverized Coal	Coal	650,000	8,800	3,167	35.97	4.25
Advanced Pulverized Coal	Coal	1,300,000	8,800	2,844	29.67	4.25
Advanced Pulverized Coal with CCS	Coal	650,000	12,000	5,099	76.62	9.05
Advanced Pulverized Coal with CCS	Coal	1,300,000	12,000	4,579	63.21	9.05
NGCC	Gas	540,000	7,050	978	14.39	3.43
AG-NGCC	Gas	400,000	6,430	1,003	14.62	3.11
Advanced NGCC with CCS	Gas	340,000	7,525	2,060	30.25	6.45
Conventional CT	Gas	85,000	10,850	974	6.98	14.70
Advanced CT	Gas	210,000	9,750	665	6.70	9.87
IGCC	Coal	600,000	8,700	3,565	59.23	6.87
IGCC	Coal	1,200,000	8,700	3,221	48.90	6.87
IGCC with CCS	Coal	520,000	10,700	5,348	69.30	8.04
Advanced Nuclear	Uranium	2,236,000	N/A	5,339	88.75	2.04
Biomass Combined Cycle	Biomass	20,000	12,350	7,894	338.79	16.64
Biomass BFB	Biomass	50,000	13,500	3,860	100.50	5.00
Fuel Cells	Gas	10,000	9,500	6,835	350	0
Geothermal – Dual Flash	Geothermal	50,000	N/A	5,578	84.27	9.64
Geothermal – Binary	Geothermal	50,000	N/A	4,141	84.27	9.64
MSW	MSW	50,000	18,000	8,232	373.76	8.33
Hydroelectric	Hydro	500,000	N/A	3,076	13.44	0
Pumped Storage	Hydro	250,000	N/A	5,595	13.03	0
Onshore Wind	Wind	100,000	N/A	2,438	28.07	0
Offshore Wind	Wind	400,000	N/A	5,975	53.33	0
Solar Thermal	Solar	100,000	N/A	4,692	64.00	0
Photovoltaic	Solar	7,000	N/A	6,050	26.04	0
Photovoltaic	Solar	150,000	N/A	4,755	16.70	0

Tab. 1 From EIA Report - Updated Capital Cost Estimates for Electricity Generation Plants – November 2010

Using O&M cost metrics from Table 1 and the costs presented in Table 1 and Table 2 of the report titled "Review of Costs PSNH Generation" in Docket No. DE 12-292, the following Table is made to compare PSNH generating plants cost metrics to industry averages. Discussion on how the PSNH O&M cost metrics were developed is contained in the table notes.

	Average PSNH 2011 & 2012		EIA Data	
Station	Variable O&M ($/MWh) [1]	Fixed O&M ($/kW-yr) [2]	Variable O&M ($/MWh) [3]	Fixed O&M ($/kW-yr) [3]
Merrimack	3.96	36.52	4.25	38.00
Schiller	5.00	88.80	4.84	86.30
Newington[4]	4.27	14.09	4.25	38.00

1. Average variable O&M cost metrics were developed for each station using ISO NE Generating Availability Data System (GADS) from 2011 and 2012, and the O&M cost data presented in Docket No. DE 12-292. Accounting of O&M costs are not tracked on a variable and fixed basis. For the purposes of this evaluation it is assumed that the variable costs are comprised of 50% of the totals of; materials and supplies, contract labor, outside services, fees and payments, and other. The values presented on a $/MWh basis were calculated by dividing the GADS total MWh generated by the facility for 2011 and 2012 by the variable costs for the years 2011 and 2012.

2. Average fixed O&M cost metrics were developed for each station using ISO NE Generating Availability Data System (GADS) data from 2011 and 2012 and the O&M cost data presented in Docket No. DE 12-292. Fixed costs are comprised of; 100% NU Labor and 50% of the totals of; materials and supplies, contract labor, outside services, fees and payments, and other. The values presented were calculated by dividing the total the fixed costs for the years 2011 and 2012 by the stations gross rating.

3. EIA data for Schiller is adjusted based on the unit No. 5 biomass boiler and was apportioned based on Unit 5's contribution to total station output. For example, EIA data for a biomass BFB unit like Schiller's Unit 5 is 100.5 ($/kW –yr). This number is adjusted down by the amount Units 4 and 6 contribute to the stations total capacity factor. Of the total MWhs generated by Schiller station, about 78% is attributable to Unit 5 with Units 4 and 6 contributing the remaining 22%.

4. Newington station's fixed costs are comprised of; 100% NU Labor and 85% of the totals of; materials and supplies, contract labor, outside services, fees and payments, and other. The

85/15 split better reflects the stations low capacity factor and assumes the majority of the O&M costs are not attributable to the station operating.

Current programs in place and established in 2011 and 2012 regarding cost reductions, sharing resources between facilities, significantly reduced contractor use. Conducting work on straight time during periods of low demand/low replacement power costs, etc. will continue to drive Schiller costs downward going forward.

Discussion of Results

Merrimack Station

For the years average of 2011 and 2012 the variable O&M costs for Merrimack station were below the industry average by 6.8 %. The stations fixed O&M costs were below the industry average by 3.9%. It should be noted that these values are a snapshot in time and will vary according to maintenance schedules. Major equipment overhauls and plant outages that occur at a frequency of 4 to 6 years can skew the data either positively or negatively. Based on higher capacity factors in prior years, it can be concluded that Merrimack Station would have had a more positive comparison, even if higher O&M costs were incurred.

Schiller Station

For the years average of 2011 and 2012 the variable O&M costs for Schiller station were slightly above the EIA data by 3.2 %. The stations fixed O&M costs were slightly above the EIA data by 2.8%. The closest EIA data available used to make this comparison is the 650 MW Pulverized Coal (PC) data and the biomass bubbling fluidized bed (BFB). The biomass unit closely matches the Unit 5 plant at Schiller station however, there is a significant difference in plant size when comparing units 4&6 (2X50 MW) to the single 650 MW EIA unit. When reviewing O&M data, economies of scale should be taken into consideration as units with smaller outputs will tend to have higher costs on a unit output basis when compared to larger units. It should also be noted that these values are a snapshot in time and can vary according to maintenance schedules. Major equipment overhauls and plant outages that occur at a frequency of 4 to 6 years can skew the data either positively or negatively. Current programs in place and established in 2011 and 2012 regarding cost reductions, sharing resources between facilities, significantly reduced contractor use, conducting work on straight time during periods of low demand/low replacement power costs, etc. will continue to drive Schiller costs downward going forward.

Newington Station

For the years average of 2011 and 2012 the variable O&M costs for Newington station were above the industry average by 0.5% and the stations fixed O&M costs were below the industry average by 169%. It should be noted that these values are a snapshot in time and will vary according to maintenance schedules. Major plant outages and equipment overhauls that occur at a frequency of 4 to 6 years can skew the data either positively or negatively.

Conclusion

Merrimack and Schiller Stations O&M costs are essentially fully in line with industry data available. Newington Station's fixed O&M costs are well below industry published data and its variable costs are in line with the industry data.

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SECTION 3: ONGOING and EMERGING ISSUES

3.1 ISO-NE Recent Developments

ISO-NE continues to address the issue of New England's increasing dependence on natural gas and is reviewing and assessing long term solutions to the associated reliability concerns. However, in the near term ISO-NE is focused on the winter 2013-2014 period and undertaken the Winter Reliability Program.

Winter Reliability Program

As noted in testimony, due to the region's experience during the winter of 2012-2013 with constrained natural gas supply, ISO-NE developed its Winter 2013-2014 Reliability Program. The program consists of four components: demand response, oil inventory service, incentives for dual fuel units, and market monitoring changes. As stated in ISO-NE's filing to FERC on June 28, 2013, these components are time-limited, discrete, out-of-market solutions. The program targeted the equivalent of up to 2.4 million MWh of energy in oil inventory and demand response over the term of December 1, 2013 to February 28, 2014.

In support of this program, PSNH submitted multiple bid blocks to provide oil fired generation from Newington Station. The bidding process is now complete. ISO-NE has completed its evaluation, notified participants of the results/awards, and filed with FERC for approval of those awards. FERC approval of the awards is still pending as of September 25, 2013. FERC has approved the program itself, with one significant revision from that proposed by ISO-NE. The revision was to allocate costs of the program to energy load rather than transmission load based on cost causation principles. This revision occurred subsequent to the submission of binding bids by participants.

The bidding results are awaiting FERC approval, with ISO-NE proposing awards equivalent to approximately 1.995 million MWh at a price of $78.8 million, for the three month period. The cost allocation to ES customers is estimated to be approximately $2.4 million. Absent PSNH participation, this cost would be higher as a more expensive proposal would have been taken, assuming the same amount of energy was awarded. PSNH was awarded approximately 100,000 MWh (215,000 barrels) of oil inventory

service at Newington Station for a price of $4.8 million, for the three month period. All of the above is awaiting FERC approval.

Overreliance on Natural Gas

With the Winter Reliability Program efforts underway, ISO-NE continues to focus on the region's long term challenge of increased dependence on natural gas. FERC Commissioner John Norris and others have cautioned against leaning too heavily on a single fuel source for power generation. A recent New England States Committee on Electricity report prepared by Black and Veatch Corp. said that without new gas infrastructure, New England could expect constraints for significant periods, "sometimes exceeding 60 days per year for some sub-regions." This report confirmed that both "Short-term and long-term solutions are needed to relieve the natural gas market constraints in New England... solutions to New England's natural gas infrastructure constraints must come in the form of large-scale infrastructure improvements.."

PSNH Generation maintains high reliability and fuel inventory to support ISO-NE during these challenging periods.

3.2 Renewable Power: Berlin Biomass Station

PSNH Generation is aware that Berlin Biomass Plant has reported to the Company that it will be coming online Nov 18, 2013. We do not anticipate that this will impact the units' operations and budgets.

3.3 Operations of the Plants and Migration

At this time, 2014 unit operation is expected to be similar to 2013 operations. The budget information provided for 2014 is consistent with that operation. And as stated previously, the units and all the equipment remain "on-call" to operate on the demand of ISO-NE.

SECTION 4: SUMMARY AND CONCLUSIONS

The energy marketplace has changed dramatically in the last ten years. PSNH's generation fleet provides a known backstop to volatility and higher energy prices. Concern for market stability is increasing. Numerous industry and regional signals identify risks associated with regional over reliance on natural gas as noted above.

PSNH Generation provides cost effective energy and customer value with reliable and efficient energy service to its customers as has been demonstrated in numerous reviews by the Commission of PSNH's operations, maintenance, and decision making over many years. With changes in market forces and market conditions due to economic changes in the country and the world, as well as the continuing evolution of gas markets, PSNH has adjusted its management of its fleet to appropriately suit the needs of customers. In doing so, PSNH has adjusted its capacity factors, expenses, and staffing in order to continue to provide ongoing customer value at the lowest possible cost. Appropriate efforts and adjustments will continue going forward. As energy market conditions change, PSNH plants are being maintained and are ready to serve at a full range of operating scenarios.