Exhibit MDC-1 Resume of Michael D. Cannata, Jr., PE

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Michael D. Cannata, Jr. | Senior Consultant, Accion Group, Inc.
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As the former Chief Engineer of the New Hampshire Public Utilities Commission and a former managing engineer with the Public Service Company of New Hampshire in transmission and generation planning, energy management, and system operations, Mr. Cannata supports Accion's team with his expert knowledge of power system studies and planning and interconnection analysis. Before joining Accion Group, Mr. Cannata served as a technical advisor to the Maine Public Utilities Commission, the Vermont Public Service Board, the Kentucky Public Service Commission, and the District of Columbia Public Service Commission regarding the public necessity and convenience for a multitude of 345 kV, 230 kV, 161 kV, 138 kV, 115 kV, and 69 kV facilities. Additionally, Mr. Cannata has conducted management audits of major utility organizations, executed prudence reviews of major fossil and nuclear plant outages, and served as the prime architect for one state's heavily litigated electric utility restructuring settlement.

Experience

Chief Engineer, New Hampshire Public Utilities Commission
Director, Power Pool Operations, Public Service Company of New Hampshire
Manager, Computer Department and System Planning, Public Service Company of New Hampshire
Senior Consultant, Liberty Consulting Group
Management audits of major utility organizations
Investigations of major system outages
State siting decision maker
State Office of Emergency management decision maker
Prudence reviews of major fossil and nuclear plant outages
Utility merger analyses
Prime architect for one state's heavily litigated electric utility restructuring settlement
Principal technical and analytical member of the Seabrook Nuclear Plant sale
Technical advisor for international DC interconnection facilities
Core participant in the resolution of a major utility bankruptcy

Major Clients

Alabama Power Company
Arizona Public Service Commission
Confidential Investment Bankers
Delaware Public Service Commission
D.C. Public Service Commission
Illinois Commerce Commission
Kentucky Public Service Commission
Maine Public Utilities Commission
Maryland Public Service Commission
New York Public Service Commission
NH Public Utilities Commission
Nova Scotia Utility and Review Board
Office of the MA Attorney General
Ohio Public Utilities Commission
Reliant Energy Corporation
Vermont Public Service Board

Industry Specialization

Analysis of Utility Reliability, Safety, and Operating Practices
Economic Evaluations
Expert Testimony
Generation Planning
Generation Plant Siting
Mergers and Acquisitions
Non-Utility System Interconnections
Power System Operations
Risk Management
System Reliability Analyses
Transmission and Gas Line Siting
Transmission Planning
Utility Acquisitions
Vegetation Management

Education

MBA, Northeastern University
MSEE Power Systems, Northeastern University
BSEE Power Systems, Northeastern University
Professional Engineer – New Hampshire #5618

Relevant Experience

Audit and Operations Review

Lead Consultant for Liberty Consulting Group's review of the transmission system of Nova Scotia Power for The Nova Scotia Utility and Review Board. Liberty's review examined (1) system maintenance, inspection, structural design, materials, staffing, and related matters, (2) system planning, operations, system design, lessons learned, and other matters, and (3) utility communications, call center operations, staffing, outage management system, lessons learned, and related matters after the collapse of multiple transmission lines in November 2004.

A lead investigator in the review of Maryland utility responses to identify infrastructure and staffing increases required and their costs to improve system resiliency during major events for the Maryland Public Service Commission.

Assisted the Delaware Public Service Commission in the analysis of the need for major capital expenditures related to 2012 and 2013 reliability improvement projects in the 2012-2013 Delmarva Power and Light rate case.

Lead Investigator in the review of the response of Massachusetts Electric Company to the major snowstorm that occurred in October 2011 for the Office of the Massachusetts General.

Assisted the New Hampshire Public Utilities Commission in its review of the response of four major electric companies to major storms occurring in 2011.

Lead investigator into the reliability of the Potomac Electric Power Company distribution system and the quality of service it provides to its customers for the Maryland Public Service Commission.

Lead Investigator in the management audit of Consolidated Edison Company of New York reviewing adequacy of multi-area transmission planning and resource adequacy within the multi-area system for the New York Public Service Commission, including review of the electric and gas system designs.

Lead Investigator monitoring Commonwealth Edison's implementation of T&D system reliability improvement recommendations resulting from major system outages for the Illinois Commerce Commission.

Lead Investigator in the prolonged outage of Ameren T&D facilities following severe wind and ice events in 2006 for the Illinois Commerce Commission.

Lead Investigator monitoring Ameren's implementation of T&D system reliability improvement recommendations resulting from major system outages for the Illinois Commerce Commission.

Lead Investigator in the investigation of transmission grid security in Illinois after the August 2003 blackout for the governor's blue ribbon committee.

Lead Investigator reviewing the operation and outage of the fossil power plants of Arizona Public Service Company for the Arizona Public Service Commission.

Lead Investigator reviewing the operation and outage of the fossil power plants of Duke Energy – Ohio for the Ohio Public Utilities commission.

Lead Investigator in the in-depth root cause analysis of a fire at a major Commonwealth Edison substation for the Illinois Commerce Commission.

Lead Investigator of the reliability of the T&D systems of four electric utilities in Maine.

Lead Investigator in the review of distribution and transmission practices at Alabama Power and Georgia Power Company.

Served as the principal technical member of the Seabrook nuclear unit sale team acting for the New Hampshire Public Utilities Commission.

Lead Investigator in prudence reviews of major fossil and nuclear plant outages for the New Hampshire Public Utilities Commission.

Investigated the causes of overlapping unit outages at a major Reliant generation facility.

Dispute Resolution

Prime architect of the settlement between the State of New Hampshire and Public Service Company of New Hampshire (PSNH) that ended years of litigation and allowed statewide competition in the electric industry to proceed.

Re-drafted the State of New Hampshire Bulk Power Siting Statute and facilitated resolution of widespread legislative tensions.

Renewable Energy Projects

Lead Investigator reviewing the adequacy of system interconnection requirements of a major renewable fuel resource for the Nova Scotia Utility and Review Board.

Restructuring

Advisor for the New Hampshire Public Utilities Commission in the merger of National Grid and Key Span and the sale of Verizon assets to Fair Point Communications.

Principal technical and analytical member in the Seabrook Nuclear Unit sale team acting for the New Hampshire Public Utilities Commission.

Core participant in the merger/acquisition team activities culminating in the corporate reorganization of PSNH. Recognized and developed a successful employee retention program used during the acquisition.

Strategic Energy Planning

Evaluated the appropriateness of the proposed Storm Fund Adjustment Factor and the Inspection and Maintenance Program Basis Service Adjustment Mechanism for Power Option, a load aggregator in Massachusetts Electric Company's first delivery rate case in 10 years.

Technical advisor to the Maine Public Utilities Commission, Vermont Public Service Board, Kentucky Public Service Commission, and the District of Columbia Public Service Commission regarding the public necessity and convenience for a multitude of 345 kV, 230 kV, 161 kV, 138 kV, 115 kV, and 69 kV facilities. Included in these many engagements were the Maine Power Reliability Project consisting of over 350 miles of 115 kV and 345 kV facilities.

Advisor to the Commission on utility system and operational issues including those of alternative energy generation.

Transmission and Distribution

Responsible for the operation and dispatch of PSNH transmission and generation facilities through the New Hampshire Electric System Control Center.

Developed real time integrated transmission system loading capabilities for the New Hampshire Electric System Control Center.

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Utility Planning and Management

Managed a professional staff of engineers and analysts engaged in investigations regarding safety, reliability, emergency planning, and the implementation of public policy in the electric, gas, telecommunications and water industries.

Decision-maker on the Site Evaluation Committee responsible for siting major electric and gas production and transmission facilities.

Sat as decision maker at the New Hampshire Office of Emergency Management's Emergency Operations Center.

Instrumental in achieving quality of service levels among the highest in Verizon's service territory.

Core Task Force Member for the DC electrical interconnection between Hydro Quebec and the New England Power Pool.

Director of Power Pool Operations and Planning for Public Service Company of New Hampshire (PSNH)

- Represented PSNH at all major relevant national and regional reliability organizations including:
  New England Power Pool - System planning Committee; System Operations Committee; Technical planning and operations task forces conducting regional and inter-regional studies and analyses
  Northeast Power Coordinating Council - Joint Coordinating Council
  Edison Electric Institute - System Planning Committee

Director of System Planning/Energy Management, PSNH

- Coordinated the company's capital planning requirements for generation and transmission. Integrated its load forecasting and energy management activities
- Lead Participant in the development and implementation of response strategies addressing the negative financial impacts associated with the proliferation of non-utility generation
- Ensured that the interconnections of non-utility generation met utility reliability requirements
- Re-designed the corporate budgeting system to allocate available resources by economic and need prioritization
- Driving force in re-directing corporate economic evaluations towards competitive business techniques

Manager of Computer Department and System Planning, PSNH

- Responsible for the Engineering Division's computer applications support and transmission system planning functions
- Principal in the development, design and implementation of the first-in-the-nation application of 345/34.5 kV distribution
- Resolved daytime corporate-wide computer throughput logjam
- Integrated the Engineering Department's computer applications into the corporate computer organization

Registration

Registered Professional Engineer - New Hampshire #5618

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Exhibit MDC- 2 2013 Capacity/Energy Transactions

ACCION GROUP

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2013 Capacity/Energy Transactions

Background

Public Service Company of New Hampshire ("PSNH") retains load serving responsibility for customers who have not selected a competitive supplier. PSNH's monthly peak load for 2013 ranged from 550 MW in October, to 885 MW during July. On-peak monthly energy ranged from 144 GWh in September to 220 GWh in January, and off-peak monthly energy ranged from 127 GWh in October to 202 GWh in January, as highlighted below.

During 2013, PSNH met part of its total system need by purchases from other suppliers including contracts. In 2013, these external supplies ranged from 1% of monthly on-peak energy requirements in February to 72% during October. Off-peak supplies from the market in 2013 ranged from 1% of system need in February to 66% in October. For the year, the market supplied a total of 34% of PSNH's on-peak energy requirements and 30% of its off-peak requirements, as highlighted below. Market supplied on-peak energy decreased 9%, and market supplied off-peak energy decreased 7% in 2013 compared to 2012.

Source of 2013 System Monthly Needs (1)

Period	System Peak (MW)	System Monthly Needs (GWh)		Market Supply (Percentage)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
January	828	220	202	4	2
February	784	191	179	1	1
March	703	180	183	3	9
April	614	164	140	47	40
May	684	157	136	46	36
June	790	157	166	41	37
July	885	214	190	27	23
August	691	184	154	58	58
September	775	144	145	60	57
October	550	157	127	72	66
November	635	155	158	61	50
December	748	188	186	17	13
Total for 2013	**---**	**2,109**	**1,966**	**34**	**30**

1 - Totals may not equal 100% due to rounding.

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Accion Group, Inc. ("Accion" or "Accion Group") notes that the market supplied 27% of PSNH's on-peak energy and 18% of off-peak energy for 2010. Those percentages increased to approximately 49% and 47%, respectively, for 2011, and were approximately 43% and 37% for 2012. Low gas prices resulted in very low market energy prices through the Independent System Operator – New England ("ISO-NE"), resulting in many times when PSNH base-load coal units were placed in economic reserve or run at reduced capability thus resulting in a greater dependence on energy supplied from the market. Higher market prices during winter months and increased load migration accounted for the decrease of market supplied on-peak energy to 34%, and market supplied off-peak energy to 30%, in 2013.

PSNH's Sources of 2013 Energy and Capacity

In 2013 and at summer ratings,[6] PSNH owned approximately 533 MW of coal-fired generation with four units at two stations, 419 MW of oil-fired generation from two units, 57 MW of hydro-electric generation from nine stations, 43 MW of wood-fired generation from a single unit, and 83 MW of combustion turbine generation from five units at four locations. PSNH also purchased 3 MW of wind from a single facility, 33 MW from various Public Utilities Regulatory Policy Act ("PURPA")-mandated purchases, 59 MW from a single biomass plant, and 27 MW (no capacity[7]) from Independent Power Provider ("IPP") and buyout replacement contracts.[8] The PSNH portfolio totals approximately 1,256 MW of summer capability, and 1,290 MW of winter capability.[9]

PSNH must meet its 2013 share of the ISO-NE monthly capacity requirements, which ranged from 1,041 MW in September to 1,234 MW in January. The difference between PSNH resources and the ISO-NE monthly capacity requirement, including reserve requirements, must be met through supplemental capacity purchases. The market supplemental capacity requirement purchases varied from (192) MW during October to 93 MW in January.[10] PSNH also received variable monthly capacity credits from the Hydro Quebec interconnection.

Load obligation requirements remained relatively easy to forecast in 2013 as higher winter prices gave way to lower and more stable off season energy prices, resulting in reasonably predictable customer migration. At the beginning of January, approximately 504 MW of PSNH's large customers (46% of PSNH's monthly load) obtained their power supply from the market or self-supplied their energy requirements. By the end of July, the load obligation loss was 688 MW (53 % percent of monthly load). The energy related to customer migration was 298 GWh in February and 443 GWh in

[6] In New England, generating units have winter and summer capability ratings. The summer ratings are generally lower to reflect higher ambient and cooling water temperatures.

[7] The capacity and capability of a generating unit are different. Capacity refers to a proven rating of a generator under specific conditions while capability refers to the ability of a generator to produce power under actual operating conditions.

[8] These figures do not include unit contingent contracts.

[9] The units that are owned by PSNH, along with capacity under firm contract are, collectively, referred to as "PSNH Generation" or "own units" in this Exhibit.

[10] In July 2010, the ISO-NE revised its capacity requirements so that only the capacity needed for reliability would be supported.

July. For the 2013 calendar year, capacity associated with load migration totaled 5,993 MW-months (52% of annual amount) and energy associated with customer migration totaled 4,379 GWh (52% of annual amount). Customer migration ranged between 442 MW and 595 MW on a monthly basis due to higher winter energy prices and relatively stable energy prices for the remainder of the year. Accion Group notes that in its 2013 Energy Service ("ES") filings (including the update), PSNH was using the then-current level of migration occurring at the time of each filing. Those assumptions were reasonable, taking into account the market prices that existed compared to the PSNH ES rates proposed.

In its ES initial and mid-year forecasts, PSNH modeled that 5,924 MW-months of ES capacity and 4,322 GWh of ES energy from all sources would be necessary to serve ES customers. In actuality, 5,566 MW-months of ES capacity and 4,061 GWh of ES energy were required. Accion believes that this is a reasonable correlation of forecast versus actual values.

To conduct business in the ISO-NE energy and capacity markets, PSNH uses the resources of its parent company, Eversource Energy ("EE"). The table below depicts the number of Full Time Employees ("FTEs") charged to PSNH to participate in the New England market.

Time Sheet Allocation of Wholesale Marketing Department FTEs
(Total/PSNH)

	2010		2011		2012		2013	
Bidding & Scheduling	2.00	2.00	2.00	1.97	2.00	2.00	2.00	1.78
Resource Planning/Analysis	4.00	2.46	4.00	2.34	4.00	2.27	3.00	1.60
Energy & Capacity Purchasing	2.00	0.71	2.00	0.70	2.00	0.78	2.00	0.65
Standard Offer & Default Service Procurement	3.00	0.00	3.00	0.00	3.00	0.00	2.00	0.02
Contract Administration	3.00	0.00	3.00	0.00	3.00	0.00	2.00	0.00
Administrative Support	1.00	0.28	1.00	0.00	1.00	0.02	1.00	0.24
Renewable Power Contracts	---	---	1.00	0.28	1.00	0.23	3.00	0.02
Management	1.00	0.13	1.00	0.09	1.00	0.12	1.00	0.09
Total	**16.00**	**5.59(1)**	**17.00**	**5.38(2)**	**17.00**	**5.12**	**16.00**	**4.39**

1 – Duplicative manpower was required due to the transition of a new manager.

2 – Additional resources were required to support the Least Cost Integrated Planning (LCIRP) and Newington continued Unit Operation (CUO) investigations that continued into 2011.

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PSNH's Management of Energy Procurement

PSNH's energy procurement is managed and coordinated by EE. In 2010, 5.59 FTEs were charged to PSNH, representing an increase of approximately one FTE due to the transitioning of a new department manager.[11] PSNH stated that it expected future FTE allocation to PSNH to be more representative of historic values (i.e., pre-2010 because the duplicate manpower required during the transition of the new manager in 2010 will not be required. In 2011, 5.38 FTEs were charged to PSNH to support the Least Cost Integrated Resource Plan ("LCIRP") and the Newington Continued Unit Operation ("CUO") investigations that continued into 2011. In 2012, 5.12 FTEs were allocated to PSNH. PSNH attributes additional resource requirements for the support of the Alternate Default Energy rate docket (DE 11-216), preparation of renewable power contracts, as well as some LCIRP requirements that continued into 2012. The remaining FTEs were allocated to two other NU subsidiaries that do not have load-serving responsibilities.

During 2013, EE employed the equivalent of 16 FTEs in the Wholesale Marketing Department. In 2013, 4.39 FTEs were allocated to PSNH. PSNH attributes reduction in resource requirements due to the reduction in support of the Alternate Default Energy rate docket (DE 11-216), preparation of renewable power contracts, as well as some LCIRP requirements that continued into 2012. Accion believes that the number of FTEs allocated to New Hampshire does not seem unreasonable given the circumstances.

From an organizational viewpoint, the New Hampshire position reports to a manager in Connecticut. The manager is spending considerable time in the field at PSNH and, according to PSNH' the field time spent was comparable to historic levels.

PSNH's Reliance on Supplemental Supplies

To meet its load responsibility, PSNH requires supplemental on-peak and off-peak (defined by ISO-NE as weekends, holidays, and weekday hours 1-7 and hour 24) energy purchases that change hourly. In 2013, and during on-peak and off-peak periods, purchases varied by period and expected unit operation. PSNH made purchases that were 50 MW block bilateral purchases or multiples thereof (described in the following paragraph) that best fit PSNH's supplemental needs. Accion considers these requirements to be "fixed," as their requirement is based on the assumed absence of specific contingencies occurring, but does include planned unit maintenance. PSNH stated that the unit capacity value used by PSNH includes a reduction in unit capacity factor, reflecting estimated unpredictable forced outages and estimated reserve shutdowns between the planned maintenance periods. The supplemental energy and capacity requirements increase if any part of PSNH's generation portfolio is unavailable when needed to serve load, or if loads are higher than planned due to variations in the weather or customer migration. Likewise, these requirements are reduced when loads are less than planned due to variation in the weather or customer migration. Accion Group considers this portion of the energy supply to be "variable". The approach to the purchase of supplemental supplies was very similar to that employed in 2012 with minor adjustments being made on purchase and sale trigger amounts.

In general, PSNH supplemented its generation with 7 monthly bilateral purchases, 6 weekly bilateral purchases, and daily bilateral purchases to meet the "fixed" portion of its supplemental on-peak requirements and used the ISO-NE spot market combined with daily bi-lateral purchases to meet the "variable" portion of its supplemental requirements. A total of 56 daily bilateral purchases were made in 2013.

Of the 7 monthly bilateral energy purchases, 4 were made for the spring maintenance season in March and April, and 3 were made in June for the fall maintenance season. Of the 6 weekly bilateral energy purchases, 2 were made for the spring maintenance period, 3 were made for the summer load period, and 1 was made for the winter load period. Of the 56 daily bilateral energy purchases, 23 were made during the summer load period.

The table below shows how PSNH's on-peak and off-peak energy requirements were supplied both historically and in 2013 by its own resources and the bilateral and ISO-NE spot markets. Notably, in 2013 PSNH relied less on market energy due to ISO-NE energy prices that were closer to the cost of PSNH units, and load migration which ranged from 45 to 58% of monthly energy requirements. Actual weather and major unit outages can also alter the year-to-year percentages.

Percent Historic and 2013 Supply of PSNH Energy Requirements from PSNH and Market Sources (1)

	PSNH Owned Generation (Percent)		Bilateral and Spot Energy (Percent)	
	On-Peak	**Off-Peak**	**On-Peak**	**Off-Peak**
2009	63	73	37	27
2010	74	82	27	18
2011	63	69	37	31
2012	57	63	43	37
2013	66	70	34	30

1 - Totals may not equal 100% due to rounding.

[11] A new manager was brought into this area in late 2009 due to the then current manager accepting another position within the NU organization.

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The following table shows how PSNH's units supplied PSNH's energy requirements for 2013.

Percent of PSNH 2013 On-Peak and Off-Peak Energy Requirements Supplied by PSNH (1)

Source	On-Peak (Percent)	Off-Peak (Percent)
Merrimack	28	25
Schiller	10	10
Hydro	8	10
IPPs	17	22
Buyout Contracts	2	2
Newington & Wyman (Oil)	1	0
Combustion Turbines	0	0
Bilateral Purchases	24	11
ISO-NE Spot Purchases	10	19
Total	100	99

1 - Totals may not equal 100% due to rounding.

The following table depicts PSNH's historical and 2013 market purchases and their source by percent.

Historical PSNH Supplemental Purchases and Source (1)

	Sup. Purchases (GWh)	LT Bilateral (%)	ST Bilateral (%)	ISO-NE Spot (%)
On-Peak				
2009	1,703	90	3	7
2010	1,011	81	5	14
2011	1,114	43	23	34
2012	1,141	40	18	42
2013	760	47	25	28
Off-Peak				
2009	1,139	85	2	13
2010	564	41	7	52
2011	820	8	15	77
2012	876	12	16	73
2013	611	16	22	62

1 - Amounts may not total to 100% due to rounding.

Historic and 2013 PSNH Supply Approach

Historic Energy Supply

PSNH has historically altered its approach to supply procurement each year to deal with changing market conditions. In 2010, PSNH altered its procurement strategy from the longer term view used in prior years. PSNH used a much shorter term market focus when making its purchases rather than locking in supplemental supply far in advance. During 2010, PSNH's energy purchases were not from any long-term purchases in advance of delivery, except for three 50 MW annual 2010 energy purchases made in 2008, and the Bethlehem and Tamworth unit contingent contracts. Those contracts expired at the end of 2010. Two 50 MW annual 2011 energy purchases also made in 2008 expired at the end of 2011. In 2011, PSNH focused on short-term transactions due to decreasing market prices. PSNH remained focused on the short-term market in 2012, and again in 2013. In 2013, PSNH made no transactions longer than a month and those transactions were made close to the time of projected need.

2013 Energy Supply

In 2013, PSNH remained focused on short-term transactions because of generally low energy prices. Four of the 7 longer-term purchases were made during the spring, and 3 were made during the fall. All short-term transactions were made within a week of scheduled delivery. The very long-term legacy contracts terminated at the end of 2011. In addition, five additional wood IPP contracts which began during 2012 continued throughout 2013.

PSNH conducts biweekly phone calls that include discussion with the generating stations, fuels, operations, and bidding/scheduling personnel. Plant personnel keep capacity/energy planning informed of impending developments at the plants.[12] PSNH used to view Newington as the major unit on its system that interacts with the market. Other former base-load coal units at Merrimack and Schiller have now assumed that role due to the low market energy prices that continued into 2013. All other owned units are either hydro, wood, or long-term resources that are expected to be economic, or must-take contracts,[13] or peaking units that are rarely expected to run. PSNH's net monthly on-peak energy requirements were 0 to 84 GWh of bilateral purchases, and less than one to 53 GWh of spot market purchases. PSNH's monthly off-peak net energy requirements were 0 to 40 GWh of bilateral purchases, and 1 to 62 GWh of spot market purchases. PSNH determines its incremental energy needs from the market based on actual expected weather and actual unit operational conditions rather than the forecasted average weather in the energy forecast.

PSNH made purchases based on monthly analyses that involved modeling hourly forecasts by month, including a hydro schedule, hourly load forecast, IPP forecast, and its own resources. PSNH modeled its own resources as follows: Combustion turbines and Wyman-4 were excluded because

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[12] Accion monitored one of those calls in December and one of the calls in January.

[13] PSNH forecasted the energy that would not be produced by its units because they were projected to be in economic reserve in 2013 and its projections were quite accurate when compared to actuals.

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they have extremely low capacity factors and the market price tends to closely reflect their cost when they do run[14]. Coal units have planned outages specifically modeled and are derated to their annual forced outage rate for the periods in which they run. PSNH's modeling reduces the unit forced outage rate if the unit is projected to be in reserve shut down, but continues to apply historical forced outage rates to remaining generation. PSNH also discretely models the short planned reliability outages for each unit. Newington costs were modeled as the projected market cost of gas or oil corrected for SO_X and NO_X calculations and at a full load dispatch rate. If the cost of Newington was lower than the blocks of power to be purchased, Newington was run as loaded for that block. The remainder of energy requirements was assumed to be supplied by the spot market.

In 2013, PSNH purchased 546 GWh of on-peak bilateral energy for $25.2 million and 232 GWh of off-peak bilateral energy for $10.0 million. In 2013, PSNH also spot-purchased 215 GWh of on-peak energy for $11.3 million, and 379 GWh of off-peak energy for $13.6 million. Total energy purchases totaled $60.0 million.

PSNH made spot sales into the ISO-NE spot market both from its own units and resale of unneeded purchased energy. PSNH sold 200 GWh of on-peak energy for $17.6 million and 256 GWh of off-peak energy for $19.3 million. The amount of purchased/self-generated energy PSNH resold into the market in 2013 totaled $36.9 million.

Some purchases are made in advance of expected energy needs. If actual loads are lower than expected, surplus energy may result in the system requiring its sale into the market. The market sold into very often is the spot market or other short term markets. Frequently, when there is surplus energy available, the short-term market prices are low because factors such as cool weather etc. affect all market participants at the same time. Sales into the short-term market often result in unavoidable losses on the transaction. Another reason why losses are unavoidable is that purchases are made with a constant MWh in each hour, requiring additional purchases and sales in the spot market to balance load requirements.

Total PSNH sales activity resulted in revenue of $36.9 million. Total PSNH energy purchases cost $60.0 million, resulting in a net cost of energy purchases of $23.1 million, which is significantly lower than the 2011 net cost of $91.4 million and the 2012 net cost of $71.8 million. Accion attributes the reduction in net purchased energy cost due to the relatively low and stable energy prices, resulting in better forecasting accuracy.

PSNH determined its 2013 projected unit capacity factors by explicitly modeling planned annual maintenance, and through consultation with plant personnel. Short-term planned reliability outages were also discretely modeled and are not included in the overall annualized forced outage factor between outages. The capacity factor tables at the end of this exhibit shows that PSNH base-load units performed near or better than forecasted, except where reserve shutdowns became a

[14] In actuality, ISO-NE may call for unit operation regardless of economics for system security and reliability which is not taken into account in the modeling process.

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factor due to the reduced price of energy in the ISO-NE market. PSNH modeled its units to project reserve shutdowns. PSNH personnel also stated that for 2013, load forecasts and supplemental purchase needs were evaluated during the times at which the December 2012 ES rate and June 2013 ES rate update was prepared and other times during the year.

Historic Capacity Supply

When the Forward Capacity Market ("FCM") transition period rules took effect in December 2006, each load serving entity was responsible for meeting its percentage of the total ISO-NE qualified capacity resources. ISO-NE qualified capacity resources were reduced by their individual forced outage rates. The seasonal capabilities of PSNH's units were also discounted for their forced outage rates to calculate PSNH'S percentage of the ISO-NE supply obligation. The FCM took effect in December 2006 and was in full effect from 2007 through May 2010 using set transition prices. Through May 2010, ISO-NE was in a surplus capacity situation. The FCM transition price of $4.10/kW-month was also the clearing price at that time. In June 2010, the FCM floor price was $4.50/kW-month which also became the clearing price. The post-June 2010 $4.50/kW-month clearing prices were adjusted downward so that only necessary capacity is supported. FCM clearing prices for June 2011 through May 2012 were $3.60/kW-month, and $2.95 per kW-month for the remainder of the year.

2013 PSNH Capacity Supply

Under the FCM rules, PSNH was billed at the capacity rate of $2.95 per kW-month through May 2013, and again at $2.95 per KW-month from June through December 2013 (two separate FCM auctions), for its 3.32% to 3.09% monthly share of the 31,254 MW to 31,594 MW of ISO-NE installed capacity requirements. This figure equates to 1,041 MW to 1,234 MW per month, less the value of its own resources. The FCM price level for 2013 was adjusted in June of 2013. FCM prices were also adjusted so that only ISO-NE required capacity was supported on a pro-rata basis. The ISO-NE capacity rates as adjusted became the clearing prices and produced a bill for $37.6 million for capacity payment obligations. PSNH unit capacity produced a $39.0 million credit, leaving PSNH with a net $1.5 million capacity revenue for 2013, a reduction of $11.5 million from 2012 capacity costs, and a $13.7 million reduction from 2010 capacity costs.

PSNH Generation Units' Interrelationship with the 2013 Energy Market

Where much of PSNH's generating units have historically been considered either base-load generation (and generally lower priced than the market) or peaking generation (and more expensively priced than the market), it was not expected that their operation would be significantly influenced by market prices. This relationship began changing in 2010 and continued into 2013 and can be seen in the table depicting actual unit capacity factors. Prices in the ISO-NE market remained at low price levels in the non-peak months. PSNH base-load units at Merrimack and Schiller Stations, except for Schiller-5 were at many times placed into economic reserve status. In addition, the poor economics of shutting a base-load unit down (due to start-up costs) all contributed to the placement of units into economic reserve status.

The price of energy purchased from the ISO-NE market remained low during 2013. The low energy prices in 2013 resulted in PSNH's previously base-load coal units (Merrimack-1, Merrimack-2, Schiller-4, and Schiller-6) being placed on economic reserve for many more hours than in previous years, but in line with PSNH forecasts. PSNH changed operations and maintenance practices at its coal units much like it previously did for Newington to maximize operations and minimize costs in a changing marketplace.

In 2013, energy service loads generally were as forecasted by PSNH. PSNH continued to rely on the market for a significant but smaller portion of its energy requirements including during times of system planned maintenance outages. Approximately 45 to 58 percent of the monthly energy requirements of all classes of customers were met from the market or self-supply, resulting in reduced supplemental purchase requirements. With low market energy prices during much of 2013, PSNH continued to be very susceptible to both low market price in relation to the cost of its formerly base-load units, and to fluctuations in the supplemental purchase requirements, resulting from changing economic conditions and to a lesser degree from customers migrating to and from competitive supply options.

Accion believes that PSNH adequately anticipated the market paradigm changes and adjusted its procurement policies appropriately.

Financial Transmission Rights

PSNH uses Financial Transmission Rights ("FTRs") in all hours where it expects its units to run to protect against congestion pricing in the market. In essence, FTRs trade a potentially high and variable congestion price for a known price. FTRs are limited by actual system capability, function much like a hedge, and bring certainty to the price of generation with regard to congestion. FTRs are purchased as needed between the major PSNH generation sources (Merrimack, Newington, Schiller, and the Mass. Hub and collectively known as the source locations) for the months they are expected to run or in which purchases are made from the market and the New Hampshire load zone (referred to as the sink location). In 2013, PSNH made FTR purchases such that a total of 1,267 MW-months of on-peak and 570 MW months of off-peak FTRs were purchased. PSNH factored in known outages and expected load into its decision process. No FTR purchases were made for Newington in 2013. The table below shows PSNH's historical and 2013 FTR purchases, their value regarding avoided congestion costs, and their cost to PSNH customers.

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PSNH Historical and 2013 FTR Costs and Savings [1]

Year	Auction Cost (Thousands)	Avoided Congestion Costs (Thousands)	Net Cost (Benefit) (Thousands)
2009	10	122	(112)
2010	31	400	(369)
2011	16	(7)	23
2012	27	81	(53)
2013	(29)	519	490

1 – May not add due to rounding.

In 2013, unusual congestion occurred at the MA-Hub in September and December causing much of the FTR costs for the year.

Historical and Actual Unit Performance

The historical performance of PSNH units is considered when determining when to procure supply from supplemental sources. Heat rates are also a useful tool in tracking how efficiently a unit converts fuel to electrical energy. The table below depicts the historical average heat rates and average heat rates for 2013 for PSNH's major units and the units' current full load heat rates.

PSNH Major Unit Historical, 2013, and Full Load Unit Heat Rates

Unit	Average Annual Heat Rate (BTU/kWh)					Full Load Heat Rate (BTU/kWh)
	2009	**2010**	**2011**	**2012**	**2013**	**2013**
Merrimack-1	10,211	10,221	10,435	10,682	10,665	9,900
Merrimack-2	9,919	9,663	9,826	9,853	10,207	9,520
Newington	12,382	13,517	13,429	13,069	13,791	10,900
Schiller-4	13,019	13,073	14,545	13,489	12,482	12,900
Schiller-5	17,122	17,131	15,401	15,552	15,775	15,400
Schiller-6	12,644	12,588	14,195	13,375	11,714	12,300

The above table shows reasonable stability in the efficiency of Newington and the coal units at Merrimack, and improvements in the efficiency of the Schiller coal units with the Schiller wood unit remaining relatively constant. Such changes are expected given the base load nature of the Schiller wood unit and the increased market prices experienced in 2013. The ISO-NE more frequently starts, stops, or runs the PSNH four coal units at reduced load. This mode of operation negatively impacts unit efficiency. The actual heat rates are consistent with a reduced mode of operation as dictated by the market and clearly show that PSNH is adapting its market knowledge into the paradigm of its unit operations for Unit #4 and #6 at Schiller Station.

Historic and 2013 Unit Capacity Factors

The table below shows the historical capacity factors and the projected capacity factors used for the 2012/2013 period.[15]

Historic Actual, 2013, and Projected Annual Capacity Factors for PSNH Major Units in Percent (Annual Generation/Winter Rating/8760)

Unit	Actual Capacity Factor [2]					Projected Capacity Factor (CF)
	2009	**2010**	**2011**	**2012**	**2013**	**2013**
Merrimack-1	84.1 [1]	67.2	57.9	36.6	38.1	32.0
Merrimack-2	56.1	67.5	47.9	28.8	33.1	29.2
Schiller-4	59.5	53.4	28.8	11.3	23.1	9.2
Schiller-5	79.6	79.0	78.3	90.3	88.1	82.5
Schiller-6	56.9	51.0	25.3	11.2	19.5	9.2
Newington	5.2	6.4	3.6	2.1	2.3	2.1

1 - No unit overhaul in this year.
2 – Actuals reflect reserve shut down periods.

In the following table, Accion presents the impact of economic reserve shutdowns on normal capacity factors for the major units.

Reduction of Unit Capacity Factor Due to Economic Reserve Shutdowns (Percent)

Unit	Actual Reduction in Capacity Factor				Projected Reduction in Capacity Factor
	2010	**2011**	**2012**	**2013**	**2013**
Merrimack-1	9.4	10.9	46.8	46.2	53.9
Merrimack-2	9.6	26.6	41.8	31.8	43.4
Schiller-4	10.8	46.2	66.2	65.6	88.1
Schiller-5	0.1	0.0	0.0	0.0	0.0
Schiller-6	20.2	53.4	72.2	63.4	74.4
Newington	78.4	85.3	89.7	90.0	94.7

If the values of the two tables above are added together on a unit basis, one can see that historic high capacity factors would still be obtained assuming that additional forced outages did not take place if the units were not in economic reserve. Accion concludes that base load units by design were efficiently run in 2013.

[15] Calendar 2013 is in this period.

Historical and 2013 Availabilities

Another important measure of the operation of a unit is the availability[16] of that unit to serve load. For base-load units, the availability is a good proxy to answer the question "Was the unit generating energy economies for customers?" because expected run time is any time the unit is available to run. For non-base-load units, the availability figure degrades in usefulness as the capacity factor of the unit decreases. For example, a combustion turbine may have an availability of 100 percent, but may never operate for appreciable times during the year. Accion Group believes that a more useful measurement of unit and management performance in a market environment is to look at the highest market priced days during the year.[17] The table below depicts unit and fleet historical availabilities during the 30 highest cost market days during the year as traditionally defined.

PSNH Major Unit 2013 and Historical Availability on the 30 Highest Priced Energy Days

Unit	30-Day Availability (Percent)				
	2009	2010	2011	2012	2013
MK-1	98.4	99.2	99.3	99.6	99.7
MK-2	100.0	90.7	89.8	99.5	98.4
NEW-1	99.0	95.2	96.2	99.6	99.6
SCH-4	92.6	97.4	99.1	96.6	97.8
SCH-5	83.8	80.5	96.2	96.3	99.0
SCH-6	100.0	98.6	99.9	100.0	96.0
FLEET	**97.4**	**93.8**	**94.6**	**98.2**	**98.3**

The table above demonstrates that PSNH's units had high availability on the highest cost days to reduce costs to customers if they were economic to run.

Load Migration

With regard to migration, Accion Group concluded that it was not difficult to do realistic forward looking market purchases when approximately 45 to 58% of the monthly energy to be served can come and go at will because of the low market prices that existed throughout much of the year in 2013. Remaining PSNH energy service customers see higher costs when other PSNH customers migrate away from the system as the departing customers seek lower power costs. Any excess energy resulting from the outward migration is generally of little value when resold because the market price is low enough to have caused the migration.

[16] Normally, availability figures do not show if a unit was at reduced capability while it was available. The industry uses the availability^{-1} metric for that purpose which is the percentage of time the unit would be available at full load.

[17] PSNH included an availability metric which it stated as the "service factor" and defined as the percentage of time the unit was running to serve load at any output level.

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Likewise, customers remaining on the system also see higher costs when migration into the system occurs. This customer migration occurs when migrating customers seek lower power costs. Any shortage of energy resulting from the inward migration is generally worth more when purchased because the market price is higher, and thus caused the migration back to PSNH. In addition, PSNH's lower cost generation at that time is diluted over a larger MWH load. Because customers have such a flexible menu of choices regarding energy supply, customer migration can vary widely in both directions within the calendar year, making the forecast of supplemental energy needs difficult for PSNH depending on ISO-NE market prices. In 2013, energy prices were relatively stable and low throughout much of the year, resulting in relatively stable customer migration in the amount of approximately 52% of total customer annual energy.

Evaluation

Accion Group reviewed the capacity/energy planning testimony filed by PSNH, conducted an on-site interview with knowledgeable personnel responsible for the capacity/energy planning function at PSNH, monitored bi-weekly supply meetings, submitted follow-up data requests, and reviewed detailed backup information of the summary results supplied by PSNH.

Accion Group concluded that the PSNH filing is an accurate representation of the process that took place in 2013. Accion Group believes that PSNH made sound management decisions with regard to capacity and energy purchases and sales in its market environment, and that PSNH's actions were consistent with its Least Cost Integrated Resource Plan (LCIRP) as modified on March 28, 2008 through January 29, 2013, and its LCIRP requirements (2010 LCIRP as approved on January 29, 2013) for the remainder of the year. Accion Group also concluded that the capacity factor projections used by PSNH in its purchase projections and the hours of economic reserve shut down of its units projected in its ES filings were reasonable at the time they were made.

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Exhibit MDC-3 Merrimack Outages for 2013

Merrimack Outages For 2013

This exhibit covers the review of the specific outages that occurred at both Merrimack Unit 1 and Merrimack Unit 2 during 2013 including both forced and planned outages.

The major project at Merrimack Station for 2013 was the continued transition of station maintenance and operations from prior base load operations to a more cyclical market environment as well as preparation for high reliability during the high demand periods. An unplanned major project emerged during the annual maintenance for Unit 2 when PSNH found upon inspection that the generator windings required replacement.

Attention to safety and environmental compliance is one indicator of good operational performance. PSNH stated that Merrimack Station had no lost time accidents or no air permit and water permit violations in 2013.

Merrimack-1

The following outages occurred at Unit 1 during 2013. Since the 2010 overhaul, system economics have placed the unit higher on the dispatch curve, requiring fewer hours of operation and more hours in economic reserve. Major maintenance overhauls have been reduced because, when the unit is not operating due to economics, the unit can be taken out of service for repairs without incurring replacement power costs.

A – (Outage Report OR-2013-01)
1/8 – 2.9 days
During a time when energy prices were low, the unit was taken off-line in anticipation of a required shutdown at a later date to perform an air heater wash. The air heater wash was necessary due to a rising pressure drop across the air heater. While the air heater wash was performed, a tube leak was repaired. When the unit returned to service, it was placed in economic reserve status.

B
4/16 – 1.5 days
While the unit was in reserve status, PSNH, declared a unit outage. PSNH desired to inspect the 1B Forced Draft fan as axial thrusting (movement back and forth) of the fan shaft had been observed indicating a potential problem with the fan's thrust bearing assembly. PSNH coordinated this outage with its transmission department because the upcoming transmission outage (reconstruction of the H-137 Merrimack to Garvins 115kV line) would affect plant operations. Upon inspection, excessive wear was noted in the shaft groove where the thrust collar rides, allowing movement of this thrust collar and, therefore, the fan

shaft. PSNH performed a temporary repair to the axial collar and returned the unit to service. PSNH then formulated a plan for permanent repairs.

C - (Outage Report OR-2013-05)
5/6 – 11.3 days
PSNH removed the unit from service to perform final repairs to the 1B Forced Draft fan (Outage B above). PSNH anticipated low energy market prices, and the outage could be performed without PSNH incurring replacement power costs. The entire fan wheel was sent out to have the shaft re-machined in the thrust collar fit area, and a new coupling was installed. The fan was aligned, balanced, and the unit returned to service in reserve status.

D
6/24 – 0.0 days
This outage was actually a late phase of the unit when start up time requirements could not be met. The ISO-NE called for Merrimack Unit 1, Unit 2, and both combustion turbines to start late Sunday evening and all at the same time. Accion notes that this is not a common occurrence, especially late on a Sunday evening. Both Merrimack Unit 1 and 2 had a 12-hour start time. During startup of both units, Unit 2 experienced a problem with a gas recirculation fan. The fan recirculates flue gas back through boiler for temperature control in the boiler. PSNH focused its resources on the Unit 2 fan issues first, and as a result of that focus, Unit 1 was 0.5 hours late phasing to the system. Unit 2 was 2.0 hours late. Please also see Outage 2-C which is the Unit 2 outage related to this event.

E
8/5 – 0.2 days
During start up, the Unit 1 Induced Draft (ID) booster fan has typically been started when the boiler furnace pressure is approximately 11 inches of water. When the booster fan went into operation for this start up, its inlet vanes were set at 0% (closed), and the boiler furnace pressure was at 11 inches of water. The boiler pressure began to drop and tripped at 5 inches of water, its required set trip point. The unit was then started without incident.

PSNH had used 11 inches of water pressure in the boiler during startup for the first year or so without incident. The swapping of cyclones during startup, leakage at various damper locations, and the status of Unit 2 can all impact the pressure drop in the boiler when the ID booster fan is started. After further consideration of these issues PSNH tightened the damper vanes to get better closure of the damper to reduce leakage, and raised the booster ID fan start set point to 15 inches of water.

F
8/5 – 0.2 days
During startup of the unit, and while increasing load on the unit, coal flow was lost due to a "loss of coal" indication on one of the three coal feeders. The unit operator did not receive a "no coal feeder" alarm. Consequently, the unit tripped on activation of the "no load steam

flow" protection. No load steam flow protection monitors the steam pressure across the turbine, to ensure that adequate steam is entering the turbine to produce the actual electrical output occurring.

The no coal feeder alarm is triggered by paddles that float across the coal running in the feeders. If there is no coal in the feeder, the paddle will drop and trigger the alarm. PSNH tried to duplicate the event, but could not do so. PSNH believes that the paddle became hung up because of its environment and, therefore, did not trigger the "no coal" alarm and that subsequent to the event, whatever crust had caused the malfunction had dropped off the paddle allowing it to function properly. No coal on one feeder then caused steam flow across the turbine versus electrical output trip.

G
8/15 – 0.9 days
The unit was in economic reserve. PSNH did a boiler inspection. The inspection found a tube leak in the wall of the boiler. The leak was repaired and the unit returned to service in economic reserve.

H
9/11 – 0.1 days
This outage occurred due to a late phase of the unit in cold start conditions due to differential (top versus bottom) expansion of the turbine casing. Even heating and expansion of turbine components is required to prevent rubs or contact between rotating and stationary turbine parts that expand and/or contract at different rates. PSNH had to let the unit gradually warm up dissimilar metal parts to remedy the problem. PSNH previously had similar problems due to this condition.

In prior years, Merrimack 1 was operated as a base load unit, and bidding mechanisms were less restrictive regarding start times. More recently, the unit often operates in economic reserve, and is selected and committed in the ISO-NE's day-ahead market. In the day ahead market, PSNH must make its committed startup times and faces economic consequences if it does meet those time requirements.

Accion notes that a similar problem occurred at Unit 2 and that a heating blanket was installed on that unit to mitigate cold start-up issues with success. PSNH plans to install a similar blanket on Unit 1 during the 2015 maintenance overhaul.

I
10/28 – 25.1 days
A full scale maintenance outage was not performed on this unit in 2013 because of reduced operation time. During a time when energy prices were low, PSNH elected to perform an extensive planned reliability outage to ensure the unit's availability and integrity, while also reducing costs. To that end, PSNH used in-house people to the extent possible, conducted

the outage on a straight time basis where possible, and drew on other PSNH resources as available.

The ISO-NE outage window was 35.3 days and the outage was estimated to be 24.2 days in length. The actual outage time as noted above was 25.1 days and occurred during the extensive Merrimack 2 annual maintenance outage. PSNH prioritized the projects to be conducted the outage, similar to its conduct of a planned maintenance overhaul.

The critical path for the outage was the overhaul of the units' cyclone burners. On day 4 of the outage, inspection found that the cyclones would not require as much repair as expected, resulting in an 18 hour gain in schedule. The outage continued smoothly until day 18. At that time, PSNH evaluated the future market prices and concluded that the unit would not be needed for the foreseeable future. PSNH eliminated all overtime related to the critical path, resulting in a 47 hour loss in the original outage schedule. PSNH also shifted the critical path to the boiler steam drum work, followed very closely by the repair work to the secondary superheater inlet/outlet tubes in the boiler. With minimal gains in schedule, the critical path switched to the secondary super heater inlet/outlet tubes, which remained on critical path for the duration of the outage.

The Unit returned to service without incident.

Merrimack-2

The following outages occurred at Merrimack Unit 2 during 2013. Since the 2011 overhaul, system economics have placed Unit 2 higher on the dispatch curve requiring fewer hours of operation, and more hours in economic reserve. PSNH performs as much maintenance as possible when the unit is in economic reserve, and takes outages when replacement power costs will not be incurred.

A - (Outage Report OR-2013-02)
3/21 – 3.2 days
The unit was removed from service due to increasing water usage and low expected future market prices. Excessive water usage indicates that there are multiple or very severe tube leaks in the boiler. PSNH found three barrel tube leaks in cyclone 2F and one leak each in cyclones 2C, 2E, and 2G. All leaks were pad-welded and hydro-tested. When the repairs were complete, the unit returned to service in reserve status.

B - (Outage Report OR-2013-03)
4/21 – 19.0 days
This outage was taken while the unit was in and expected to remain in economic reserve status. PSNH had a previous issue with the #1 high pressure feedwater heater, with internal leakage from the water side to the steam side of the shell. As a temporary fix, the heater was by-passed, so operations could continue and preparations could be made for a

permanent repair. The unit was taken out of service in this outage to perform those planned repairs.

During this outage, the #1 heater outlet valve was replaced and repairs were made to the heater itself. PSNH flooded the heater to determine which tubes were leaking and then plugged the leaks. PSNH also did eddy current testing of the non-leaking tubes. The tubes identified with the potential to leak were also plugged. When repairs were complete, the unit returned to service in reserve status.

C
6/24 – 0.2 days
This outage was actually a late start of the unit when requested to start by ISO-NE. Unit 2 requires both gas recirculation fans to be operable during startup. The 2A gas recirculation fan had a high temperature on the outboard bearing. The bearing was flushed and the unit was started without incident, but did not meet the required startup time.
PSNH added two hours to both units' startup requirements to reduce potential for future late phase issues, and to better reflect current operating conditions. Please also see companion outage of Unit 1 in Outage 1-D above.

Accion notes that the 2A gas recirculation fan was replaced in the annual overhaul in Outage 2F, below. In addition, PSNH states that the 2B gas recirculation fan will be replaced in a future outage.

D – (Outage Report 2013-06)
7/25 – 3.8 days
The unit was in reserve status. Prior to the unit coming off line, an operator performing his rounds noticed a minor leak in a non-metallic expansion joint. Repairs were made to two expansion joints and to 4 cyclone tube leaks. Repairs were made and the unit was returned to reserve status.

E
9/11 – 0.2 days
The unit was in reserve shutdown and was requested to operate by the ISO-NE. The unit missed its ISO-NE required startup time. PSNH investigation found that the drawer for relay PT-20 was closed but not fully seated. The fact that this drawer was not fully closed, and required electrical connections were not made, prevented the comparison of the generator bus and system voltages which prevented the unit from phasing. There are no alarms indicating that the draws are not fully closed. PSNH reset the drawer, confirmed proper operation, reset affected relays, and returned the unit to service.

PSNH also reviewed the need to ensure that these drawers are completely seated when closed with all operating personnel.

F

9/16 – 82.4 days

A full-scale maintenance outage was not performed on this unit in 2012 because of reduced operation time. A planned full maintenance outage was performed in 2013.

The original ISO-NE outage window was 39.3 days and the outage was estimated to be 27.9 days in length. PSNH conducted the outage similar to the manner in which it conducts a pre-planned maintenance overhaul by prioritizing projects to be accomplished during the outage. PSNH conducted outage meetings to maintain workforce coordination, and worked off its backlog list. Many activities that are time-of-operation dependent were done on a "inspect and repair as necessary" basis, rather than on a mandatory rework basis. In addition to the planned generator inspection, the major efforts in the outage related to inspection of the boiler, refractory repairs, and cyclone repairs, all aimed making the unit available for the upcoming winter season.

Early on in the outage (Approximately 9/29), the thorough inspection of the generator revealed damage to generator stator coils.

During the 2007 generator inspection Siemens noted areas of vibrations occurring in the coils, and recommended to PSNH that they purchase material for a complete generator stator rewind so that they would be available, as a contingency, for the 2008 full inspection of the generator. PSNH agreed because it did not want to wait a significant amount of time for parts delivery if winding replacement was found as an emergent condition during the 2008 full generator inspection.

In the 2008 full inspection of the generator, minor repairs were found to be necessary, but replacement of the coils was not required. PSNH retained the coil materials for future use under climatic controlled conditions. Siemens recommended that the inspection of the generator schedule be reduced from 5-years to 3-years. PSNH agreed.

In 2011 a generator crawl-through inspection was performed. Although some winding looseness was found, the findings did not require a rewind of the generator at that time.

Replacement of the generator stator windings in the 2013 outage was discussed in preparation for the outage, but based on the testing and findings through late 2012, a solid business case for replacement could not be made. PSNH and Siemens agreed to perform a replacement strategy based on the results of the 2013 full generator inspection.

The full 2013 generator inspection revealed that there was damage to one generator stator coil and relatively more damage than was observed in the past. PSNH had 3 options for this problem. Two options were to replace or repair one coil. If one coil was replaced or repaired, it generally disturbed the adjacent and/or remaining coils in that section, requiring those coils to be replaced and Siemens would not warranty the work. The remaining option was to replace all the generator coils. Siemens would warranty the work on total coil replacement. PSNH decided to replace all the coils because PSNH had the coils in inventory. The replacement of the coils incorporated lessons learned since 2008 with regard to coil replacements at other facilities.

With the decision to replace all the generator coils, the outage schedule required modification. (Accion notes here that during this outage, 52 schedule revisions were required)

On day 2 of the outage a 55-hour loss occurred in the schedule. PSNH found that two work items conflicted with each other because they could not 100% be done in parallel. This incompatibility resulted in a 55-hour loss of outage schedule. The majority of the loss was attributed to the fact that a module that was completed early in Saturday was pushed to Monday due to the fact that overtime was not scheduled at this time.

An additional 103-hour schedule loss occurred when inspection of the cyclones required significant additional work, changing the outage critical path work to the cyclones. On day 16 of the outage, however, the addition of the generator rewind activities to the schedule made that work become the critical path.

PSNH required that the generator coils be tested and certified ready for service. The final result of those tests allowed the schedule to gain 64 hours on day 17 of the outage due to improved delivery dates. The rewind remained on critical path.

The outage advanced to day 25 where hot spots tested in the generator stator rotor iron required further testing, resulting in a further 41-hour schedule delay. Further coil inspections resulted in additional delays in schedule because additional iron and mica insertion was found to be necessary. Other delays were incurred due to lead abatement delays and additional generator winding assessments.

The outage continued relatively smoothly until day 71, where a 32-hour gain in schedule occurred due to quicker generator assembly. In the final stages of the outage, the hi-pot test (high potential test) of the generator bushings indicated that the bushings had to be disassembled and cleaned more thoroughly, resulting in a 24-hour delay.

G
12/7 – 0.1 days
The unit was returning to service from the planned maintenance outage (Outage 2-F directly above) when then unit tripped because of action of the no-load steam flow switch. This protection circuit monitors the steam pressure across the high pressure turbine to ensure that the turbine steam flow is adequate for the indicated generator output.

PSNH investigation found that a small manual isolation valve in one of the sensing lines used to measure the pressure differential was left closed during the calibration process during the prior outage. The closed valve indicated no steam flow across the turbine resulting in the trip.

PSNH modified its procedures to include a post-calibration walk-down of the system to verify valving to prevent a reoccurrence of this event.

H – (Outage Report OR-2013-09)
12/29 – 2.7 days
The unit was removed from service due to a catastrophic tube leak failure in the superheater reheat section of the boiler. A horizontal reheater tube failure occurred due to tube thinning by flyash erosion. PSNH inspection revealed that an additional tube was damaged by the failure of the first tube. Both required Dutchman[18] tube repairs.
In addition, the inspection of the boiler found 2 barrel tube leaks in cyclones 2A, 2B, 2C, 2F, and 1 leak in cyclone 2G. All leaks were repaired with pad welding. Work was conducted on a 24/7 basis. Hydro inspections were made, no other repairs were identified, and the unit was placed on-line.

Evaluation for Merrimack

Accion Group reviewed the outages above and found them either to be reasonable and not unexpected for these units and their vintage, or necessary for proper operation of the unit. Accion Group concluded that PSNH conducted proper management oversight during these outages.

In addition, Accion performed a station walk-through on 1/14/14. Accion found the station to be reasonably tidy and clean. Accion saw that various motors, pumps had been repaired or replaced giving support that required maintenance is being performed. Accion also noted that all fire equipment inspections were current.

[18] A Dutchman boiler tube repair is one where a section of the boiler tube is cut out and replaced with a new section of boiler tube.

Exhibit MDC-4 Newington Outages for 2013

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Newington Outages For 2013

Newington-1

No major capital projects occurred in 2013.

Attention to safety and environmental compliance is one indicator of good operational performance. Newington achieved a safety record of no lost time accidents (LTAs) for the last 12 years in 2013. Newington has had only one LTA in the last 24 years. Newington reported no air or water permit violations for 2013 and stated that it is looking at options regarding future changes in those environmental permit requirements to ensure compliance.

The capacity factor[19] for Newington in 2013 was 2.3%.

Unit availability for 2013 was 96.6%[20]. The unit service factor was 7.5% (Hours on line/Total hours). The service factor when compared to the capacity factor is an indicator that includes times where the unit was on line providing services to the system (other than economics) at a reduced load (Such as spinning reserve or area reliability protection). In addition the Newington service factor increased by 50.0% in 2013. The increase in the service factor is believed to be a result of the flexibility of operational capabilities at Newington when integrated with ISO-NE operating requirements.

Accion notes that gas usage at Newington was 4 times that of oil in 2012 on a BTU basis and that oil usage was 2 times that of gas in 2013 on a BTU basis which signals a shift towards oil usage at the plant due to economic factors.

Newington participated in the ISO-NE 2013/2014 Winter Reliability Program. In that program, Newington offered 4 levels of oil storage at specified tier costs. The ISO-NE accepted 3 of those level offerings resulting in a backup oil supply of 340,000 barrels or 140,000 barrels above the then-current PSNH inventory levels.

The following outages took place at Newington during 2013:

A
1/23 – 0.2 days
The unit tripped because of the activation of the 326 line (Scobie Pond to Sandy Pond) Special Protective Scheme ("SPS"). The 326 SPS requires the trip of the Newington unit if the transfers from Northern New England to Southern New England (or other corridor transfer limits) exceed specified values when the unit is operating.

[19] The unit generated energy for the year equal to full nameplate power production for 2.3% of the hours during the year.
[20] The unit was available to generate power for 96.6% of the hours in the year.

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PSNH's investigation found that the 326 SPS operated improperly because of high noise levels on the protective scheme communications (telephone) channels.

When ISO-NE allowed the SPS to be disarmed, the unit returned to service.

Noise levels have since been addressed on the protective communications channels.

Please also see the response to Staff Data Request 2-15.

B
4/1 – 11.4 days
This planned outage was scheduled for annual maintenance and inspection of the unit. The ISO-NE outage window was 14 days and the outage was planned to be 14 days in length. The major project and critical path for this outage was the replacement of two of the three 2.4kV/480V load center transformers (1LA and 1LB). Replacement of the transformers was necessary due to the age and condition of the equipment and changes in OSHA flashover requirements. Accion notes the 1LC bank was replaced in 2012 in anticipation and facilitation of the current project so that critical load could be shifted to the operating transformer(s).

Other projects conducted during the outage included the replacement of the 40-year old boiler feed pump valve V3-1 due to corrosion. Similar valves at Newington have been inspected and boroscoped without corrosion being evident. PSNH believes that these other valves are operating at lower pressure and that mitigates the probability of the corrosion event. PSNH is monitoring those valves for potential replacement in the future. Another outage project was replacement of the main condenser manifold which was identified in the 2008 maintenance overhaul. In that 2008 inspection, it was recommended that the manifold should be replaced in 5 to 6 years.

The outage was performed mostly on straight time, with PSNH personnel available, and at a time when the plant would not have operated resulting in zero replacement power costs.

C
7/15 – 0.1 days
The unit tripped on low water level because the steam driven boiler feed pump could not supply sufficient water to the boiler.

PSNH's investigation found a restricted air supply into the control valve that puts steam into the feed pump valve. (The steam pump replaces the electric pump at an 80 MW feedwater level).

PSNH's investigation found that the steam restriction was due to a partially closed manually operated petcock valve. PSNH believes that the petcock valve was apparently bumped during normal operations of the plant, partially closing the valve. PSNH has reviewed similar valves throughout the plant and tie-wrapped them to prevent similar reoccurrences from occurring.

Evaluation for Newington Except for Outage C

Accion Group reviewed these outages and found them either to be reasonable and not unexpected for this unit and its vintage, or necessary for proper operation of the unit. Accion Group concluded that PSNH conducted proper management oversight during these outages.

In addition, Accion performed a station walk down on 12/11/14. Accion found the station to be reasonably tidy and clean. Accion saw that various motors and pumps had been repaired or replaced giving support that required maintenance is being performed. Accion also noted that all fire equipment inspections were current.

Evaluation for Newington Outage C

Accion has reviewed the location of this valve and does not find that it is in the path of personnel moving throughout the area. In addition, the air valve handle is protected from such accidental movement by the physical placement of the valve itself and other adjacent equipment. Further, Accion finds that accidental partial activation of this valve could not reasonably take place by entanglement of tool belts without the operator being aware of such movement or restriction. Accion finds the partial movement of this valve due to operator inattentiveness. Accion recommends disallowance of replacement power costs related to this event.

Recommendation

If PSNH has not already done so, Accion recommends that this inadvertent valve operation and preventative solutions be shared with other PSNH plants.

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Exhibit MDC-5 Schiller Outages for 2013

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Schiller Unit Outages For 2013

The planned maintenance overhaul of Unit #5 included the replacement of boiler equipment and general boiler repairs.

No planned maintenance overhaul was performed on Unit #4 in 2013 due to its reduced operating time.

The Schiller #6 maintenance overhaul's major project consisted of replacing the unit control system with a digital control system similar to that done for Unit #4 in 2011.

Attention to safety and environmental compliance is one indicator of good operational performance. Schiller continues to focus on improving its safety record. To that end, Schiller achieved no lost time accidents in 2013. In addition, Schiller states that no water or air permit violations occurred in 2013.

In addition, Schiller Unit #5 experienced 2 of its top 10 runs during 2013. (86 and 103 consecutive days).

Schiller-4

The following outages occurred at Schiller-4 during 2013.

A
1/6 – 3.2 days
The unit was running per ISO-NE request until January 4th when the unit was requested to be taken off line and placed into reserve status. The unit was shut down. The unit was called to run by the ISO-NE at this time but PSNH found a leak in the boiler main steam stop valve during startup. PSNH took the unit off line as it expected a short run time due to warming temperatures in the upcoming run time frame. The valve vendor machined the valve surfaces and replaced the valve internals and the unit returned to service.

B
1/18 – 0.0 days
ISO-NE requested that the unit be placed on line at full load. As soon as the unit was on line, the ISO-NE dispatched the unit to emergency low load known as Emergency Minimum. At Emergency Minimum load (1 coal mill), the burner management system uses 1 out of 3 scanners, instead of 2 out of 3 scanners to detect loss of flame for a boiler trip. During the time at this operating condition, one scanner went out and tripped the unit. The scanner that initiated the unit trip was cleaned and the unit was returned to service.

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C

2/20 – 2.0 days

The unit was taken off line by PSNH because of excessive water usage due to tube leaks. PSNH found 2 tube leaks, made appropriate repairs, performed hydro tests and returned the unit to service.

D

3/18 – 0.0 days

The unit was called to run by the ISO-NE. The Control Room Operator (CO) was training an Equipment Operator-A (EOA), which is a backup operator for the CO. (A normal Equipment Operator (EO) cannot perform this function). The unit was being switched from oil to coal on the first coal mill. When the unit changes from oil to coal firing, oil guns are removed and the air needs to be adjusted downward. As coal firing is stabilized, the EOA radios the EO at the boiler front to remove oil guns. As the guns are removed, air input is adjusted accordingly. The EOA instructed the EO to remove the oil guns too soon not allowing the control system to make the required air adjustments. Before the CO could override the command to the EO from the control room, the unit tripped on high furnace pressure. The boiler stabilized and the oil fires were reestablished and the unit was put on line.

E – (Outage Report OR-2013-4)

5/5 – 10.0 days

The unit was taken out of service to perform planned maintenance including the replacement of the hydrogen coolers. The decision was made to perform the work at this time because low energy prices were forecasted, the required Siemens workers were on site, and the low price energy window was long enough that repairs could be done on a straight time basis. The hydrogen cooler work was completed and passed both the required air and hydrostatic tests. Other maintenance items were performed as well.

While filling the unit with hydrogen, the hydrogen seal oil tank was not maintaining its proper level for sealing. The oil level is maintained by a vertical float mechanism. Disassembly of the seal oil tank found that the float mechanism was bent. PSNH inspection suggested that the float mechanism was bent prior to the current work and had hung up during this event as this equipment was not worked on during the current outage. Replacement parts were ordered. While waiting for delivery of the parts, PSNH was able to fix the float system and returned the unit to service. When the ordered parts were received, they were placed in stock as replacement parts for all three units.

F

5/31 – 0.0 days

The unit was being placed on line at the request of the ISO-NE. The CO adjusted the overfire air dampers to 99% in the manual mode. The CO placed the overfire air dampers in the automatic mode when dampers started to close, cutting off combustion air for the boiler.

The boiler went into a pressure swing and tripped out on low boiler pressure. PSNH stated that, prior to placing the overfire air dampers in the automatic mode, the CO should have made the automatic set point 99% open, and this action was missed by the CO. Without this action, the set point reverted back to its last position of 52% causing the boiler pressure swing.

Schiller-5

The following outages occurred at Schiller-5 during 2013.

A
1/1 – 0.8 days
Most of this outage duration occurred in 2013. As per established convention, prudence review occurs in the year where the majority of outage hours occur. Total outage time was 1.0 days

On 12/31/12, the unit tripped due to pluggage in the wood feed system after a 155 day run. The boiler went into a pressure swing due to lack of fuel input. In the meantime, the pluggage was cleared and the wood feeders were restarted; however the bed temperature level could not be raised to meet the requirements for the injection of solid fuel. PSNH tried to ignite the gas burner, but the gas burner kept tripping out due to low gas pressure. The unit was eventually manually tripped. Upon investigation, Northern Utilities found that the incoming gas pressure was 12 psi instead of the required 35 psi. PSNH requested that Northern Utilities raise the incoming gas pressure to 40 psi. Northern Utilities found that they had an issue on the pressure regulator on the PSNH feed, repaired the regulator, and verified adequate incoming gas pressure with a burner light test.

B
4/13 – 19.9 days
This outage was the annual planned maintenance overhaul for the unit. The timing of the outage coincides with the so-called “mud season” in the logging industry where tree harvesting is all but prohibited, as a means to minimize wood inventory levels. The critical path of the outage was the repair of the cyclones. The ISO-NE outage window was approximately 22.9 days beginning on April 15, 2013, the PSNH planned outage time was 22.7 days, and the actual outage time was 19.9 days.

As stated above, the critical path of the outage was the repair of the cyclones. In addition, the remaining one-half of the air heater tubes (1452) were to be replaced during this outage. On April 19th, a 56 hour gain was made in critical path due to a revision of the cyclone work requirements based on as found conditions. On April 30th, a 2 hour delay in schedule was encountered due to the fact that the sandblasting contractor could not completely accommodate the 56 hour gain in schedule that was made on April 19th. An 8-hour loss in schedule occurred on May 3rd to repair of cracks that were discovered on the air

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heater cold side air duct during startup. The cold side air ducts were not worked on during the outage and the cracks were found during startup when an operator making rounds heard noises in the area.

C
5/3 – 0.3 days
A fuel pluggage occurred that caused boiler swings resulting in one cyclone exceeding 1800°F. Control logic requires a boiler trip if one cyclone remains at or above 1800°F for 5 minutes. When one of the 4 wood feeder chutes plugs, imbalances between air and fuel occur in sections of the furnace. Two risers carry the gasses out of the furnace area (each tied to 3 cyclones). When an imbalance occurs, more CO_2 (Carbon Dioxide) and unburnt fuel is passed to the cyclones, causing significant secondary combustion and elevated cyclone temperatures.

PSNH tried to get the gas burner lit, but the gas burner would not light. The boiler finally tripped on low condenser vacuum pressure. PSNH finally got the gas burner to light, but could not get the bed temperature to the required 1050°F. PSNH contacted Unitil and Unitil boosted pressure by adjusting the regulator to the PSNH feed. This is the same regulator involved in Outage 5-B above.

Unitil advised PSNH that the gas pressure dropped in the winter time frame as cold weather placed increased demand on the gas transmission system. PSNH requested that their Unitil owned gas metering station be inspected. Unitil found a bad regulator cup which was replaced.

A subsequent meeting was held with Unitil resulting in a gas regulator replacement to allow a higher (50 psi) gas inlet pressure to allow for adequate PSNH gas pressure during Unitil gas system pressure fluctuations. In addition, Unitil performs an on-site inspection of their regulator twice a year.

D
5/3 – 0.1 days
While returning from Outage 5-C above, the unit was operating on one wood feeder and the gas burner. The second wood feeder was placed in service which reduces the boiler steam temperature and pressure due to moisture content of the increased fuel supply. As a result, the gas burner firing rate rapidly increased to compensate for the loss of required steam conditions. The increase in the gas burner firing rate resulted in a boiler trip due to high drum level. The gas burner was relit to try to reestablish proper steam conditions, but the unit tripped on low steam flow to the turbine. The fact that the unit has a limited size boiler drum makes this a low variation tolerance point during startup.

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E
6/14 – 0.1 days
A wood feeder pluggage occurred, causing a boiler swing that initiated a fuel feed trip due to high furnace pressure. PSNH lit the gas burner, but was not able to hold the required temperature of the bed. The unit eventually tripped due to low condenser vacuum. PSNH relit the bed and was able to return to service at a later time.

Note: PSNH made repairs to the condenser vacuum air leakage items during the 4/14 annual maintenance outage.

F
9/7 – 0.0 days
This outage was a repeat of Outage 5-E reported directly above.

G – (Outage Report OR-2013-08)
10/25 – 7.2 days
The unit was taken out of service to perform preventative maintenance for a period of 10 days. Energy prices were projected to be relatively low for the duration of the outage period, but expected to increase in the November timeframe. Therefore, PSNH scheduled overtime of 2/12's for the critical path 7 days a week to reduce replacement power costs. Plugged cyclones were determined to be critical path for this outage because of indications during operation. In addition, a bad shaft bearing on the A wood feeder screw needed attention and the circulating water motor bearing had a vibration that required attention.

During the outage, Thielch Engineering found that some areas of the in-bed tubes required pad welding repairs. Those repairs did not impact critical path. PSNH replaced bearings on both the A and B wood screws. In addition, an inspection was conducted on all 8 modules of the bag house requiring the replacement of 100 bags.

Work was completed and the unit was returned to service without incident.

H
12/17 – 0.3 days
Schiller CT was being brought on line to conduct testing. After approximately 30 seconds or less after phasing, CT-1 tripped and Schiller-5 lost power to the wood yard and the wood boiler building. Ultimately, Schiller-5 tripped due to the loss of steam.

The Schiller CT-1 unit was called to operate on 12/14. At that time the operator noticed a drop in load and quickly corrected the load level. The issue was monitored, but did not occur again. This issue appeared to be similar to the issue encountered on 12/12 so PSNH called the unit support vendor and scheduled a visit for 12/17.

On 12/17, a visual inspection was made with no abnormalities found. The CT unit was taken out of service to provide for a more detailed investigation. After the investigation, the support vendor made recommendations for small adjustments, but none of the adjustments would account for the erratic operation of the unit. It was decided to do a test run of the unit.

The start was initiated on automatic and the unit was brought up to normal speed. All parameters including phase angle indication appeared to be okay; however, the breaker would not close. The syncroscope was put into the manual position, the voltmeter handle was in the phase 2-3 position (normal position), and the breaker was closed. PSNH states that the Shift Supervisor verified that the voltmeters showed matching voltages, indicating lamps were showing a valid close condition, and the syncroscope was showing the needle in the 12 O'clock position. The Shift Supervisor assumed that the speed condition was met during the attempt to phase in the automatic mode which accounted for the speed needle resting in the 12 O'clock position.

PSNH reestablished service to the wood yard and the wood boiler building, brought the bed up to temperature, and returned the unit to service.

Schiller-6

The following outages took place at Schiller-6 during 2013.

A
1/27 – 3.7 days
The unit was taken off line due to suspected tube leaks. PSNH found a secondary superheater tube leak, repaired the leak and performed a hydro test of the boiler. The hydro test revealed that an additional tube leak in the secondary superheater outlet header. That leak was also repaired and the unit returned to service.

B
3/10 – 30.9 days
This outage was the annual planned maintenance overhaul for the unit. The outage had an ISO window of 49.3 days. PSNH planned the outage for 49.3 days based on straight time man power requirements and the actual outage was completed in 32.9 days. A Digital Control System (DCS) was installed in Unit #4 in 2012. An identical system was scheduled to be installed in Unit #6 during the Unit's 2013 annual overhaul.

Outage tasks were completed, and the unit returned to service ahead of schedule. PSNH did as much pre-outage work as possible on straight time prior to the actual outage to reduce outage time. PSNH was successful in performing the entire outage on straight time, thus reducing costs. The critical path remained the installation of the DCS throughout the outage.

C

4/10 – 0.1 days

The unit was returning to service from Outage 5-B above which included the installation of a new DCS on the unit. The unit was phased and while increasing load, a low pressure trip of the furnace and the unit occurred. PSNH investigation could not determine the cause of the trip at this time.

The unit remained off line during the night and was scheduled for startup at 7:00 am the next morning.

D

4/11 – 0.0 days

The unit was on line at 7:00 am on 4/11/13. While removing the last oil gun, the same problem as occurred in Outage 6-C above occurred. The unit was on automatic control at the time. Continued investigation found that the ID fan control caused too much air to flow through the boiler, causing the boiler pressure to drop which tripped the unit. PSNH made a tuning adjustment to the signal to the ID fan. With that adjustment, the unit returned to service.

E

4/12 – 0.5 days

The unit remained off-line overnight and was brought on line at 7:00 am on 4/12. PSNH continued to test the newly installed DCS. When testing was complete, the unit was made available for dispatch to the ISO-NE.

F

6/4 – 1.4 days

The unit was on economic reserve. PSNH took the unit out of service due to a boiler leak. PSNH found a leak in the economizer and repaired it on straight time. When repairs were made, the unit returned to service.

G

6/24 – 0.1 days

The unit was in reserve shutdown when it was called to perform a cold start by the ISO-NE.

While operating in manual mode, the CO allowed the ID fans to speed up excessively by setting the dampers too high. That action allowed the unit to have two low furnace pressure trips that caused the unit to miss its required startup time as committed to the ISO-NE.

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H

12/28 – 2.6 days

The unit was on line and was required to be taken off line due to excessive water usage. Because of the prices in the energy market, PSNH worked shifts 24/7 to bring the unit back to service. PSNH repaired 2 tube leaks; pad-welded 3 other tube leaks, and returned the unit to service.

Evaluation (Except for Outages 4-F and 6-G)

Accion reviewed the above outages and found them either to be reasonable and not unexpected for this unit and its vintage, or necessary for proper operation of the unit. Accion concluded that PSNH conducted proper management oversight.

In addition, Accion performed a station walk down on 12/11/14. Accion found the station to be reasonably tidy and clean. Accion saw that various motors, pumps had been repaired or replaced giving support that required maintenance is being performed. Accion also noted that all fire equipment inspections were current.

Outage Schiller 4-F

In this outage, the CO did not properly set the air damper automatic set point as required by procedure. A CO is the senior operator in a power plant and is expected to possess required knowledge for proper unit operation.

In this instance, the CO did not demonstrate the level of knowledge of plant operations required for the position and follow procedure. Accion recommends that replacement power costs related to this outage not be recovered from customers.

Outage 6-G

In this outage, the CO did not properly set the air dampers causing the unit to trip on low furnace pressure. A CO is the senior operator in a power plant and is expected to possess required knowledge for proper unit operation.

In this instance, the CO did not demonstrate the level of knowledge of plant operations required for the position and follow procedure. Accion recommends that replacement power costs related to this outage not be recovered from customers.

Exhibit MDC-6 Hydroelectric Unit Outages for 2013

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Hydroelectric Unit Outages For 2013

The following sections describe the outages at Public Service Company of New Hampshire's ("PSNH's") hydroelectric ("hydro") stations during 2013. The outage durations listed have been stated as the actual duration of the total outage regardless of whether there was water to run the unit or not. Accion Group LLC. ("Accion" or "Accion Group") indicates water availability during any portion of the outage by a "Y" or "N" next to the outage designation. In order to simplify the outage descriptions, a separate outage description appears as "S" where multiple unit stations were out of service for the same duration and reason. If the units in the station outages are not returned to service within an hour of each outage, the outages are separated into and as reported as single unit outages. Multiple unit outages list the units involved in the outage and the text ties the event together.

In 2013, the PSNH hydro fleet generated 363,838 MWh of energy, which is approximately 10 percent greater than 2012 generation and approximately 7 percent greater than the average twenty-year generation. In addition, approximately 2,720 MWh were lost at Amoskeag station and approximately 840 MWh were lost at Ayers Island station, both due to output restrictions related to generator step up transformer replacements. Maintenance schedules were revised to accommodate additional flow wherever possible.

In 2013, there were 24 hydro unit outages related to transmission and distribution system disturbances. Of those 24 outages, 11 were related to outages along the 355 34.5kV line from Lost Nation to Colebrook which has known vegetation management and mis-coordination problems that are in the process of being addressed.

Amoskeag Station

There were no major planned projects at Amoskeag station in 2013.

In August 2013, oil sample testing of the two generator step transformers (TB-354 and TB-355) showed that TB-355 had indications of internal arcing indicated by gasses in the oil and insulation degradation resulting in a high power factor. A replacement transformer was required. While TB-355 was being replaced, station output had to be restricted to 10 MVA (9 MW plus MVAr) through the remaining TB-354 transformer. Total station output was limited to approximately the output of 1 and one-half units. Lost power conditions related to the transformer replacement are listed as a station derate during TB-355 transformer replacement. Lost generation was approximately 1,175 MWh in September, 0 MWh in October, 720 MWh in November, and 825 MWh in December (2,720 total MWH). Please see Outage S-E, below.

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Station Outages

S-A

2/4 – 0.0 days – Y

All three units tripped due to a failure in the emergency generator power module. The power module lost the ability to sense normal station service and activated the emergency transfer switch which transferred station service to the emergency position. The switch then tried to cycle back to the normal position but hung up part way during the transfer resulting in the trip of the units.

Accion notes that the transfer switch problem was identified in 2012 and PSNH had planned to replace the switch during the planned T&D outage on 2/19, Outage S-B, below.

S-B **–** (Related to a T&D event)

2/19 – 0.1 days – Y

This planned outage was taken to isolate the 3450 breaker cables for replacement. The cables were isolated and the units returned to service.

S-C **–** (Related to a T&D event)

2/22 – 0.0 days – Y

This planned outage was taken to reconnect the new 3450 breaker cables. The cables were reconnected and the units returned to service.

S-D

6/26 – 0.1 – Y

The units tripped due to a failure of a transducer in the inflatable flash board's logic circuit. When the transducer failed, it failed to the high water maximum position which caused the automatic deflation of the flashboards. As the pond level decreased, the pond level control system backed down the units and eventually shut them down.

PSNH investigation found that a power surge coupled with a weak ground had caused the transducer failure. The inflatable flashboards were put into manual control to rebuild the pond, the transducer was replaced, the ground was enhanced, and the units returned to service. Please also see Outage 2-F, below.

S-E

8/19 – 1.3 days – Y

Earlier oil sample testing was conducted on the two generator step up transformers, TB-354 and TB-355. The oil sampling found gas in the TB-355 transformer oil indicating possible internal arcing and an overall high power factor for the unit. This planned outage was taken to provide adequate electrical clearances for more detailed testing of the transformers. Testing revealed that the TB-355 transformer was not serviceable and that it should not be put back into service.

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Station output had to be restricted to 10 MVA (9 MW plus MVAr) through the remaining TB-354 transformer with the addition fins and fans. PSNH was unable to locate a mobile transformer that would have greater capability. Total station output was limited to approximately the output of 1 and one-half units under this configuration.

PSNH decided to replace both TB-354 and TB-355 with a 24 MVA dry type transformer because of potential similar problems with TB-354. The transformer had to be manufactured from scratch resulting in the station output was restricted from 8/20/13 through 9/30/14 resulting in lost generation at the station of 2,720 MWH in 2013.

Accion notes that this outage overlaps two reporting years. The majority of the outage time occurred in 2014, so according to the convention developed; this outage will be addressed in 2014.

S-F
10/9 – 0.1 days – Y
This outage was taken to perform the ISO-NE Black Start test for the station. The test was successfully conducted and the units returned to service.

Amoskeag - 1

A
2/11 – 4.3 days – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed for power production. PSNH conducted the outage on straight time and placed the unit in service overnight when possible. The inspection was completed and the unit returned to service.

B
9/13 – 6.2 days – Y

C
9/23 – 1.2 days – Y
Station derate during TB-355 transformer replacement.

D
11/2 – 1.3 days – Y
Station derate during TB-355 transformer replacement.

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E
11/19 – 1.0 days – Y
Station derate during TB-355 transformer replacement.

F
11/27 – 8.1 days – Y
Station derate during TB-355 transformer replacement.

G
12/6 – 4.0 days – Y
Station derate during TB-355 transformer replacement.

H
12/23 – 8.5 days
Station derate during TB-355 transformer replacement.

Amoskeag – 2

A
1/7 – 4.3 days – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed for power production. PSNH conducted the outage on straight time and placed the unit in service overnight when possible. The inspection was completed and the unit returned to service.

B
6/21 – 0.1 days – The unit tripped due to low oil level in the lower guide bearing. PSNH investigation found that the rod for the float that controls the oil pump had come out of its guide, jammed, and prevented the oil pump from starting. Earlier in the day, PSNH stated that an operator mechanic found the oil pump in continuous operation. The stay nut holding the float rod to the switch had come off. The operator replaced the stay nut but did not realize that the float rod had come out of its guide as that equipment was not visible.

C
9/1 – 4.3 days – Y
Station derate during TB-355 transformer replacement.

D
9/13 – 6.2 days – Y
Station derate during TB-355 transformer replacement.

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E
9/23 – 1.2 days – Y
Station derate during TB-355 transformer replacement.

F
10/24 – 0.2 days – Y
The unit tripped due to a signal from a transducer in the inflatable flash board's logic circuit. When the transducer activated, it went to the high water maximum position which caused the automatic deflation of the flashboards. As the pond level decreased, the pond level control system backed down the unit and eventually shut it down. The ESCC believed that the unit was taken off line due to the pond level control and did not inform hydro personnel of the shutdown. No alarms are transmitted to the ESCC for normal pond control operation or deflation of the inflatable flashboards.

PSNH found that the transducer did not fail but produced an inaccurate signal. The inflatable flashboards were raised in the manual mode, pond level was rebuilt, the transducer was replaced, and the unit returned to service.

G
11/2 – 1.3 days – Y
Station derate during TB-355 transformer replacement.

H
11/4 – 0.3 days – N
The unit was taken off line to perform scheduled governor maintenance because of sticking issues at the 60% wicket gate opening. Adjustments were made to the governor cable sheave (feedback to the servo that operates the wicker gates) and the unit returned to service.

I
11/19 – 1.0 days – N
Station derate during TB-355 transformer replacement.

J
11/27 – 8.1 days – Y
Station derate during TB-355 transformer replacement.

K
12/6 – 4.0 days – Y
Station derate during TB-355 transformer replacement.

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L

12/23 – 8.5 days

Station derate during TB-355 transformer replacement.

Amoskeag – 3

A

1/28 – 3.2 days – N

This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed for power production. PSNH conducted the outage on straight time and placed the unit in service overnight when possible. The inspection was completed and the unit returned to service.

B

9/1 – 4.3 days – Y

Station derate during TB-355 transformer replacement.

C

10/2 – 0.1 days – Y

The unit tripped due to a signal from a transducer in the inflatable flash board's logic circuit. When the transducer activated, it went to the high water maximum position which caused the automatic deflation of the flashboards. As the pond level decreased, the pond level control system backed down the unit and eventually shut it down.

PSNH investigation found that the bladder system appeared to be working properly, rebuilt the pond level, and returned the unit to service. Please see Outage 2-F above.

D

10/4 – 0.3 days – Y

The unit tripped due to a signal from a transducer in the inflatable flash board's logic circuit. When the transducer activated, it went to the high water maximum position which caused the automatic deflation of the flashboards. As the pond level decreased, the pond level control system backed down the unit and eventually shut it down.

PSNH investigation found that the bladder system appeared to be working properly, rebuilt the pond level, and returned the unit to service. Please see Outage 2-F above.

E

10/31 – 0.0 days – Y

The unit tripped due to low oil level in the lower guide bearing. PSNH found that the linkage for the oil pump float was sticking. The linkage was cleaned and the unit returned to service.

Ayers Island

The major planned projects at Ayers Island for 2013 were the replacement of the TB-19 generator step-up transformer and the TB-8 breaker.

While TB-8 and TB-19 were being replaced, station output had to be restricted to 7 MVA (6 MW plus MVAr) through the mobile transformer. Total station output was limited to approximately the output of two units. Outages are listed only as a Station derate during TB-8 and TB-19 replacement. Lost generation was approximately 475 MWh in November and 365 MWh in December (840 total MWh). Please see Outage S-B, below.

Station Outages

S-A – (Related to a T&D event)
2/17 – 0.0 days – Y
The A-111 115kV line between Webster and Pemigewasset substations faulted and tripped transformer TB-88 at Pemigewasset substation resulting in the outage of the 3149, 3114, and 345 34.5kV lines. Ayers Island hydro station is connected radially to the Pemigewasset substation via the 3149 34.5kV line. The lines were restored and the units returned to service. The 115kV fault was due to a tree that was outside of the 115kV right-of-way. Accion notes that this right-of-way had not yet been scheduled to address these danger trees.

This is an over trip condition that will be addressed in the station studies.

S-B
9/30 – 0.4 days – Y
Station output had to be restricted to 7 MVA (6 MW plus MVAr) through the available 7 MVA mobile transformer. PSNH was unable to use its 10 MVA mobile transformer as it was in use by the distribution department at this time. Total station output was limited to approximately the output of two units under this configuration resulting in the station output restricted from 9/30/13 through 3/21/14 resulting in lost generation at the station of 840 MWh in 2013.

Accion notes that this outage overlaps two reporting years. The majority of the outage time occurred in 2013, so according to the convention developed; this outage will be addressed in 2013.

S-C – (Related to a T&D event)
10/7 – 0.0 days – Y
A tree caused a fault on the radial 3114 34.5Kv from Pemigewasset to Ragged Mountain substations. The units at Ayers Island tripped for this disturbance which is an over trip condition and will be addressed in the station studies.

S-D
10/16 – 0.5 days – Y
This outage was required to maintain safety clearances during the replacement of the TB-8 breaker and TB-19 step up transformer.

S-E
10/23 – 0.3 days – Y
This outage was required to maintain safety clearances during the replacement of the TB-8 breaker and TB-19 step up transformer.

S-F
12/3 – 1.3 days – Y
This outage was required to maintain safety clearances during the replacement of the TB-8 breaker and TB-19 step up transformer.

S-G
12/4 – 0.0 days – Y
This outage was required to maintain safety clearances during the replacement of the TB-8 breaker and TB-19 step up transformer.

Ayers Island – 1
A
2/25 – 14.1 days – N
This planned 12-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. Non-routine work included the disassembly of the middle guide bearing oil reservoir and pump and drive assemblies to address oil leaks. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight. PSNH diverted manpower to other locations where outage timing was more important. PSNH's approach increased the time of the outage to perform the work scope.

B
5/22 – 0.0 days – Y
The unit tripped off line due to loss of oil to the thrust bearing. An intermittent blockage in the lube oil system was suspected possibly related to the work performed during the annual inspection outage. The unit was inspected and adjustments were made to the oil flows between the thrust bearing and middle guide bearing. The unit was monitored, found to be operating satisfactorily, and returned to service.

Accion notes that the oil was drained and further cleaning and flushing of piping was performed at a time during lower river flows on 6/6. In addition, PSNH is instituting a gasket installation procedure to augment its foreign material exclusion requirements.

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C
5/31 – 0.0 days – Y
The unit tripped due to a similar event as occurred in Outage 1-B above. PSNH found evidence of excess silicone type sealer used during the re-assembly of bearing housing and piping. The unit was inspected and oil flows monitored, found to be operating satisfactorily, and was returned to service.

AccIon notes that the oil was drained and further cleaning and flushing of piping was performed at a time during lower river flows on 6/6. In addition, PSNH is instituting a gasket installation procedure to augment its foreign material exclusion requirements.

Ayers Island – 2

A
1/21 – 7.4 – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. Additional governor adjustments were made the following week. PSNH conducted the outage on straight time and did not place the unit in service overnight. PSNH diverted manpower to other locations where outage timing was more important. PSNH's approach increased the time of the outage to perform the work scope.

B
2/6 – 0.1 days – Y
The unit tripped due to loss of DC control power. While changing a burnt light bulb for the breaker position lamp, the light socket failed causing a short to ground. The short caused the DC fuse to blow which tripped the unit. PSNH found that the socket was old and brittle causing the failure. The socket was replaced and the unit was returned to service.

C
12/7 – 1.6 days – Y
Station derate during TB-8 and TB-19 replacement.

D
12/23 – 2.8 days - Y
Station derate during TB-8 and TB-19 replacement.

Ayers Island – 3

A
11/1 – 2.7 days – Y
Station derate during TB-8 and TB-19 replacement.

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B
11/18 – 1.7 days – Y
Station derate during TB-8 and TB-19 replacement.

C
11/26 – 3.8 days – Y
Station derate during TB-8 and TB-19 replacement.

D
11/30 – 2.7 days – Y
Station derate during TB-8 and TB-19 replacement.

Canaan

There were no major planned projects completed at Canaan in 2013.

Canaan – 1

A
4/15 – 0.3 days – Y
The unit tripped due to los of governor oil pressure. The governor oil pump breaker tripped resulting in the slow loss of governor oil pressure resulting in the unit trip. PSNH suspected that the breaker was failing due to age and replaced it with a spare. The unit returned to service without incident.

B
4/23 – 0.3 days – Y
Please see Outage C, below.

C
4/25 – 0.3 days – Y
Planned Outages B and C were taken to investigate an intermittent issue where the generator breaker would not open as required. The cause was suspected to be residual magnetism and a sticking relay plunger. The tripping lever was replaced with a non-metallic lever that directly trips the breaker when the field opens or a lockout occurs. The process was tested several times and the unit was returned to service.

D
5/7 – 2.1 days – Y
This planned outage was taken to repair damaged flash boards and support pins. The pond was lowered to dam crest level, damaged boards and pins were removed and replaced, and large trees and debris were removed from the dam. The pond was refilled and the unit returned to service.

E– (Related to a T&D event)
6/2 – 0.2 days – Y
A tree faulted the 355 34.5kV line near North Strafford. The 355 line tripped at Lost Nation resulting in the trip of the Canaan unit. The 357 breaker at Canaan also tripped due to overcurrent into the fault. The line was cleared and the unit returned to service.

The Distribution department confirmed that the 357 relay had been reset in according with the setting changes resulting from the station voltage study. PSNH will replace these older overcurrent relays in 2015 with microprocessor relays that are more accurate and that will be able to provide protection personnel with much more detailed information during system disturbances. Please also see Outage H below.

F
6/3 - 0.3 days – Y
The unit tripped due to low governor oil pressure. Investigation found that the overloads on the governor oil pump motor starter activated. The overloads were reset and the motor starter was placed in the manual position allowing the motor to run on a continuous basis and controlled by the oil pressure switch. The unit was returned to service.

Accion notes that PSNH made adjustments to the oil pump system during the annual maintenance outage in July which reduced the load on the governor oil pump motor to zero during startup. This work allowed the motor to be placed back in the automatic position.

G
6/10 – 0.2 days – Y
This outage was scheduled to remove the primary shaft driven turbine bearing oil pump because of inadequate output. The pump was unable to be replaced due to mounting bolt access issues, so a temporary pump was installed allowing the unit to return to service. This issue was also addressed during the July annual maintenance outage.

H – (Related to a T&D event)
7/9 – 0.0 days – Y
Loggers felled a tree onto the 355X10 34.5kV line above Canaan hydro. The 355X10 recloser operated to clear the fault, however, the 357 breaker at Canaan hydro also misoperated. The line was cleared and the unit returned to service.

This is a known miscoordination condition. Please see Outage E above.

I – (Related to a T&D event)
7/19 – 0.6 days – Y
A tree came in contact with the 376 34.5kV line between Lost Nation and Whitefield substations. The 357 breaker at Canaan hydro over tripped. This is a known miscoordination condition. Please see Outage E above.

During this event, the pager activated communication link sending the breaker change of status information between the unit and the ESCC failed due to a phone line issue. No alarms are sent to the ESCC for the tripping of this breaker as there is not full SCADA (Station Control and Data Acquisition) control at this station. Communications were restored and the unit returned to service.

J
7/22 – 11.4 days - Y
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. Once the unit was dismantled, emergent work was required for the turbine bearing. The outage was extended to perform an extensive clean up due to a minor oil sheen in then tailrace. PSNH elected to perform this work on a straight time basis. At the end of the outage, an oil sheen was observed coming from the wheel pit drain. Absorbent booms were deployed in the tailrace area. The unit was dewatered and PSNH personnel again cleaned the accumulation of oil and grease in the wicket arm area. The unit was watered up and again an oil sheen was observed in the tail race area. PSNH dewatered the unit and secured contractors to pressure wash the affected areas. After the contractors completed their work, the unit was returned to service without incident.

PSNH found that clean up procedures called for cleanup of oil and grease residue but did not call for pressure washing of oil and grease residue. PSNH altered its procedures at this and other stations to include pressure washing oil and grease residues that can make their way into the tailrace.

K – (Related to a T&D event)
8/30 – 0.0 days – Y
Lightning caused a trip and reclose of the 355 34.5kV line from Lost Nation to Colebrook substations. This operation caused the trip of the Canaan unit and the operation of the 357 breaker at Canaan. The unit was reset and returned to service.

This is a known miscoordination condition. Please see Outage E above.

L – (Related to a T&D event)
9/24 – 0.0 days – Y
This outage was a result of the incident that occurred at the Berlin 115kV substation during the interconnection of the Burgess Gas power plant.

The full explanation and disposition appears in the discussion of Lost Nation CT Outage D.

M **–** (Related to a T&D event)
10/7 – 0.0 days – Y
The Q-195 Whitefield to Moore station 115kV line was out of service when the X-178 three terminal line between Whitefield, Littleton, and Beebe River substations tripped resulting in the loss of all 115kV sources into the Whitefield substation. Whitefield in turn feeds the Lost Nation and Berlin substations. Loss of the Lost Nation substation tripped the unit. No cause for the operation of the X-178 line was found, however storms were in the area. The system was restored and the unit returned to service. Please see Smith hydro Outage 1-D.

Accion notes that Lost Nation CT would have also been outaged by this event, but it was on its annual overhaul.

N **–** (Related to a T&D event)
10/29 – 0.0 days – Y
This unscheduled outage was taken so that a failed switch insulator on the 355X recloser south of the Canaan station could be isolated and repaired. The switch was isolated and the unit returned to service.

O **–** (Related to a T&D event)
11/19 – 0.0 days – Y
A temporary fault on the distribution side of the 355 recloser at Colebrook caused the recloser to trip and reclose. The disturbance tripped the unit. The unit was reset and returned to service.

This outage event was due to mis-coordination.

P **–** (Related to a T&D event)
11/24 – 0.2 days – Y
The unit tripped at Lost Nation due to a tree contact from outside of the right-of-way on the 355 34.5kV line. Conditions at the time were windy. The tree was removed, the system was restored, and the unit was returned to service.

PSNH had agreed to remove danger trees on the 355 34.5kV line due to the number of tree contacts that had been experienced. The line was scheduled to have right-of-way mowing performed in 2013, but a review of right-of-way conditions led PSNH to the decision to perform full width right-of-way clearing instead. In order to perform the full width clearing, easement boundaries had to be established. The clearing project commenced in 2014 and is to be completed in 2015.

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Q – (Related to a T&D event)
11/27 – 0.2 days – Y
The 355 34.5kV line tripped at Lost Nation due to the failure of a post insulator on the line and tripped the unit. The system was restored and the unit returned to service.

The 357 breaker at Canaan hydro over tripped. This is a known miscoordination condition. Please see Outage E above.

R – (Related to a T&D event)
12/21 – 0.0 days – Y
The 355 34.5kV line tripped and reclosed at Lost Nation which tripped the unit. PSNH patrolled the line and nothing was found. The system was restored and the unit returned to service.

The 357 breaker at Canaan hydro over tripped. This is a known miscoordination condition. Please see Outage E above.

Eastman Falls

There were no major projects completed at Eastman Falls in 2013.

Station Outages

S-A – (Related to a T&D event)
10/15 – 23.9 days – Y
The outage was taken so that brown glass insulators in the station could be replaced. This outage was coordinated to coincide with the annual maintenance overhaul of the largest unit in the station.

Brown glass insulators have been identified by PSNH to be unreliable and PSNH has established a system wide replacement program. PSNH states that there are approximately a dozen stations remaining on the replacement list and that 1 to 2 substations are completed each year.

S-B – (Related to a T&D event)
12/5 – 0.1 days – Y
The station tripped on high reactive output when the 34.5kV voltage at Webster substation one mile away was lowered by the adjustment of the load tap changer (LTC) on the 115/34.5kV transformer TB-37. The excess VAr relay at Eastman is set at 1.6 MVAr and was activated by excessive range on the LTC. PSNH replaced the LTC controller on TB-37 at Webster and cleaned/adjusted its associated breaker.

Eastman Falls-1

A

1/28 – 14.3 days – Y

This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. During the inspection, PSNH found that the lower guide bearing needed replacement requiring the extension of the original outage. PSNH conducted the outage on straight time and did not place the unit in service overnight.

B

7/5 – 0.1 days – Y

The unit tripped due to high spider bearing temperatures. PSNH cites high ambient and building temperatures causing the high bearing temperatures.

PSNH had installed tarps to protect the unit from leaks in the roof. In so doing, unit ventilation was blocked allowing the unit to heat up. PSNH installed high velocity fans on a temporary basis which cooled the unit. After the unit was cooled, it was returned to service.

Accion notes that the roof has been fixed and there have been no further ventilation problems. In addition, this station has been added to the summer ventilation program to ensure adequate ventilation during warmer temperatures.

C

7/7 – 0.0 days – Y

The unit tripped on reverse power. The dispatcher at the ESCC reported that upon starting the unit, it ramped up to full load. The dispatcher reported sending 23 lower output pulses to the unit and it did not respond. After 30 minutes, the dispatcher sent an additional 3 lower pulses to the unit. A hydro operator at the station placed the unit in manual, sent multiple pulses to the unit in both the up and down direction, found the unit responded correctly, and returned the unit to service.

PSNH investigation found that the incident was due to dispatcher inattention at the ESCC. This matter has been addressed as part of dispatcher training.

Eastman Falls – 2

A

1/3 – 0.1 days – N

The unit was taken out of service due to the creep detector alarm activation during shutdown which caused the head gate to close shutting water off to the unit. The creep detector alarm is activated when the unit is shut down and the unit does not stop rolling after a specified period of time. After the specified time period, the head gate is automatically lowered in an emergency down condition. PSNH examined the unit, exercised the head gate, exercised the intake filler gate, found nothing irregular and returned the unit to reserve status.

B
1/5 – 4.4 days – Y
The unit failed to start when requested to do so due to loss of hydraulic pressure. PSNH found that the main hydraulic hose had ruptured. A new hose was ordered and replaced when it arrived. The hose replacement required the removal of the hydraulic pump. When the hose was replaced, the unit was placed into reserve status.

C
1/10 – 4.4 days – Y
The unit was taken out of service due to lube oil in the cooling water discharge. PSNH investigation revealed that the oil leak was due to the guide bearing lube oil seal in the bestobell area moving out of position because it was not tight enough. A new seal was installed and silicone was used to prevent the seal from moving. In addition, the silicone was allowed to dry over the weekend. The unit was assembled and placed back into service without incident.

PSNH has modified its procedures at all stations to include the use of silicone including a drying time where seal movement is an issue.

D
10/10 – 29.0 days – N
The unit annual inspection was started just prior to the planned station outage to replace all brown glass insulators to reduce the possibility of insulator failure. Please see Outage S-A above.

A five-day planned outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight. PSNH diverted manpower to other locations where outage timing was more important if required. PSNH's approach increased the time of the outage to perform the work scope.

E
12/29 – 0.1 days – Y (Related to a T&D event)
A limb came into contact with the 1X4 34.5kV line fed out of Eastman Falls and locked out. In addition to the proper isolation of the fault, Eastman G2 also over tripped on overspeed conditions. Unit creep protection was also activated during the shutdown. PSNH attributed the loss of the unit due to loss of auxiliary systems without a definite cause identified. The system was restored and the unit returned to service?

F

12/29 – 0.5 days – Y

The unit was returning to service from outage 2-E directly above when it failed to start. The failure to start was caused because the unit could only build voltage to 75 Volts and the synchronizer would not turn on. PSNH investigation found that one of the primary potential transformer fuse blocks was not properly installed and loose. PSNH states that the design of the contact clips makes them difficult to verify proper seating upon installation. PSNH adjusted the fuse retaining clips and returned the unit to service.

PSNH has reinforced the proper technique of fuse installation with its operators.

Garvins Falls

There were no planned major projects completed at Garvins Falls in 2013.

Station Outages

S-A

5/9 – 0.3 days – Y

The units were taken off line for diver safety while the fish louvers were being installed for the season. The louvers were partially installed and the units returned to service. The remainder of the work was completed with the units in service.

S-B

10/4 – 0.7 days – Y

A station outage was taken to assure that oil from the G4 sump pump pit did not get dispersed. PSNH investigation found that the float switch for the G4 sump pump failed to operate resulting in the oil intrusion. A minor amount of oil was found in the sump pump line that had entered the tailrace. Absorbent booms were deployed and no additional oil was evident by morning. PSNH determined that the sump pump line had not been flushed as required by procedure.

S-C

10/8 – 0.0 days – Y

A scheduled station outage was required to perform black start testing capability as required by the ISO-NE. Testing was successful and the station returned to service.

S-D

11/8 – 0.2 days – Y

This station shutdown originated from Outage 4-C. In that outage, the unit was in reserve shutdown and was taken out of service due to the failure of the sump pump in the outer shifting ring area. The sump pump failure resulted in water rising in this area to a point where it entered the lower guide bearing oil reservoir which ultimately overfilled. The overfill entered a second sump area which is designed to trap water from the main shaft seal for the unit. That sump pumped a small amount of the oil/water mixture into the draft tube resulting in a minor oil sheen on the water.

A contractor cleaned up the oil sheen, the sump pump was replaced, and the station returned to service. Upon starting the unit, another oil sheen resulted due to residual oil that was in the draft tube because an oil line had not been flushed. It was the second oil sheen that resulted in this station outage. Please see Outage 4-C, below.

S-E
11/25 – 0.2 days – Y
A complete station outage was scheduled for diver safety to remove a broken section of the tuff boom debris barrier which deflects debris from the station intake. Repairs were made and the station returned to service.

S-F
12/6 – 0.1 days – Y
A complete station outage was scheduled to remove fish passage louver equipment for the winter season. The louvers were removed and the station returned to service.

Garvins Falls-1

A
7/29 – 9.2 days – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight. In addition, the outage was extended so that personnel could be used at another location where potential power production would be lost.

B
11/27 – 1.6 days – Y
The unit tripped and failed to restart. PSNH investigation found that the unit would not phase and tracked the problem to the overspeed logic card that controls the synchronous speed of the machine. Several attempts to manually phase the unit failed. Personnel were not available at 9 pm so the decision was made to respond in the morning.

On 11/28, the unit was locally phased manually after an adjustment was made to the actuator and the overspeed card, overspeed relay, and associated wiring were checked.

Garvins Falls – 2

A
6/10 – 0.2 days – Y
The unit tripped due to a high bearing temperature on the speed increaser. PSNH investigation found that the motor for the cooling fan that cools the speed increaser failed resulting in the high bearing temperatures. The motor was replaced and the unit returned to service.

B
7/29 – 0.3 days – Y
A scheduled outage was taken for diver safety during the installation of tail water panels for Unit #1 during its annual inspection. The work was completed on Unit #1 and Unit #2 returned to service.

Note: Unit #1 and #2 share the same inlet and discharge water facilities.

C
8/19 – 4.3 days – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight.

D
12/13 – 0.2 days – Y
The unit tripped due to operation of the overspeed relay. PSNH investigation found that there was an issue with the mechanical overspeed switch. The switch was tested mechanically and electrically and mechanical adjustments were made. The unit returned to service without incident.

E
12/16 – 1.9 days – Y
The unit tripped due to operation of the overspeed relay. Investigation found that the exciter voltage suppressor had failed. In addition, PSNH found a burnt coil on the G2B lockout relay and wear grooves on the fly ball assembly that operates the overspeed. The voltage suppressor and coil were replaced, the overspeed fly ball assembly was machined, and the unit returned to service. The3 wear was not noticed during the 12/13 outage.

Garvins Falls – 3

A
5/10 – 0.1 days – Y
Pond control had previously started the unit and it was operating at very low load while waiting for the pond control to pulse the unit up. The governor drifted downward and unit output went below zero resulting in a unit trip because of reverse power. PSNH investigation found that the issue was with the governor mechanism play and that it could not be repaired due to the age of the controls. To prevent the issue from reoccurring, PSNH changed the logic in the pond control to avoid unit drift into reverse power conditions below 500kW.

B
7/26 – 0.2 days – Y
The unit tripped due to a high lower guide bearing temperature. PSNH investigation found that there was low oil in the lower guide bearing oil reservoir which resulted in the high bearing temperature. In addition, PSNH found that both a relay that starts the oil pump at low oil level and the low oil trip timer had failed. Both the low oil trip timer and the oil pump relay were replaced and the unit returned to service.

C
9/30 – 4.3 days – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight.

Garvins Falls – 4

A
5/31 – 0.1 days – Y
The unit tripped due to high spider bearing temperature. PSNH cites extremely high ambient and building temperatures as the cause for reaching the high bearing alarm and trip point settings to be reached. PSNH set both the alarm and trip set points 10^{o}C higher and returned the unit to service.

At PSNH, Garvins, Ayers Island, Amoskeag, Jackman, and Smith stations underwent a review on 4/15 to implement summer ventilation/temperature modifications by 6/1. PSNH is reviewing their efforts to ensure that early readiness takes place.

B
9/25 – 0.0 days – Y
The unit was taken off line to sand the exciter brushes. This is a routine operation scheduled by the operator when arcing is noted on the exciter brushes during operator rounds to prevent damage to the collector rings and commutator. The brushes were sanded and the unit returned to service.

C
11/5 – 2.8 days – N
The unit was in reserve shutdown and was taken out of service due to the failure of the sump pump in the outer shifting ring area. The sump pump failure resulted in water rising in this area to a point where it entered the lower guide bearing oil reservoir which ultimately overfilled. The overfill entered a second sump area which is designed to trap water from the main shaft seal for the unit. That sump pumped a small amount of the oil/water mixture into the draft tube resulting in a minor oil sheen on the water.

A contractor cleaned up the oil sheen, the sump pump was replaced, and the station returned to service. Upon starting the unit, another sheen resulted due to residual oil that was in the draft tube. It was the second oil sheen that resulted in the station outage, Outage S-D above. PSNH found that an oil line to the draft tube had not been flushed.

D
12/16 – 4.2 days – N
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight.

Gorham

There were no major planned projects completed at Gorham in 2013.

Station Outages

S-A – (Related to a T&D event)
6/10 – 0.0 days – Y
The TB-47 115/22kV transformer differential operated at the Berlin substation. Units #1, #2, and #3 at Gorham tripped due to overvoltage conditions. The system was returned to operational status and the units returned to service.

PSNH investigation as to the reason for the unit trips is not complete.

S-B – (Related to a T&D event)

10/7 – 0.0 days – Y

This outage is the outage of the X-178 115kV line that caused an interruption to entire North Country. Please see Canaan Outage M.

Gorham – 1

A

8/12 – 4.3 days – N

This planned five-day outage was taken to perform the annual inspection of Unit #1 and Unit #2 (common intake). A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight.

Gorham – 2

A

8/12 – 4.3 days – N

This planned five-day outage was taken to perform the annual inspection of Unit #1 and Unit #2 (common intake). A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight.

Gorham – 3

A

8/28 – 0.0 days – Y

The unit tripped when the dispatcher at the ESCC began backing the unit down in response to a low minimum bypass flow alarm. The trip occurred after the first lower pulse was issued. Flow information indicated that there was not an issue with bypass flow levels. The unit was returned to service without incident. Please see Outage B, directly below.

B

8/30 – 3.0 days – Y

The unit was taken out of service in response to the minimum bypass flow alarm toggling in and out. Again, PSNH determined that there was not an issue with bypass flow levels. PSNH decided to keep the unit off line until 9/3. On 9/3, PSNH found that an apparent lightning strike on 8/28 had caused an input card to the RTU to fail resulting in erroneous bypass flow levels being generated.

The input card was isolated, the unit was returned to service, and repairs were made at a later date.

C

9/3 – 2.3 days – N

This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight.

D – (Related to a T&D event)

9/11 – 0.1 days – Y

The 352 34.5kV line between Berlin and Gorham tripped and reclosed at both ends. Unit #2 and #3 were on line at Gorham hydro. Unit #3 over tripped[21] for this disturbance. PSNH believes that loose relay tolerance is the issue. The system was restored and the unit returned to service.

E

10/27 – 0.4 days – Y

The unit tripped due to low actuator oil pressure. PSNH investigation found that the actuator oil pump had failed resulting in the low oil pressure. The actuator oil pump and filter were changed and the unit returned to service.

F

11/18 – 0.2 days – Y

The unit tripped due to low actuator oil pressure. PSNH investigation found that the new actuator oil pump installed in Outage E directly above had failed resulting in the low oil pressure. The actuator oil pump, oil filter, and hydraulic oil were changed and the unit returned to service.

Gorham – 4

A

3/9 – 0.1 days – Y

The unit tripped due to low actuator oil pressure. PSNH investigation found that the actuator oil pump had failed resulting in the low oil pressure. The actuator oil pump was changed and the unit returned to service.

This pump is similar to those involved in Outages 3E and 3F above. PSNH checked stock to ensure that there was not a bad lot of pumps. The remaining pumps in stock were found to be okay.

[21] An over trip is the operation of equipment that is not in the zone of protection when a disturbance occurs.

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B

9/9 – 4.2 days – N

This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The water flow was low at this time and the generator was not needed to capture the existing flow. PSNH conducted the outage on straight time and did not place the unit in service overnight. In addition, the unit was dewatered on a Friday adding a weekend to the outage.

Hooksett

There were no major planned projects completed at Hooksett in 2013.

Hooksett – 1

A

5/21 – 0.0 days – Y

The unit was taken off line to clean the exciter. Two worn exciter brushes were also replaced. The operators inspected the exciter and found worn electrical leads on the collector ring brushes. The foreman was notified and the unit was returned to service. Please see Outage B, directly below.

B

5/21 - 0.1 days – Y

PSNH took the unit off line to address worn collector ring brush wires identified earlier that day in Outage A directly above. Seven collector ring brushes were replaced and the unit returned to service.

C

7/12– 0.1 days – Y

The unit tripped due to low oil in the lower guide bearing oil tank reservoir. PSNH investigation found that the Mercoid switch for the lower guide bearing oil pump was stuck in the off position resulting in the low oil level. The Mercoid switch was cleaned and several operation cycles were observed before the unit was returned to service.

D

7/12 – 0.0 days – Y

The unit was taken off line to perform additional cleaning of the Mercoid switch involved with Outage C directly above. The cleaning was performed and the unit returned to service.

PSNH noted that issues with the Mercoid switches help set the priority of Mercoid switch replacement and that Hooksett has moved up on the switch replacement list.

E
8/26 – 4.4 days – Y
This planned five-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. PSNH conducted the outage on straight time and did not place the unit in service overnight.

Jackman

There were no major planned projects completed at Jackman in 2013.

Jackman-1

A
10/28 – 8.3 days – N
This planned twelve-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. Additional work included the replacement of two penstock saddles. PSNH conducted the outage on straight time and did not place the unit in service overnight.

B
11/16 – 0.0 days – N
The unit tripped on overspeed while testing was being done on the RPM (Revolutions per Minute) meter for replacement design purposes. PSNH states that while the RPM meter was shown on the print, no interconnection to the overspeed circuitry was shown and the technicians believed that the meter was an output only meter.

The unit was reset and put back into service. PSNH also made notations as to the function of the RPM meter.

C
11/7 – 0.2 days – N
Dispatchers noted that the unit's MVAr was fluctuating erratically and suddenly rose up and the unit tripped. PSNH investigation found the cause to be inconsistent operation of the voltage regulator.

PSNH noted that programming of the voltage regulator had been modified to reduce the frequency of unit trips and that the voltage regulator replacement process had begun. PSNH had a replacement unit on site and scheduled replacement for 2014. Engineering for the project had not yet been done.

The unit trips below occurred during operation or during testing of the original voltage regulator.

D
11/12 – 0.1 days – N
The unit tripped due to high field current while in operation.

E
11/2 – 0.7 days – N
The unit tripped due to high field current while in operation.

F
11/13 – 0.0 days – N
The unit tripped due to high field current while in operation. Testing was in progress.

G
11/15 – 0.0 days – N
The unit tripped due to high field current while in operation. Testing was in progress.

H
11/15 – 0.0 days – N
The unit tripped due to high field current while in operation. Testing was in progress.

I
11/16 – 0.1 days – N
The unit tripped due to high field current while in operation.

J
11/18 – 0.9 days – N
The unit tripped due to high field current while in operation.

K
11/19 – 1.0 day – N
The unit tripped due to high field current while in operation.

L
11/26 – 0.0 days – N
The unit tripped due to high field current while in operation.

M
11/27 – 0.1 days – N
The unit tripped due to high field current while in operation. Testing was in progress.

N
11/27 – 0.0 days – N
The unit tripped due to high field current while in operation. Testing was in progress.

O
11/27 – 0.0 days N
The unit tripped due to high field current while in operation. Testing was in progress.

P
12/1 - 0.1 days - N
The unit tripped due to high field current while in operation. PSNH fine-tuned the voltage regulator on this date and the unit returned to service. The situation stabilized with this final adjustment of the original voltage regulator.

Smith

There were no major planned projects completed at Smith in 2013.

Smith-1

A - (Related to a T&D event)
2/5 – 0.4 days – Y
The unit was scheduled out of service so that scheduled transmission work at the Berlin substation related to the Burgess power plant could be completed. When connections were made, the unit returned to service.

B - (Related to a T&D event)
3/27 – 1.2 days – Y
At this time, the 115kV output of Smith hydro was connected to the transmission system via the S-136 115kV line. A scheduled transmission outage for the S-136 115kV line was required the outage of Smith station. The work was completed and the unit returned to service.

C
9/16 – 13.3 days – Y
This planned fourteen-day outage was taken to perform the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. PSNH conducted the outage on straight time with limited over time and did not place the unit in service overnight.

In addition, this outage allowed for the commissioning of the new Z-177kV breaker which ties Smith hydro to the Berlin substation which extended the planned outage by 3 days.

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D – (Related to a T&D event)

10/7 – 0.0 days – Y

This outage is the outage of the X-178 115kV line that caused an interruption to entire North Country. Please see Canaan Outage M.

Evaluation for Hydro Unit Outages Except for Derate Outage Amoskeag S-E and Outages Amoskeag 2-F, Eastman 1-C, Garvins S-B, S-D, and 4-C (Part), and Gorham S-A.

Accion Group reviewed these outages and found them either to be reasonable and expected for these units and their vintage, or necessary for proper operation of the units. Accion Group concluded that PSNH conducted proper management oversight in the operation of these units.

Outage Derate Amoskeag S-E

Accion notes that this outage overlaps two reporting years. The vast majority of the outage time occurred in 2014, so according to the convention developed; this outage will be addressed in 2014.

Outage Amoskeag 2-F

The unit tripped due to a signal from a transducer in the inflatable flash board's logic circuit. When the transducer activated, it went to the high water maximum position which caused the automatic deflation of the flashboards. As the pond level decreased, the pond level control system backed down the unit and eventually shut it down. The ESCC believed that the unit was taken off line due to the pond level control and did not inform hydro personnel of the shutdown. No alarms are transmitted to the ESCC for normal pond control operation or deflation of the inflatable flashboards.

PSNH found that the transducer did not fail but produced an inaccurate signal. The inflatable flashboards were raised in the manual mode, pond level was rebuilt, the transducer was replaced, and the unit returned to service.

The ESCC has flow data available to it and should have recognized at the time that flows of approximately 2,250 cfs would not have resulted in an orderly shutdown of the unit due to pond flow control operation. Accion attributes this outage due to operator inattention. Accion therefore recommends that replacement power costs for this outage not be recovered from customers.

Eastman Falls Outage 1-C

The unit tripped on reverse power. The dispatcher at the ESCC reported that upon starting the unit, it ramped up to full load. The dispatcher reported sending 23 lower output pulses to the unit and it did not respond. After 30 minutes, the dispatcher sent an additional 3 lower pulses to the unit. A hydro operator at the station placed the unit in manual, sent multiple pulses to the unit in both the up and down direction, found the unit responded correctly, and returned the unit to service.

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PSNH investigation found that the incident was due to dispatcher inattention at the ESCC. This matter has been addressed as part of dispatcher training. Accion therefore recommends that replacement power costs for this outage not be recovered from customers.

Outages Garvins S-B, S-D, and 4-C (Part)

Outage Garvins S-B

A station outage was taken to assure that oil from the G4 sump pump pit did not get dispersed. PSNH investigation found that the float switch for the G4 sump pump failed to operate resulting in the oil intrusion. A minor amount of oil was found in the sump pump line that had entered the tailrace. Absorbent booms were deployed and no additional oil was evident by morning. PSNH determined that the sump pump line had not been flushed as required by procedure.

PSNH procedures require that the line from the sump pump to the tailrace be flushed when cleaning oil intrusion into the sump area. This procedure was not followed. Accion therefore recommends that replacement power costs for this outage not be recovered from customers.

Outage Garvins S-D and 4-C (Part)

The unit was in reserve shutdown and was taken out of service due to the failure of the sump pump in the outer shifting ring area. The sump pump failure resulted in water rising in this area to a point where it entered the lower guide bearing oil reservoir which ultimately overfilled. The over fill entered a second sump area which is designed to trap water from the main shaft seal for the unit. That sump pumped a small amount of the oil/water mixture into the draft tube resulting in a minor oil sheen on the water.

A contractor cleaned up the oil sheen, the sump pump was replaced, and the station returned to service. Upon starting the unit, another oil sheen resulted due to residual oil that was in the draft tube. It was the second oil sheen that resulted in the station outage, Outage S-D above. PSNH found that an oil line to the draft tube had not been flushed.

PSNH procedures require that the line from the sump pump to the draft tube be flushed when cleaning oil intrusion into the sump area. This procedure was not followed. Accion therefore recommends that replacement power costs for this part of Outage 4-C and Outage S-D not be recovered from customers.

Outage Gorham S-A

The TB-47 115/22kV transformer differential operated at the Berlin substation. Units #1, #2, and #3 at Gorham tripped due to overvoltage conditions. The system was returned to operational status and the units returned to service.

PSNH investigation as to the reason for the unit trips is not complete. Accion therefore recommends that this outage be considered in the 2014 SCRC review.

Exhibit MDC-7   Combustion Turbine Outages for 2013

Combustion Turbine Outages For 2013

The following outages took place at PSNH's combustion turbine ("CT") units during 2013.

Lost Nation

There was no major work completed at Lost Nation CT-1 during 2013.

Lost Nation – CT-1

A
7/3– 0.1 days
The unit was requested to run by the Independent System Operator – New England ("ISO-NE") when it failed to start. Investigation found that the fuel suction line foot valve for the diesel start engine allowed air to be introduced into the diesel starter fuel system, causing the failure to start. The ISO-NE had last requested the unit to run on 5/16 and no problems were noted at that time. PSNH suspects that the length of time between runs is the cause for the loss of prime in the diesel starter's fuel system. The alarm was reset and the unit was started in the crank position (allowing the start of the diesel starter, engagement of the clutch, and spinning of the CT without firing) without incident and returned to service.

PSNH now starts the diesel starter on a periodic basis to ensure this fuel problem does not occur in the future.

B
8/10 – 0.2 days
The unit was taken off line to investigate a vibration alarm during the previous run. PSNH trouble shot the circuitry associated with the vibration monitoring system and found that a push on terminal on one of the input cards had oxidized. The terminals were cleaned and tightened and the unit was returned to service after a test run.

C
9/13 – 0.1 days
The unit tripped off line due to a high exhaust temperature. PSNH investigation found that one of the exhaust temperature thermocouples showed a spike in its output compared to other exhaust thermocouples. PSNH resolved the issue by rejecting the output of that thermocouple when calculating the exhaust temperature average. The unit was returned to service after a test run which successfully monitored all remaining thermocouples.

D – (Related to a T&D event)
9/24 – 0.0 days
The TB-33 115/34.5kV transformer tripped at Lost Nation due to a 115kV bus fault at East Side 115kV substation in Berlin with the D-142 115kV line from Lost Nation to Whitefield out of service and the Smith hydro Z-177 115kV line temporarily tapped onto the S-136 115kV line between Whitefield and East Side substation to facilitate the interconnection of the Burgess biomass-fired power plant.

With the D-142 115kV line out of service, the Lost Nation Jet was connected to the Berlin 115kV substation.

A transmission contractor attached a fused jumper while conducting relay testing to verify the integrity of the Z-177 115kV tripping logic. The jumper fell off and made contact with another terminal causing the S-136 115kV breaker to trip and lockout. The subsequent outage caused the outage of Canaan hydro (Outage CAN-1-L), the outage of Lost Nation CT-1 (Outage Lost Nation CT-1-D), and would have caused the outage of Smith Hydro but for the fact it was on annual overhaul at the time.

PSNH does not have formal procedures when working in substations that are out of normal configuration. In addition, PSNH was not able to provide contractor tail gate instructions because the information is only retained for 30 days.

E
10/7 – 4.2 days
This scheduled five-day outage was taken to perform the annual maintenance/inspection overhaul. The work performed included a visual inspection, general cleaning, annual equipment tests, servicing the diesel starter engine (Only PSNH CT with this type of starter), and testing of the speed sensors. Testing and inspections revealed no abnormalities.

White Lake

There was no major work completed at White Lake CT-1 during 2013.

White Lake – CT-1

A
1/24 – 0.0 days
The unit tripped upon failure of the motherboard in the unit's computer. The board was replaced and the unit returned to service.

The failed board was repaired and returned to spare stock.

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B
5/6 – 4.3 days
This scheduled five day outage was taken to perform the annual maintenance and inspection overhaul. The work performed included a visual inspection, general cleaning, annual equipment tests, and servicing the diesel starter engine. Testing and inspections revealed no abnormalities.

Schiller

There were no major projects scheduled at Schiller CT-1 during 2013.

Schiller - CT-1

A
1/25 – 0.5 days
During his rounds, an operator noticed oil on the floor of the generator enclosure. The unit was on stand-by so PSNH took an outage to investigate the issue. PSNH found that the bearing lube oil tank level was low, and that the low oil level should have caused a low bearing oil tank alarm which it did not.

PSNH could not find the source of the oil leak but suspected the leak may have come from the inboard side of the generator bearing. This equipment was placed on a more extensive monitoring list.

With regard to the failed alarm, PSNH investigation found that the mercury bottle located within the Merciod switch was loose. Repairs were made and the functionality of the switch was verified.

B
8/27 – 0.0 days
This outage was taken while the unit was in reserve status to perform the annual ISO-NE black start test. The test requires that the unit be out of service. The test was conducted, the unit passed, and the unit returned to service.

C
10/1 – 7.3 days
This scheduled five-day outage was taken to perform the annual maintenance and inspection overhaul. The work performed included a visual inspection, general cleaning, annual equipment tests, and servicing the engine. Testing and inspections revealed no abnormalities.

PSNH also performed the ten-year fuel oil tank inspections which require the draining and cleaning of the fuel tanks. This work was the critical path work for the outage.

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D

12/12 – 0.2 days

The unit was called to run by the ISO-NE. Shortly after phasing the unit, the MW output started to swing. The operator placed the unit in manual control but that effort did not stop the MW output swing. The unit was removed from service.

PSNH contacted the CT's support vendor who made recommendations of items PSNH should check and scheduled a support visit. In the interim, PSNH found a wire that was missing a piece of insulation. PSNH suspected the cause was a pinch by the tray assembly wheel that can be pulled out to allow for work access. PSNH repaired and secured the wire at several locations, canceled the support vendor visit, and returned the unit to service. PSNH was unsure if the wire issue was the cause of the MW output swing.

In addition the importance of securing loose wiring was reinforced with instrument and control and electrical personnel.

E

12/17 – 14.5 days

The unit was called to operate on 12/14. At that time the operator noticed a drop in load and quickly corrected the load level. The issue was monitored, but did not occur again. This issue appeared to be similar to the issue encountered on 12/12 so PSNH called the unit support vendor and scheduled a visit for 12/17.

On 12/17, a visual inspection was made with no abnormalities found. The unit was taken out of service to provide for a more detailed investigation. After the investigation, the support vendor made recommendations for small adjustments, but none of the adjustments would account for the erratic operation of the unit. It was decided to do a test run of the unit.

The start was initiated on automatic and the unit was brought up to normal speed. All parameters including phase angle indication appeared to be okay: however the breaker would not close. The syncroscope was put into the manual position, the voltmeter handle was in the phase 2-3 position (normal position), and the breaker was closed. PSNH states that the Shift Supervisor verified that the voltmeters showed matching voltages, indicating lamps were showing a valid close condition and the syncroscope needle was in the 12 O'clock position. The Shift Supervisor assumed that the speed condition was met during the attempt to phase in the automatic mode which accounted for the speed needle resting in the 12 0'clock position.

Approximately 30 seconds or less after phasing, CT-1 tripped and Schiller-5 lost power to the wood yard and the wood boiler building. Ultimately, Schiller-5 tripped due to the loss of steam. (The Schiller-5 outage is discussed in Outage SCH-5-H.)

PSNH found that the phase 1 bus potential transformer fuse had blown. This finding explains why the unit would not phase when requested to do so in the automatic mode because there was an actual phase difference between both sides of the syncroscope. PSNH confirmed that manual closure could take place when the unit was out of phase because the syncroscope is not supervised by a sync check relay (or synchronizer as shown on the prints) when in the manual mode per the original design.

Testing of the unit took place on 12/19 where the generator stator tested okay, but the generator rotor indicated that it was grounded. PSNH decided to pull the generator rotor and found that both generator poles were blown (shorted) and the rotor had winding, insulation, retaining ring, and blocking damage in this area. The rotor was sent to the original equipment manufacturer (OEM). Further testing by the OEM found that weak resistance to ground existed in the rotor, most likely due to end-of-life aged insulation, excessive carbon and metal particle buildup, or other breaks in ground wall insulation. The OEM stated that these deficiencies could cause a more catastrophic ground failure at any time. PSNH decided to rewind the rotor at this time.

During the rotor outage, PSNH also replaced the unit controls with a design similar to that installed on the Merrimack CTs in 2014. With the problems experienced at Merrimack, PSNH decided to replace the controls of these three units as a package.

Merrimack

There were no major projects scheduled at Merrimack CT-1 or CT-2 during 2013.

Merrimack CT-1

A
1/13 – 1.1 days
The unit tripped and could not be restarted. PSNH investigation found that the K-13 relay had failed. The K-13 relay receives information that the generator bearing lube pressure is satisfactory, and also sends the signal which starts the fuel pump to the engine. PSNH investigation found that the relay coil that sends the signal to the fuel pump had failed and that the fuel pump did not start preventing the unit restart.

The relay coil was replaced and the unit returned to service.

Note: This relay was eliminated when the control system was replaced in 2014.

B
4/15 – 2.6 days
This scheduled five-day outage was taken to perform the annual maintenance/inspection overhaul. The work performed included a visual inspection, general cleaning, and annual equipment tests. Testing and inspections revealed no abnormalities.

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C

5/10 – 0.3 days

The combustion turbines at Merrimack station have two sources of station service. The normal and primary source is from the plant and the secondary source is from the 115kV high yard. If the normal station service is lost, station service is automatically switched to the high yard source. PSNH was experiencing problems with the transfer switch and had planned to replace it during the annual maintenance outage in Outage 1-B, above. Parts were ordered but not received by the need date of 3/15. Parts did not arrive until after the annual outage. Also, the manufacturer's representative was required for installation and had to be scheduled. PSNH took the instant outage while the unit was in reserve status to replace the switch.

D

5/11 – 0.0 days

The unit was in reserve status when the breaker to the station battery charger and inverter tripped. PSNH investigated the cause but could not find anything unusual. The breaker was reset and it held. The unit was returned to reserve status.

E

5/11 – 0.1 days

While in reserve status, the unit tripped identically as in the manner in Outage 1-D above, however, PSNH could not reset the breaker this time. The breaker was disassembled, cleaned, and functioned properly when tested. The unit was returned to reserve status.

F

5/21 – 0.1 days

The unit was called upon to run, but it would not start. PSNH found that the air start gas valve had failed to open when requested. To start this combustion turbine, a 500 psi blast of air is used to start the engine when the air start gas valve opens. The air start gas valve is supervised by a positioner valve that is operated at 20 psi through a regulator connected to the 500 psi system telling the start valve when to open. PSNH found that the 20 psi positioner valve had gummed up with oil residue. (Accion notes that when air pressure is reduced through a regulator, the gas temperature is also reduced; however the hotter 500 psi air has a lower viscosity which drags oil residue with it) The regulator was disassembled and cleaned. When work was completed, the unit returned to service.

Note: PSNH added an oil cooler and oil filter to the air start gas valve system in 2014 as a permanent fix to the problem. Please see Outage 1-K, below.

G

6/3 – 0.0 days

The unit was in reserve status when a high generator stator winding temperature alarm was received via operation of the high generator stator winding temperature switch. The

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generator stator temperature is monitored by 6 remote temperature devices. Activation by any one of these remote devices prevents the generator from starting.

Trouble shooting of the system produced no cause for the switch operation. PSNH believed that a high temperature condition did not exist in the stator winding, successively reset the high temperature switch, and returned the unit to service.

H
7/23 – 0.3 days
The unit was in reserve status when a routine inspection found the generator lube oil belt was in poor condition. This outage was taken to replace the belt. When work was completed, the unit returned to service.

I
7/31 – 0.6 days
The unit was called upon to run but failed to start due to an incomplete start sequence. The incomplete start sequence is a general annunciator alarm for almost anything that prevents the unit from starting and is an old electromechanical device. PSNH found an open coil on the K-15 relay. The K-15 relay, when operated opens fuel flow to the engine. The open coil on the K-15 relay prevented fuel oil to flow to the engine, and thus prevented the engine from starting.

The coil was replaced, the relay tested okay, and the unit returned to service.

J
8/8 – 0.0 days
The unit was in reserve status when an operator found a small fuel drip at one of the fuel filters. The operator was unable to halt the fuel drip by tightening fittings. PSNH took the unit out of service and found that the leak was attributed to a specific fitting. The fitting was replaced and the unit was returned to service.

K
9/6 – 0.0 days
The ISO-NE called for the unit to run to make its Claimed 10 audit and it did not start. (In a Claimed 10 audit, the unit must be able to meet 10 minute claimed output without previous warning from the ISO-NE.) The unit failed its test. PSNH found that the same 20 psi regulator that was cleaned in Outage 1-F, above was again gummed up with oil.

The regulator was replaced, tested okay, and the unit returned to service. When the ISO-NE performed a recall Claimed 10 audit, the unit passed.

Note: PSNH added an after cooler and an improved oil filter to the starting air compressor system during the 2014 annual maintenance outage.

L

9/13 – 0.2 days

While the unit was in reserve status, PSNH took this outage to perform the required NPCC 5-year relay testing while Merrimack Unit #2 was in annual overhaul. The testing was performed and the unit returned to service. Please also see the similar outage for CT-2 in Outage 2-F, below.

M

11/24 – 0.0 days

The unit was in reserve status and was called upon to run. The unit failed to start on an incomplete starting sequence. PSNH investigation found that an air line had frozen preventing the unit from starting even though a heater was local to this area.

Each combustion turbine has an air compressor that can start either unit through valving changes. At the time, PSNH was working on the air compressor for this unit and had valved in the ability to use the Unit #2 start capability, if required. When the Unit #1 compressor was tagged out of service, the heater local to the frozen airline was also taken out of service. PSNH recognized this condition, but had not expected a cold snap severe enough to cause a subsequent line freeze to happen based on projected weather forecasts.

PSNH brought in temporary heaters to thaw the frozen airline, thawed the airline, and returned the unit to reserve status. In addition, PSNH put a requirement in its procedures that when either compressor is isolated in cold conditions, there is an added heat requirement.

Note: PSNH control system modifications made during 2014 included the separation of the heater circuit from the power supply so that future compressor isolations will not include this heater.

N

12/26 – 0.0 days

The unit was called upon to run and it failed to start on an incomplete starting sequence. PSNH investigation could find no reason for the failed start. PSNH retried to start the unit and it started without incident and the unit was returned to in-service operation.

O

12/27 – 0.0 days

The unit was again called upon to run and it failed to start on an incomplete starting sequence. PSNH investigation could find no reason for the failed start. PSNH retried to start the unit and it started without incident and was returned to service.

Note: In 2014, the control systems of CT-1 and CT-2 were completely replaced eliminating many of the electro-mechanical relay operations causing outages. With the problems

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experienced at Merrimack, PSNH decided to replace the controls of these two units plus the Schiller CT as a package.

Merrimack CT-2

A
4/16 – 2.4 days
This scheduled five-day outage was taken to perform the annual maintenance and inspection overhaul. The work performed included a visual inspection, general cleaning, and annual equipment tests. Testing and inspections revealed no abnormalities.

B
4/19 – 0.0 days
Coming back to service from the annual overhaul (Outage 2-A, above), PSNH experienced a problem with the fine tuning of the fuel system valve. In the starting sequence, this valve controls the amount of fuel being supplied to the jet. In this startup, the jet speed was not in range for the fuel input at the 600 rpm set point. The fuel system valve was recalibrated, found to be within tolerances, and the unit was returned to service.

C
4/25 – 0.1 days
The unit was not operating, but available for operation. During the outage taken in Outage 2-B, above, PSNH had also experienced problems with the air starting system at the initial operating point. PSNH investigation found a defective diaphragm on the air starting valve. The diaphragm was replaced; the unit was started without incident, and returned to service.

D
9/6 – 0.0 days
The unit was not in operation and was called to operate by the ISO-NE to conduct the unit's Claimed 10 audit. The unit failed its audit because the 20 psi regulator valve that controls the air start valve was out of adjustment. The regulator valve was adjusted successively and the unit was returned to service.

E
9/10 – 0.0 days
The ISO-NE called again for the unit to start to meet its Claimed 10 audit as a retest. The unit again failed to meet its requirements. PSNH investigation found that the air pressure regulator was again out of adjustment after having been recalibrated 4 days prior. The regulator was replaced, successively tested, and the unit returned to reserve status.

The unit passed its Claimed 10 audit when subsequently requested by the ISO-NE.

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F

9/13 – 0.2 days

The unit was not operating and took this outage to perform required NPCC 5-year relay testing while Merrimack Unit #2 was in annual overhaul. The testing was performed and the unit returned to service. Please also see the similar outage for CT-1 in Outage 1-L, above.

G

12/19 – 0.0 days

Both combustion turbine units were running. CT-1 was requested to shut down and it did so. While CT-1 was shutting down, CT-2 tripped on high/low fuel pressure. Both CT-1 and CT-2 share a common fuel input system. PSNH investigation could not find a reason for the fuel pressure swing. The unit was placed back into service in reserve status.

Evaluation for Combustion Turbine Outages Except for Outages LN-CT-1-D and Canaan 1-L

Accion Group reviewed the outages above, and found them either to be reasonable and not unexpected for these units and their vintage, or necessary for proper operation of the unit. Accion Group concluded that PSNH conducted proper management oversight during these outages.

Outages LN-CT-1-D and Canaan 1-L

These outages occurred when a transmission substation contractor was working in the East Side substation. A fused jumper fell off of a relay terminal during relay testing and came into contact with another terminal.

Accion is not able to determine if these outages are simply employee error, utilization of a jumper that was too short for the job at hand, or unawareness of the due care required when working in substations that are out of normal configuration.

Accion recommends that PSNH review the protocol under which transmission work is done in substations that can impact PSNH generation and ensure that tailgate instructions include proper precautionary measures are taken when potential generation trip conditions are identified.

Accion is not recommending disallowance of replacement power costs for these outages.

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Exhibit MDC-8 W. F. Wyman – 4 Outages for 2013

W. F. Wyman 4 Outages For 2013

W. F. Wyman Station – Unit #4

The W. F. Wyman Station is a generating station that sells power into the New England market. PSNH owns an approximate 3 percent interest in the Wyman Unit #4. NextEra Energy Resources (NextEra) is the majority owner of the unit and, as such, is responsible for day-to-day operations. As a minority owner, PSNH is aware of how the plant conducts business, but has little influence over day-to-day operations of the plant. Accion Group makes this distinction because it believes that the fact that PSNH is a minority owner results in a different evaluation of prudence than would be applied to wholly owned units providing energy to PSNH customers. Wyman Unit #4 is a high cost oil unit operating under tight environmental restrictions and at an annual capacity factor of less than 5%.

Attention to safety and environmental compliance is one indicator of good operational performance. Wyman had no Lost Time Accidents (LTA) in 2013 extending its no-LTA safety record. In addition, Wyman experienced no air or water permit violations in 2013. The unit operated at a capacity factor of 3.1% and an availability of 88.9% in 2013.

The major project performed at Wyman 4 in 2013 was the cleaning and repair of the electrostatic precipitator performed during the annual overhaul described in Outage I, below.

W. F. Wyman 4

A
1/1 – 0.4 days
Trouble shooting found a burnt-out resistor in the circuit that transfers relay control from manual to automatic in one of the voltage regulator circuit boards. A similar incident occurred in 2012 without a resolution. The circuit board was replaced, the issue was corrected, and the unit returned to service.

B
1/3 – 0.2 days
When bringing the unit on-line, the unit tripped on a master fuel trip of the boiler. When coming on-line, three fuel guns are sequentially placed in service. When the fourth gun is placed into service, it hits (bumps) a limit switch indicating that the sequence is complete. Investigation found that the limit switch did not operate and the boiler was subsequently tripped.

The limit switch was found to be gummed up. The switch was cleaned and the unit was put into service. In addition, further investigation found that there was not a preventative maintenance item to clean the limit switch and that the switch had not been cleaned since the unit began commercial operation in 1977. NextEra added a preventative maintenance item to annually clean and inspect all of the burner limit switches. The work will be done outside of the annual overhaul.

C
1/3 – 0.4 days
While putting the unit on-line from Outage B, above, the generator air operated breaker opened with a pole disagreement annunciation (all three poles not in the same open or closed position). The repair crew was in the process of cycling the breaker when moisture was noticed in the breaker's air exhaust and the air receiver tank drain valve was found to be frozen. The breaker was cleaned, exercised, and operation was found to be improved. The breaker was returned to service.

Further investigation found that seal temperature on the breaker actuator was 0^{o}F. The actuator heater is supposed to operate when the temperature is 35^{o}F. The heater control terminals were found to be reversed. The terminal wiring was corrected and the unit was placed back into service. The heater controls were installed in 1977 when the unit began commercial operation.

It was determined that the pilot valve actuator and seal heater was coming on at 0^{o}F rather than 35^{o}F because of the wiring deficiency. Station personnel were not able to determine why this problem had not previously occurred.

D
1/29 – 0.9 days
The unit was running at reduced load prior to this outage. The metal seal membrane on the high pressure feed water heater manway developed a leak and was removed from service. The leak area was ground, welded, and the unit was returned to on line status.

E
4/1 – 4.0 days
The unit remained on line since returning to service from Outage 4-D, above. The leak in the metal seal membrane on the high pressure feed water heater manway discussed in Outage D, above, reoccurred. During this outage, which was taken prior to summer operation, the faulty membrane materials were cut out and replaced as a permanent repair. The unit was returned to service after the work was complete.

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F

6/24 – 0.4 days

The SF_6 (Sulphur Hexafluoride gas) generator breaker located in the high yard tripped on a low air pressure alarm. Investigation found that a proper signal was sent from the breaker to the high yard transmitter to the control room. The control room receiver transducer did not receive the proper signal because the control room receiver was not properly receiving the pressure alarm from the breaker.

Investigation found that the gas pressure at the SF_6 breaker was in fact low. Leak checks were performed, however, no leaks were found. Wyman added an SF_6 local gas pressure check to its operator rounds.

The unit was returned to service, but the issue at the control room receiver has yet to be resolved. Wyman continues its investigation.

Note: Subsequent investigation and actions in 2014 resolved the control room receiver issue.

G

8/7 – 4.9 days

The unit was taken out of service to perform a high pressure wash of the superheater reheater and the economizer sections of the boiler. The wash was performed prior to the summer audit test to maximize the higher output resulting from more efficient operation. The wash was also required for the winter reliability program.

The wash was performed and the unit returned to service.

H

8/29 – 0.5

During his rounds, an operator found a low oil level indication at the generator step-up transformer conservator tank (oil reservoir and expansion tank) gauge and had the unit taken out of service.

The generator step-up transformer was replaced five years ago. Investigation found that a screw on the oil level gauge had backed out preventing a proper oil level indication. In actuality, the oil level in the conservator tank was proper. The oil level gauge was repaired and the unit was returned to service.

Wyman has been unable to determine the reason that the screw backed off of its original position.

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I (Outage Report OR-2013-07)
11/1 – 28.3 days
This outage was taken to perform the annual overhaul of the unit. The outage had an ISO-NE window of 26 days and was internally scheduled for completion in 26 days. The critical path throughout the outage was the cleaning and repair of the electrostatic precipitator. In addition, FERC/NERC relay tests, a full generator inspection, and repairs to the superheater header were performed.

During the inspection, no major unit emergent work was identified. The scheduled outage was completed on schedule.

J
11/29 – 0.2 days
After completing the major overhaul work in Outage I, above, NextEra was in the process of returning the unit to service. Additional protective relay testing was required before the unit could be returned to service.

After completion of the outage, NPCC relay testing requirements required the testing of the relays which required that the unit be in service to perform said testing.

When testing was performed, the unit returned to service.

Evaluation

Accion Group reviewed the above outages and found them either to be reasonable and not unexpected for this unit and its vintage, or necessary for proper operation of the unit. Accion Group concluded that PSNH conducted proper management oversight with its limited ownership.

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Exhibit MDC-9   Open Stipulation Items from Prior Years

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Open Stipulation Items from the 2012 Review of 2011 Operations

As part of the Stipulation Agreement ("SA") signed at the conclusion of the 2012 review (Docket DE 12-116) of 2011 Energy Service/Stranded Cost Recovery Charge ("ES/SCRC") costs and revenues, Public Service Company of New Hampshire ("PSNH") agreed to perform the actions contained in the following recommendations and report on the progress of each in its May 2013 and subsequent ES/SCRC reconciliation filings.

Recommendation 2012-7 Re: Date of Hydro Station Seasonal Temperature Setting Changes

This item was closed, but PSNH was required to submit the results of its barometric controlled ventilation analysis. Accion had recommended that PSNH review and modify the time of year PSNH changes its hydro stations to summer temperature settings to account for early or late season weather events, or that PSNH eliminate the winter temperature period altogether.

PSNH Action Required

During the spring, particularly when the building ventilation system is not configured for summer operation, outages have occurred due to elevated building temperatures.

PSNH agreed to review the time of year it changes temperature settings to address early or late season temperature changes.

PSNH Action

PSNH readiness for summer ventilation operation of its hydro stations requires manual modifications of ventilation louvers and other equipment. To address this issue, PSNH triggers a discussion that starts on April 15th with hydro personnel that will institute summer building ventilation system requirements if weather conditions demonstrate the need for such action. In addition, PSNH was to consider ventilation control by barometric-controlled dampers to reduce the chance of high-bearing temperature conditions. PSNH analysis concluded that barometric dampers were not a feasible solution to the high building temperature problem.

PSNH stated that only five hydro stations were the focus of the summer building ventilation system program. Those stations are Amoskeag, Ayers Island, Garvins Falls, Jackman, and Smith Hydro. In calendar year 2013, building temperature issues developed at Eastman Falls hydro station, which was not on the summer station ventilation list. Since the building temperature excursions that occurred at Eastman Falls in 2013, that station has been added to the summer building ventilation system program.

Recommendations

Accion recommends that PSNH now include all of its hydro stations in the review of building temperatures related to various bearing temperature alarms and trip set points, and that each station be considered for inclusion in the summer ventilation program.

Accion also recommends that PSNH ensure that its summer ventilation control requirements are in place by May 15th of each year and that they remain in place until October 15th to allow for early/late seasonal temperatures.

<u>Recommendation 2012-10</u> Re: Over-Trips on Lower Voltage System, Coordination Studies, Transient Stability Analysis

Accion noted that PSNH is conducting coordination studies that also require a transient stability analysis. Accion recommended that if the over-trip outages are found to be systemic upon conclusion of the PSNH analyses, that system reliability design incorporates the unit over-trips into system design criteria on a local and by contingency basis only if other economic remedies are not available.

PSNH Action Required

PSNH agreed to perform coordination studies at its smaller stations. PSNH also agreed to acquire the capability to perform in-house transient stability and perform transient stability studies at Canaan and Jackman hydro areas first before proceeding with other generating locations. In addition, PSNH agreed that, subsequent to the completion of these two transient stability analyses, PSNH will identify the most cost-effective next steps to rectify any problems identified. Relative to the extent that systemic issues are identified as associated with over-trip outages, PSNH will determine prudent action on an on-going basis using good engineering judgment.

PSNH Action

PSNH developed recommended relay setting changes at all of its hydro stations, and the two combustions turbines located on the distribution system. All recommended relay setting adjustments were completed by the end of 2013.

In 2012, PSNH also developed the in-house capability to conduct transient stabilities, trained in-house personnel in that expertise, and conducted transient stability studies at Canaan and Jackman stations, the two units viewed most prone to system instability. PSNH modeled both peak and light load conditions, and simulated faults in the area of the study units. The results of those studies generally agree with actual fault scenarios, but not as well as anticipated. The PSNH model included the generator step-up transformer impedance as part of the unit impedance. In the Jackman study, some units were netted with load and not dynamically represented. Accion requested that PSNH verify that the model was conservative as stated by PSNH by rerunning some faults with all step-up transformers represented, all generators represented, and an updated load model that PSNH was currently developing.

PSNH made the adjustments to their analyses as recommended. Results were slightly less conservative. In addition, PSNH did not include the Lost Nation CT in their analysis of the Canaan hydro area. PSNH agreed to revise their Canaan analysis with the Lost Nation CT included. PSNH noted that no overspeed trips were observed in either the Jackman or Canaan analyses. PSNH also noted that there is no reverse power relay at Canaan, and that the reverse power relay at Jackman has a four-second time delay. Subsequent PSNH investigation revealed that out of the 8 time overcurrent trips related to the 357 breaker at Canaan, 6 of them were expected for the faults that occurred on the 355 34.5kV line. The other two were due to mis-coordination resulting from mechanical wear on the relay or instability.

PSNH states that it conducts its 10-year power system analyses assuming no hydro or wind generation in service in addition to the largest local area generator being out of service. PSNH believes that this action allows any potential problems to surface early on in the development of potential area solutions. PSNH reliability guidelines only require the outage of the largest local area generator in determining actual system reliability additions.

Recommendations

PSNH stated that the 357 overcurrent relay will be replaced at Canaan in 2015. PSNH must make specific recommendations on how it plans to rectify any shortcomings discovered in its analyses of the Jackman and Canaan facilities within economic boundaries with the Lost Nation CT included in the analyses.

Accion observes that PSNH can group the remaining low-voltage hydro generators and White Lake CT into 4 study areas. Accion also is aware that there will be system configuration changes by 2017 in some areas of the PSNH system. Accion, therefore, recommends that the remaining 4 system areas be studied and completed during 2015 and 2016, with future anticipated system configurations, and that the results be reported in the subsequent SCRC reconciliation filings in May 2016 and May 2017.

Accion recognizes that PSNH's 10-year system studies are structured to identify system reliability problems at an early date. Accion also believes that performing the remaining analyses with all hydros etc. off-line to determine construction requirements is too conservative an approach because study results will likely require the addition of excess system equipment at an earlier date than is required by PSNH published guidelines. Accion recommends that construction requirements be determined with system studies that utilize PSNH hydro generation at seasonally adjusted values, so that some load relief and reactive support from the existing facilities can be reflected in the budgeted system requirements. In the case where hydro facilities have been both on-line at low values or off at system peak, PSNH should model both conditions to determine system reinforcement requirements.

The company disagrees with Accion's assessment and states that the 4 areas of interest should be studied based on a cost/benefit basis. Accion disagrees. The Accion position is that mis-coordination should not be designed into the system design and that PSNH should first understand what problems they have designed into the system. When those problems are known and understood, then that is the proper time that economics should dictate PSNH remedial actions.

Recommendation 2012-11 **Re: Vegetation Outages along Rights-of-Way**

Accion recommended that PSNH initiate a 5-year distribution vegetation management program that continually addresses danger trees (known as risk trees to PSNH) outside of the rights-of-way as part of its distribution maintenance cycle and that a similar program for the transmission vegetation management cycle also is initiated.

PSNH Action Required

PSNH agreed to conduct a vegetation inspection along the 355 and 355X10 34.5kV circuits connected to the Canaan Hydro Station during the fourth quarter of 2012 in preparation of full right-of-way maintenance in 2013 and a vegetation inspection of the 335/332 34.5kV circuits that are connected to the Hooksett and Garvins Hydro Stations. PSNH transmission further agreed to implement the recently developed transmission vegetation management plan to remove trees from outside the right-of-way when they pose a risk to the line and the easement allows for removal of such trees contingent upon funding and available easements. PSNH will notify the New Hampshire Public Utilities Commission ("NHPUC") of the final budgeted amount and the completion of the project versus the transmission right-of-way maintenance program.

PSNH distribution agreed to complete a circuit by circuit analysis and identify the rights-of-way that contain easements that allow PSNH to address risk trees outside of the right-of-way. PSNH also agreed to continue its full right-of-way clearing program for the duration of the existing Reliability Enhancement Program. PSNH will remove risk trees outside of the right-of-ways when they are identified and the easement allows for removal of such trees. If the easement does not allow removal, a reasonable attempt will be made to contact the property owner for permission to remove the tree.

PSNH Action

PSNH inspected the 355X10 34.5 kV line in 2011 and all hazard trees were removed. The 355 34.5 kV line was patrolled in 2011 and hazard trees were removed in 2012. Additionally, the right-of-way for the 355 34.5 kV line was scheduled to be mowed in 2013. PSNH has incorporated the removal of danger trees in the 355 34.5kV right-of-way with the mowing cycle of that line and will do both jobs in 2015.

PSNH patrolled the 335/332 34.5 kV lines in 2010 and hazard trees were removed in 2011.

PSNH has completed the identification of distribution easements that allow for removal of danger trees that are outside of their right-of-way easements.

PSNH distribution vegetation management tracks all right–of-way costs by acreage. In 2013, 277 hazard trees were removed from the sides of 1,501 acres of distribution rights-of-way (out of a total of 6,557 acres) at a cost of $204,250. PSNH also stated that approximately two-thirds of the trees were very large trees at 12" to 30" DBH.[22] PSNH indicated that additional funds were to be allocated in 2014.

PSNH transmission also agreed to the removal of hazard trees outside of its rights-of-ways if allowed to do so by easement. Transmission vegetation management tracks all costs by line number. Seven Hundred Thousand Dollars ($700,000) was initially included in the proposed 2013 budget request and $600,000 was ultimately approved for New Hampshire transmission rights-of-ways to begin a four-year schedule for hazard tree removal. In 2013, $706,106 was actually spent for the removal of 7,607 hazard trees along 388 side miles[23] of transmission rights-of-way.[24]

PSNH also stated that many of the trees removed along transmission rights-of-ways were of very small diameter and were not required to be chipped or removed.

Recommendation

Accion recommends that PSNH continue to submit the results of its transmission and distribution efforts to remove hazard trees as part of its annual reconciliation filing of ES/SCRC costs and revenues for the next three filings beginning in May 2015. At the end of that time the distribution and transmission systems would have vegetation management cycles completed.

Accion further recommends that Reliability Enhancement Program (REP) funding continue to be made available to remove distribution hazard trees and full distribution right-of-way width clearing as it relates to impacts on generation operation.

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[22] DBH is defined as diameter at breast height which is considered to be 4.5 feet from ground level.

[23] A transmission line can have either 0, 1, or 2 side miles of right-of-way depending on the number of lines in the right-of-way and the line's position in the right of way. For example, a single transmission line in a right-of way would have 2 side miles per mile of line while a transmission line in the middle of a three line right-of-way would have zero side miles of right-of-way per mile of line.

[24] PSNH has 727 miles of transmission right-of-way and therefore 1,454 side miles of transmission right-of-way.

Summary

Recommendation 2012-7: Close if PSNH agrees with Accion recommendations.

Recommendation 2012-10: Remain open, complete analyses, and reporting requirements in subsequent ES/SCRC reconciliation filings as recommended.

Recommendation 2012-11: Remain closed. PSNH to submit transmission and distribution hazard tree removal updates for the 2015-2017 ES/SCRC reconciliation filings. PSNH REP to address continued funding for distribution danger tree removal and distribution full right-of-way clearing during that time period.

Exhibit MDC-10 Data Responses

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Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. STAFF 1-001 | **Page 1 of 4**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael L. Shelnitz

Request:
Reference Michael L. Shelnitz at Bates Stamps 5, lines 11-22. Please supply the detailed explanation of each service and the costs associated with each service supplied to PSNH by NUSCO as ordered by the Commission in DE 13-108.

Response:
In the testimony of Michael Shelnitz, there is an error in the amount of $10.5 million identified for services provided by NUSCO during 2013 (Page 5, line 20.) For 2013, the total affiliate charges from NUSCO to PSNH Generation was $9.3 million. When compiling the data for the testimony, the affiliate charges of $1.3 million that originated from NSTAR Gas & Electric Corporation was incorrectly added to the total NUSCO affiliate charges of $9.3M that was charged to PSNH Generation. The $9.3M was inclusive of the NSTAR Gas & Electric Corporation affiliate charges. The reconciliation includes the correct amount of $9.3 million.

Please see attachment Staff 1-001 Pg 2 for the transactions, and Pg 3 for the detailed explanation.

Public Service Company of New Hampshire
Docket DE 14-120 Annual Reconciliation of Energy Service and Stranded Cost for 2013
Transactions

Activity	LEGACY NUSCO	NSTAR Gas & Electric Corp.
Accounting	1,741,852	67,495
Communications & Media Relations	130,180	126,863
Corporate Secretary & Board	183,826	-
Corporate Strategy	65,372	-
Energy Supply	999,941	-
Financial Planning	934,959	107,470
General Counsel	950,594	134,217
General Service Co. Overheads	383,679	150,075
General System Management	459,199	442,550
Government Affairs	28,377	-
Human Resources	390,638	81,624
Information Technology	1,466,550	130,446
Investor Relations	92,661	19,197
Miscellaneous[1]	53,280	37,322
Operations Services	16,626	-
Rates & Revenue Requirements	16,285	-
Regulatory Affairs	6,300	-
Safety	45,535	-
Total	7,965,854	1,297,258
Grand Total	9,263,111	

[1]Miscellaneous includes items such as other taxes and office supplies.

Public Service Company of New Hampshire
Docket DE 14-120 Annual Reconciliation of Energy Service and Stranded Cost for 2013
Detailed Explanation

1. Accounting: General accounting, customer accounting and related records; depreciation, accounting procedures and practices to improve efficiency; internal auditing, relations with independent auditors and appearances before and requirements of regulatory bodies with respect to accounting matters; and financial and operating reports and other statistical matters and analyses thereof.
2. General Service Co. Overheads: General Service Company Overhead is applicable to NUSCO employees only and includes employee pension costs, the cost of insurance and other employee benefits, payroll taxes, depreciation on NUSCO assets and other NUSCO facility costs.
3. General System Management: Executive, administrative, managerial, coordinating and advisory services, particularly with respect to the formulation and effectuation of policies and programs affecting or relating to the NU System as a whole, including financial, accounting, and economic policies and programs, power supply, public and employee relations, regulation, contractual arrangements, administrative and other proceedings, industry-wide activities and like matters.
4. Communications & Media Relations: Activities involving internal and external communications; messages issued by the NU System to employees, media, and the general public.
5. Corporate Secretary & Board: Policies and practices relating to the performance of corporate secretarial functions and activities, including the preparation and maintenance of official corporate records, reports, minutes and correspondence in accordance with assigned responsibilities and duties.
6. Corporate Strategy: Creation and execution of the major goals of the NU System.
7. Energy Supply: The bulk power supply system from sources of supply through bulk substations; to achieve reliable service at minimum cost, including forecasts of electric loads; power supply arrangements among the NU System companies; power supply relations with other utilities; design, engineering and scheduling of electric production and transmission facilities; the design, engineering and scheduling of major and unusual distribution facilities; the NU System electric load dispatching operations and related matters.
8. Financial Planning: Financial structures; financial programs to raise funds required or to effect savings through re-financing; relations with commercial banks and negotiation of short-term borrowing; relationships with investment bankers, analysts, analyst societies, securities holders, stock exchanges and indenture trustees, transfer agents and registrars; general treasury, banking and financial matters.
9. General Counsel: Responsible for handling legal issues within the NU System.
10. Government Affairs: Works with local, state and federal bodies on issues affecting the NU System.
11. Human Resources: Responsible for personnel sourcing, hiring, development, and associated government compliance.

12. Information Technology: Responsible for handling information systems and equipment; development and maintenance of systems.
13. Investor Relations: Responsible for compliance of securities laws; communicators between the NU System and stakeholders including the financial community.
14. Operations Services: Electric operations, including production, transmission and distribution of electricity; the construction, operation and maintenance of electric facilities; and in general all electric construction, maintenance and operating activities.
15. Rates & Revenue Requirements: Responsible for the financial requirements of the NU System.
16. Regulatory Affairs: Responsible for working with regulatory bodies on issues affecting the NU System.
17. Safety: Responsible for providing safety functions to the NU System.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-003 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference Shelnitz testimony, Attachment MLS-2 (Bates 11). For the planned outages listed on page 9 of Smagula's testimony (Bates 61), please supply the replacement power costs calculated in the same manner for the values in Attachment MLS-2.

Response:
Please see the attached table.

PSNH Replacement Power Costs (RPC)

UNIT	DATES	TYPE	PSNH RPC $
Schiller 6	3/10/13 - 4/10/13	Outage	0
Newington	4/1/13 - 4/12/13	Outage	0
Schiller 5	4/13/13 - 5/3/13	Outage	453,558
Merrimack 2	9/16/13 - 12/7/13	Outage	0
Merrimack 1	10/28/13 - 11/22/13	Outage	0
Total			453,558

Note: The only planned outage resulting in replacement power costs being incurred during the period was the Schiller 5 outage noted above.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-004 **Page 1 of 3**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael L. Shelnitz

Request:
Reference Shelnitz testimony, Attachment MLS-4, page 8 (Bates 21). For Merrimack, Schiller and Newington Station, please provide, by month and fuel type, the monthly per unit delivered fuel costs.

Response:
Please see the attached pages 2 and 3.

Merrimack Station
2013 Monthly Per Unit Delivered Fuel Costs

	Coal Cost/Ton	#2 Oil Cost/Gallon
January	$ 114.90	$ 3.15
February	118.47	4.28
March	111.41	2.29
April	109.45	3.22
May	104.38	3.16
June	105.29	3.24
July	118.81	3.26
August	111.98	3.28
September	110.61	-
October	103.50	-
November	104.19	3.21
December	103.91	3.29

Newington Station
2013 Monthly Per Unit Delivered Fuel Costs

	#2 Oil Cost/Gallon	Gas Cost/MCFs	#6 Oil Cost/Gallon
January	$ 3.21	$ 8.51	$ 2.64
February	3.36	19.36	-
March	3.02	9.82	2.44
April	-	-	-
May	-	8.55	-
June	-	-	-
July	3.21	7.34	-
August	3.12	5.35	2.46
September	3.02	6.15	-
October	-	-	-
November	3.07	16.44	2.58
December	3.14	-	-

Schiller Station
2013 Monthly Per Unit Delivered Fuel Costs

	Coal Cost/Ton	Wood Cost/Ton	Gas Cost/MCFs
January	$ 95.84	$ 30.07	$ 10.59
February	-	30.01	10.17
March	96.44	30.06	12.36
April	-	30.13	10.82
May	-	30.00	7.28
June	87.27	30.07	8.16
July	-	30.06	7.62
August	-	30.03	10.06
September	-	29.91	3.12
October	-	30.04	10.06
November	99.16	30.10	5.72
December	-	30.05	5.75

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-005 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael L. Shelnitz

Request:
Reference Shelnitz testimony, Attachment MLS-4, page 10 (Bates 34), line 4. Please provide a detailed listing, by month, of the items included in the ISO-NE Ancillary costs.

Response:
Please see the attached page 2 of 2.

Public Service Company of New Hampshire
Detail of ISO-NE Ancillary Costs
January 2013 – December 2013
($000s)

	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Total
Account 44770 **(a)**	(29)	(907)	(1,351)	(64)	(268)	(197)	(531)	(1,481)	(282)	(4)	(16)	(435)	(5,565)
Account 5554N **(a)**	118	162	277	97	41	58	192	116	94	80	71	116	1,423
Account 44778 **(b)**	(89)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(6)	(14)	(28)	(13)	(177)
Account 55529 **(b)**	3	-	10	0	0	0	0	1	0	358	1	4	379
Account 57570 ISO Schedule 2 **(c)**	140	175	225	209	195	126	125	145	191	139	120	109	1,900
Account 57571 ISO Schedule 3 **(d)**	85	79	87	85	76	69	72	83	92	78	84	62	951
Account 565LR Load Response **(e)**	4	(2)	21	4	4	(179)	5	27	7	6	3	13	(87)
Fossil Hydro Rental **(f)**	(35)	(34)	(34)	(34)	(47)	(47)	(47)	(22)	(22)	(19)	(18)	(18)	(377)
Smith Hydro PTCs **(g)**	-	-	(31)	-	-	(32)	-	-	(21)	-	-	(16)	(100)
Premium on REC Transfers **(h)**	-	-	(26)	3	-	101	3	-	-	(22)	2	-	61
Garvin Falls **(i)**	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(51)
Total ISO-NE Ancillary Costs	194	(535)	(832)	292	(7)	(108)	(188)	(1,140)	48	598	216	(181)	(1,642)

Amounts shown above may not add due to rounding

(a) Includes miscellaneous ISO charges including but not limited to Regulation, Reserve Market, NCPC - Day Ahead, and NCPC - Real Time.
(b) Includes miscellaneous ISO charges for Auction Revenue Rights (ARR) and Financial Transmission Rights (FTR) activity.
(c) ISO Schedule 2 is the cost of the service provided by ISO for administration of the energy market.
(d) ISO Schedule 3 is the cost of the service provided by ISO for administration of the reliability market.
(e) Load Response includes costs associated with Demand Response programs with retail customers who reduce their electricity consumption during periods of peak demand.
(f) Includes lease revenues related to third party telecommunications installations at the fossil/hydro plants.
(g) Includes the Federal Production Tax Credit related to Smith Hydro.
(h) Includes sale of RECs to Iberdola at a $2 premium, and sales of RECs at a higher price than the NH Alternative Compliance Payment.
(i) Includes the amortization of proceeds from the Garvin Falls sale/lease-back transaction.

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Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-009 **Page 1 of 3**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference Shelnitz testimony, Attachment MLS-4, page 14 (Bates 38), lines 25 – 29. Please provide supporting calculations for each of the fuel price adjustments shown on these lines.

Response:
Pursuant to Puc 203.08(d) and RSA 363:28, VI, PSNH provides this response on a confidential basis to the Commission Staff and the Office of Consumer Advocate. PSNH submits that it has a good faith basis for seeking confidential treatment of the documents in this response and that it intends to submit a motion for confidential treatment of the documents prior to the commencement of any hearing in this proceeding.

The confidential attachment (2 pages) contains the requested information. On Page 2 of 3, the data from MLS-4 lines 25 - 29 is repeated and then broken out into two pieces: 1) Fuel Price Adjustment and 2) Other Adjustments. Page 3 of 3 contains supporting information and notes regarding the Fuel Price Adjustment values from Page 2 of 3. This is a confidential attachment per Order 25,294 in DE 11-184.

REDACTED

REDACTED

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-010 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, (Bates 40, lines 7-8). Please supply a table that depicts the 2013 customer migration PSNH projected for the on-peak and off-peak periods (in MW and MWh) when planning its procurement of supplemental energy supply for its energy customers. As part of your response, also supply in a similar format the actual customer migration that occurred. If there are any significant discrepancies between the two lists of data, please reconcile.

Response:
Please see the attached table. "Planning" figures are those utilized when evaluating the need for supplemental purchases and reflect then current migration levels.

	Actual Migration						Planning Migration					
	Peak		Off-Peak		Total		Peak		Off-Peak		Total	
2013	MW	MWh	MW	MWh	MW	MWh	MW	MWh	MW	MWh	MW	MWh
Jan	520	183,055	389	152,386	451	335,440	488	171,900	372	145,944	427	317,844
Feb	504	161,345	388	136,699	444	298,044	476	152,205	365	128,634	418	280,839
Mar	510	171,404	385	156,832	442	328,236	453	152,339	333	135,807	387	288,147
Apr	521	183,537	386	142,167	452	325,703	449	158,126	309	113,652	377	271,778
May	563	198,186	397	155,502	475	353,688	457	160,740	324	127,128	387	287,868
Jun	611	195,632	465	186,088	530	381,720	523	167,318	363	145,200	434	312,518
Jul	688	242,098	512	200,686	595	442,784	662	232,944	452	177,103	551	410,047
Aug	651	229,143	467	183,049	554	412,192	607	213,569	441	172,926	519	386,495
Sep	609	194,839	446	178,384	518	373,223	561	179,425	393	157,251	468	336,676
Oct	577	212,417	425	159,665	500	372,081	525	193,203	394	147,965	459	341,168
Nov	586	187,586	451	180,896	511	368,482	549	175,832	420	167,977	478	343,809
Dec	588	197,578	466	190,042	521	387,621	601	202,082	454	185,409	521	387,491
Ave. or Total	578	2,356,820	432	2,022,396	500	4,379,216	529	2,159,681	386	1,804,998	453	3,964,680

Notes:
In late March/early April, monthly purchases for April & May were completed.
In early June, monthly purchases for September thru November were completed.
Supplemental purchase guidelines provide for a margin between the total shortfall position and the actual amount purchased.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-011 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, (Bates 41, line 11 through Bates 42, line 2). For the years 2007 through 2013, please list the on-peak purchases and off-peak purchases made by PSNH to furnish supplemental energy to its customers. The list need only contain spot, long-term bilateral or contract annual, bi-lateral monthly or greater, bilateral weekly and daily purchases and should also include total purchases in your response. In a similar format, please supply the sales made by PSNH for the same time period. As part of your response and in the same breakdown as above, please supply the net energy purchases and cost for the years requested.

Response:
PSNH objects to the question to the extent that it requests information outside the scope of the docket. Subject to, and without waiving, this objection, PSNH will provide a response in accordance with the procedural schedule in the docket.

PSNH notes that data for years 2007 thru 2012 is available in PSNH's response to Staff 1-010 in Docket DE 13-108. Please see the attached table for 2013.

2013 Summary of PSNH Purchases and Sales Activity

Peak Purchases

Year	Annual Bilateral		Other Bilateral		Spot Purchases		Total Purchases	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	545,600	25,213	214,833	11,277	760,433	36,490

Off-Peak Purchases

Year	Annual Bilateral		Other Bilateral		Spot Purchases		Total Purchases	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	232,000	9,973	379,433	13,594	611,433	23,567

Total Purchases

Year	Annual Bilateral		Other Bilateral		Spot Purchases		Total Purchases	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	777,600	35,186	594,266	24,871	1,371,866	60,057

Peak Sales

Year	Annual Bilateral		* Other Bilateral		Spot Sales		Total Sales	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	0	0	199,625	17,555	199,625	17,555

Off-Peak Sales

Year	Annual Bilateral		* Other Bilateral		Spot Sales		Total Sales	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	0	0	255,688	19,312	255,688	19,312

Total Sales

Year	Annual Bilateral		* Other Bilateral		Spot Sales		Total Sales	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	0	0	455,313	36,868	455,313	36,868

* In PSNH's database these sales are netted in Other Bilateral purchases shown above, and are included here for information only.

Net Peak Purchases

Year	Annual Bilateral		Other Bilateral		Spot		Net Purchases	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	545,600	25,213	15,208	(6,278)	560,808	18,935

Net Off-Peak Purchases

Year	Annual Bilateral		Other Bilateral		Spot		Net Purchases	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	232,000	9,973	123,745	(5,718)	355,745	4,255

Net Purchases

Year	Annual Bilateral		Other Bilateral		Spot		Net Purchases	
	MWh	$(000)	MWh	$(000)	MWh	$(000)	MWh	$(000)
2013	0	0	777,600	35,186	138,953	(11,996)	916,553	23,189

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-012 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, (Bates 41, lines 1 through 3). For 2013 and by month, please list each bilateral purchase made by PSNH (weekly, monthly, etc.), its duration, and MW/MWh amount.

Response:
Please see the attached table.

2013 - PSNH Bilateral Purchases for Energy

Year	Month	Start Date	End Date	5x16 MWh/Hr	5x16 MWh	2x16 MWh/Hr	2x16 MWh	7x16 MWh/Hr	7x16 MWh
2013	1	1/9/13	1/11/13	100	4,800				
		1/12/13	1/13/13			100	3,200		
	3	3/21/13	3/21/13	200	3,200				
		3/22/13	3/22/13	150	2,400				
		3/23/13	3/24/13			150	4,800		
		3/30/13	3/31/13			100	3,200		
		3/30/13	3/31/13			200	6,400		
	4	4/1/13	4/30/13	100	35,200				
		4/1/13	4/30/13	100	35,200				
		4/1/13	4/5/13	100	8,000				
		4/6/13	4/7/13			100	3,200		
		4/13/13	4/14/13			300	9,600		
		4/15/13	4/15/13	50	800				
		4/20/13	4/21/13			50	1,600		
		4/24/13	4/26/13	100	4,800				
		4/27/13	4/28/13			200	6,400		
	5	5/1/13	5/31/13	100	35,200				
		5/1/13	5/31/13	100	35,200				
		5/4/13	5/5/13			200	6,400		
		5/6/13	5/10/13	100	8,000				
		5/11/13	5/12/13			200	6,400		
		5/18/13	5/19/13			200	6,400		
		5/25/13	5/27/13			150	7,200		
		5/25/13	5/27/13			50	2,400		
	6	6/6/13	6/6/13	250	4,000				
		6/7/13	6/7/13	250	4,000				
		6/10/13	6/10/13	200	3,200				
		6/11/13	6/11/13	200	3,200				
		6/12/13	6/12/13	200	3,200				
		6/13/13	6/14/13	200	6,400				
		6/15/13	6/16/13			150	4,800		
		6/17/13	6/21/13	150	12,000				
		6/22/13	6/23/13			250	8,000		
		6/24/13	6/24/13	250	4,000				
		6/27/13	6/27/13	250	4,000				
		6/28/13	6/28/13	250	4,000				
		6/29/13	6/30/13			200	6,400		
	7	7/1/13	7/1/13	200	3,200				
		7/2/13	7/2/13	200	3,200				
		7/5/13	7/5/13	150	2,400				
		7/5/13	7/5/13	50	800				
		7/6/13	7/7/13			150	4,800		
		7/6/13	7/7/13			50	1,600		
		7/24/13	7/24/13	250	4,000				
		7/25/13	7/26/13	50	1,600				
		7/25/13	7/26/13	200	6,400				
		7/27/13	7/28/13			250	8,000		
		7/29/13	7/29/13	250	4,000				
		7/31/13	7/31/13	150	2,400				
		7/31/13	7/31/13	100	1,600				
	8	8/1/13	8/2/13	250	8,000				
		8/3/13	8/4/13			200	6,400		
		8/3/13	8/4/13			50	1,600		
		8/5/13	8/5/13			200			
		8/6/13	8/6/13	200	3,200				
		8/10/13	8/11/13			200	6,400		
		8/12/13	8/16/13	200	16,000				
		8/17/13	8/18/13			200	6,400		
		8/19/13	8/23/13	200	16,000				
		8/24/13	8/25/13			200	6,400		
		8/26/13	8/26/13	200	3,200				
		8/28/13	8/30/13	200	9,600				
	9	9/1/13	9/30/13					250	120,000
	10	10/1/13	10/31/13					200	99,200
	11	11/1/13	11/30/13					200	96,000
		11/21/13	11/22/13	150	4,800				
	12	12/2/13	12/6/13	200	16,000				
		12/5/13	12/5/13	50	800				
		12/7/13	12/8/13			200	6,400		
	Total				328,000		134,400		315,200

Notes: 5x16 is non-holiday weekdays, hours 8 thru 23.
2x16 is weekend days and holidays, hours 8 thru 23.
7x16 is all days, hours 8 thru 23.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | Date of Response: 08/01/2014
Request No. STAFF 1-013 | Page 1 of 2
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, (Bates 41, lines 1 through 3). By unit (with CTs as a group) and by month, please show the MWh modeled as on economic reserve shutdown and capacity factor. As part of your response, please supply an additional table that shows actual MWh reserve shutdowns and capacity factor. Please include annual totals for each table.

Response:
Please see the attached table.

2013 - Economic Reserve Shutdown MWh and Equivalent Capacity Factor
As Modeled

	Merrimack 1 Economic Reserve Shutdown		Merrimack 2 Economic Reserve Shutdown		Schiller 4 Economic Reserve Shutdown		Schiller 5 Economic Reserve Shutdown		Schiller 6 Economic Reserve Shutdown		Newington Economic Reserve Shutdown		CTs Economic Reserve Shutdown	
2013	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF
Jan	0	0.0%	0	0.0%	15,744	44.1%	0	0.0%	15,934	44.1%	291,346	97.8%	75,791	100.0%
Feb	0	0.0%	0	0.0%	23,808	73.8%	0	0.0%	24,096	73.8%	263,332	97.9%	68,456	100.0%
Mar	44,970	55.9%	137,488	55.9%	34,176	95.7%	0	0.0%	10,493	29.0%	291,346	97.8%	75,791	100.0%
Apr	77,832	100.0%	95,184	40.0%	34,560	100.0%	0	0.0%	1,992	5.7%	198,899	69.0%	73,346	100.0%
May	80,426	100.0%	203,919	82.9%	35,712	100.0%	0	0.0%	36,144	100.0%	297,749	100.0%	75,791	100.0%
Jun	77,760	100.0%	237,600	100.0%	33,440	97.8%	0	0.0%	33,665	97.8%	276,138	95.8%	59,527	100.0%
Jul	43,092	53.6%	131,670	53.6%	33,820	95.7%	0	0.0%	33,283	93.5%	262,531	88.2%	61,512	100.0%
Aug	57,132	71.1%	174,570	71.1%	33,820	95.7%	0	0.0%	34,048	95.7%	268,134	90.1%	61,512	100.0%
Sep	77,760	100.0%	174,240	73.3%	34,200	100.0%	0	0.0%	34,430	100.0%	288,144	100.0%	59,527	100.0%
Oct	31,133	38.7%	0	0.0%	35,712	100.0%	0	0.0%	36,144	100.0%	297,749	100.0%	75,791	100.0%
Nov	19,999	25.7%	100,803	42.4%	34,560	100.0%	0	0.0%	34,978	100.0%	288,144	100.0%	73,346	100.0%
Dec	0	0.0%	0	0.0%	19,584	54.8%	0	0.0%	19,432	53.8%	297,749	100.0%	75,791	100.0%
Total	510,182	53.9%	1,255,926	43.4%	369,270	88.1%	0	0.0%	315,134	74.4%	3,321,260	94.7%	836,178	100.0%

'Modeled' figures are from the Dec, 2012 and June, 2013 ES rate filings.

2013 - Economic Reserve Shutdown MWh and Equivalent Capacity Factor
Actual Results

	Merrimack 1 Economic Reserve Shutdown		Merrimack 2 Economic Reserve Shutdown		Schiller 4 Economic Reserve Shutdown		Schiller 5 Economic Reserve Shutdown		Schiller 6 Economic Reserve Shutdown		Newington Economic Reserve Shutdown		CTs Economic Reserve Shutdown	
2013	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF	MWh	Equiv. CF
Jan	11,351	14.1%	0	0.0%	12,048	33.7%	0	0.0%	12,194	33.7%	251,326	84.4%	74,772	98.7%
Feb	0	0.0%	0	0.0%	8,016	24.9%	0	0.0%	7,190	22.0%	210,905	78.4%	68,456	100.0%
Mar	5,189	6.5%	19,830	8.1%	23,760	66.5%	0	0.0%	7,481	20.7%	282,941	95.0%	75,485	99.6%
Apr	69,076	88.8%	163,928	68.9%	25,968	75.1%	0	0.0%	15,691	44.9%	179,290	62.2%	72,633	99.0%
May	46,591	57.9%	160,293	65.2%	19,296	54.0%	0	0.0%	32,403	89.7%	292,146	98.1%	74,670	98.5%
Jun	56,376	72.5%	178,530	75.1%	31,065	90.8%	0	0.0%	29,744	86.4%	279,340	96.9%	58,453	98.2%
Jul	36,828	45.8%	67,650	27.6%	24,843	70.3%	0	0.0%	27,257	76.6%	243,722	81.9%	59,775	97.2%
Aug	67,500	84.0%	217,470	88.6%	27,978	79.2%	0	0.0%	33,904	95.3%	276,938	93.0%	60,106	97.7%
Sep	73,008	93.9%	107,250	45.1%	32,965	96.4%	0	0.0%	33,044	96.0%	282,941	98.2%	58,039	97.5%
Oct	70,157	87.2%	0	0.0%	35,712	100.0%	0	0.0%	35,075	97.0%	297,749	100.0%	74,670	98.5%
Nov	1,189	1.5%	0	0.0%	24,672	71.4%	0	0.0%	24,922	71.3%	284,942	98.9%	72,531	98.9%
Dec	0	0.0%	5,288	2.2%	8,160	22.8%	0	0.0%	9,036	25.0%	271,336	91.1%	72,021	95.0%
Total	437,345	46.2%	920,638	31.8%	274,752	65.6%	0	0.0%	268,499	63.4%	3,153,576	90.0%	821,287	98.2%

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. STAFF 1-014 | **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, (Bates 43, lines 13-14). Please supply available FCM pricing data for 2014 through 2016.

Response:
PSNH objects to the question to the extent that it requests information outside the scope of the docket. Subject to, and without waiving, this objection, PSNH will provide a response in accordance with the procedural schedule in the docket.

Please see the attached table.

Forward Capacity Market Pricing Data

Year	Month	Forward Capacity Auction Clearing Price $/kW-mo
2014	Jan	2.951
	Feb	2.951
	Mar	2.951
	Apr	2.951
	May	2.951
	Jun	3.209
	Jul	3.209
	Aug	3.209
	Sep	3.209
	Oct	3.209
	Nov	3.209
	Dec	3.209
2015	Jan	3.209
	Feb	3.209
	Mar	3.209
	Apr	3.209
	May	3.209
	Jun	3.434
	Jul	3.434
	Aug	3.434
	Sep	3.434
	Oct	3.434
	Nov	3.434
	Dec	3.434
2016	Jan	3.434
	Feb	3.434
	Mar	3.434
	Apr	3.434
	May	3.434
	Jun	3.150
	Jul	3.150
	Aug	3.150
	Sep	3.150
	Oct	3.150
	Nov	3.150
	Dec	3.150

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-015 **Page 1 of 3**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, (Bates 44, line 18 through Bates 45, line 5). Please supply the numerical value and cost of FTRs in MWs purchased for Newington, Schiller, and Merrimack stations by month for the years 2010 through 2013 inclusive. In addition, please show gross and net congestion savings by month and total for 2013.

Response:
PSNH objects to the question to the extent that it requests information outside the scope of the docket. Subject to, and without waiving, this objection, PSNH will provide a response in accordance with the procedural schedule in the docket.

PSNH notes that data for years 2010 thru 2012 is available in PSNH's response to Staff 1-014 in Docket DE 13-108. Please see the attached tables for 2013.

2013 FTR Activity and Valuation for Merrimack, Schiller, and Newington

Source	Month	FTR MW Quantity Peak	FTR MW Quantity Off-Peak		Corresponding Cost and Value of FTRs (Expense) / Revenue FTR Auction $	FTR Value $	Net FTR $
Merrimack	Jan - Dec	0	0		0	0	0
	Jan	0	0		0	0	0
	Feb	50	95		(748)	(4,099)	(4,847)
	Mar	0	0		0	0	0
	Apr	0	0		0	0	0
	May	0	0		0	0	0
	Jun	8	50		(161)	0	(161)
	Jul	0	0		0	0	0
	Aug	0	0		0	0	0
	Sep	0	0		0	0	0
	Oct	0	0		0	0	0
	Nov	0	0		0	0	0
	Dec	100	100		1,272	(76,522)	(75,250)
				Total	363	(80,621)	(80,259)
Schiller	Jan - Dec	0	0		0	0	0
	Jan	0	0		0	0	0
	Feb	80	40		0	(5,126)	(5,125)
	Mar	40	40		(32)	(381)	(413)
	Apr	0	0		0	0	0
	May	40	40		(152)	(122)	(273)
	Jun	40	40		86	0	86
	Jul	40	40		156	3	160
	Aug	40	40		281	(82)	199
	Sep	0	0		0	0	0
	Oct	8	0		(17)	(0)	(17)
	Nov	40	0		107	577	684
	Dec	120	40		1,663	(50,073)	(48,410)
				Total	2,094	(55,204)	(53,110)
Newington	Jan - Dec	0	0		0	0	0
	Jan	0	0		0	0	0
	Feb	0	0		0	0	0
	Mar	0	0		0	0	0
	Apr	0	0		0	0	0
	May	0	0		0	0	0
	Jun	0	0		0	0	0
	Jul	0	0		0	0	0
	Aug	0	0		0	0	0
	Sep	0	0		0	0	0
	Oct	0	0		0	0	0
	Nov	0	0		0	0	0
	Dec	0	0		0	0	0
				Total	0	0	0
				Total Above	2,457	(135,825)	(133,368)

Notes:
Jan.-Dec. FTR Auction and Value dollars are allocated monthly as per ISO-NE Billing methodology.
FTR Auction $ - this is the amount paid to (-) or received from (+) ISO based on the auction clearing price of awarded FTRs.
FTR Value $ - this is the amount paid to (-) or received from (+) ISO based on the realized value of the awarded FTRs.
Net FTR $ - the sum of the auction dollars and market value of the awarded FTRs.
[FTR Value includes refund of under-funded target allocations via the ISO-NE Congestion Revenue Fund.]

2013 Total FTR Activity and Valuation

Source	Month	FTR MW Quantity Peak	FTR MW Quantity Off-Peak		Corresponding Cost and Value of FTRs (Expense) / Revenue FTR Auction $	FTR Value $	Net FTR $
Other FTRs	Jan - Dec	0	0		0	0	0
(other than MK, SR, NT)	Jan	0	0		0	0	0
	Feb	0	0		0	0	0
	Mar	0	10		(21)	(28)	(49)
	Apr	10	10		168	(63)	105
	May	150	0		(29)	(69)	(98)
	Jun	0	0		0	0	0
	Jul	0	0		0	0	0
	Aug	0	0		0	0	0
	Sep	200	0		9,456	(358,286)	(348,830)
	Oct	200	0		21,390	(840)	20,550
	Nov	75	0		2,040	(4,924)	(2,884)
	Dec	25	25		(6,448)	(18,862)	(25,310)
				Total	26,556	(383,071)	(356,515)

Source	Month	FTR MW Quantity Peak	FTR MW Quantity Off-Peak		FTR Auction $	FTR Value $	Net FTR $
TOTALS for all FTRs	Jan - Dec	0	0		0	0	0
(including those above)	Jan	0	0		0	0	0
	Feb	130	135		(748)	(9,225)	(9,973)
	Mar	40	50		(53)	(409)	(461)
	Apr	10	10		168	(63)	105
	May	190	40		(180)	(191)	(371)
	Jun	48	90		(75)	0	(75)
	Jul	40	40		156	3	160
	Aug	40	40		281	(82)	199
	Sep	200	0		9,456	(358,286)	(348,830)
	Oct	208	0		21,373	(840)	20,533
	Nov	115	0		2,147	(4,347)	(2,200)
	Dec	245	165		(3,513)	(145,457)	(148,971)
				Total	29,013	(518,896)	(489,883)

Notes:
Other FTR MWs include those that were purchased to address MA Hub bilateral, contract, and Bio Energy buyout purchases.
Jan.-Dec. FTR Auction and Value dollars are allocated monthly as per ISO-NE Billing methodology.
FTR Auction $ - this is the amount paid to (-) or received from (+) ISO based on the auction clearing price of awarded FTRs.
FTR Value $ - this is the amount paid to (-) or received from (+) ISO based on the realized value of the awarded FTRs.
Net FTR $ - the sum of the auction dollars and market value of the awarded FTRs.
[FTR Value includes refund of under-funded target allocations via the ISO-NE Congestion Revenue Fund.]

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-016 **Page 1 of 7**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, Attachments FBW-2 and FBW-3 (Bates 49 and 50). Please provide by month for on-peak, off-peak, and total values, and in the form provided in previous SCRC dockets:

a. Information on bilateral purchases and costs, spot purchases and costs, and sales of surplus purchases.
b. Actual bilateral and spot purchase quantities compared to those in the rate request in both tabular and color graphic form.
c. Total supplemental purchases and percent breakdown monthly bilateral, short-term bilateral and spot purchases.
d. Spot sale energy to the ISO-NE and value from PSNH units, from long-term bilateral surplus purchases, and short-term bilateral surplus purchases.

Response:
Please see the attached tables.

2013 - Summary of PSNH Bilateral Purchases and ISO-NE Spot Purchases & Sales

Peak

2013	Total Bilateral Purchases MWh	Total Bilateral Purchases $000	Ave Price $/MWh	Sales of Surplus Purchases MWh	Percent (%) Sold as Surplus	Profit / (Loss) on Sales $000	Total ISO-NE Spot Purchases MWh	Total ISO-NE Spot Purchases $000	Ave Price $/MWh
Jan	4,800	204	42.50	920	19%	(9)	5,984	481	80.45
Feb	0	0	0.00	0	0%	0	1,193	129	108.02
Mar	5,600	469	83.68	971	17%	11	325	34	103.34
Apr	84,000	4,120	49.05	13,678	16%	(9)	7,047	365	51.82
May	78,400	3,607	46.00	10,938	14%	90	4,246	187	43.94
Jun	48,000	1,986	41.37	1,067	2%	(5)	17,945	597	33.25
Jul	29,600	1,364	46.08	1,692	6%	93	30,589	1,670	54.58
Aug	56,000	2,266	40.46	3,000	5%	(2)	53,324	2,438	45.72
Sep	80,000	3,616	45.20	5,656	7%	163	11,398	621	54.52
Oct	73,600	3,327	45.20	0	0%	(1)	39,839	1,639	41.14
Nov	68,800	3,116	45.29	2,031	3%	37	28,280	1,471	52.03
Dec	16,800	1,139	67.82	145	1%	59	14,662	1,646	112.23
Totals	545,600	25,213	46.21	40,097	7%	427	214,833	11,277	52.49

Off-Peak

2013	Total Bilateral Purchases MWh	Total Bilateral Purchases $000	Ave Price $/MWh	Sales of Surplus Purchases MWh	Percent (%) Sold as Surplus	Profit / (Loss) on Sales $000	Total ISO-NE Spot Purchases MWh	Total ISO-NE Spot Purchases $000	Ave Price $/MWh
Jan	3,200	110	34.40	1,195	37%	0	2,923	283	96.99
Feb	0	0	0.00	0	0%	0	1,086	62	57.25
Mar	14,400	639	44.36	2,621	18%	0	5,037	262	51.97
Apr	20,800	936	45.02	1,995	10%	17	37,303	1,472	39.45
May	28,800	1,134	39.36	2,116	7%	(5)	21,605	857	39.69
Jun	19,200	745	38.79	113	1%	(7)	42,958	1,346	31.33
Jul	14,400	668	46.39	4,835	34%	1	33,543	1,284	38.29
Aug	27,200	946	34.76	156	1%	(3)	62,283	1,888	30.31
Sep	40,000	1,808	45.20	1,420	4%	(6)	44,191	1,452	32.85
Oct	25,600	1,157	45.20	44	0%	0	57,999	1,658	28.58
Nov	32,000	1,446	45.20	1,901	6%	16	48,944	1,743	35.62
Dec	6,400	384	60.00	3,649	57%	(2)	21,562	1,287	59.70
Totals	232,000	9,973	42.99	20,044	9%	11	379,433	13,594	35.83

Total

2013	Total Bilateral Purchases MWh	Total Bilateral Purchases $000	Ave Price $/MWh	Sales of Surplus Purchases MWh	Percent (%) Sold as Surplus	Profit / (Loss) on Sales $000	Total ISO-NE Spot Purchases MWh	Total ISO-NE Spot Purchases $000	Ave Price $/MWh
Jan	8,000	314	39.26	2,115	26%	(9)	8,907	765	85.88
Feb	0	0	#DIV/0!	0	0%	0	2,279	191	83.82
Mar	20,000	1,107	55.37	3,591	18%	11	5,362	295	55.08
Apr	104,800	5,057	48.25	15,673	15%	8	44,350	1,837	41.41
May	107,200	4,740	44.22	13,054	12%	85	25,851	1,044	40.39
Jun	67,200	2,731	40.63	1,181	2%	(12)	60,902	1,942	31.89
Jul	44,000	2,032	46.18	6,526	15%	95	64,132	2,954	46.06
Aug	83,200	3,211	38.60	3,156	4%	(6)	115,607	4,326	37.42
Sep	120,000	5,424	45.20	7,076	6%	157	55,589	2,073	37.29
Oct	99,200	4,484	45.20	44	0%	(1)	97,839	3,297	33.69
Nov	100,800	4,562	45.26	3,931	4%	52	77,224	3,215	41.63
Dec	23,200	1,523	65.66	3,794	16%	57	36,224	2,933	80.96
Totals	777,600	35,186	45.25	60,142	8%	438	594,266	24,871	41.85

2013 - Summary of PSNH Bilateral and Spot Purchases

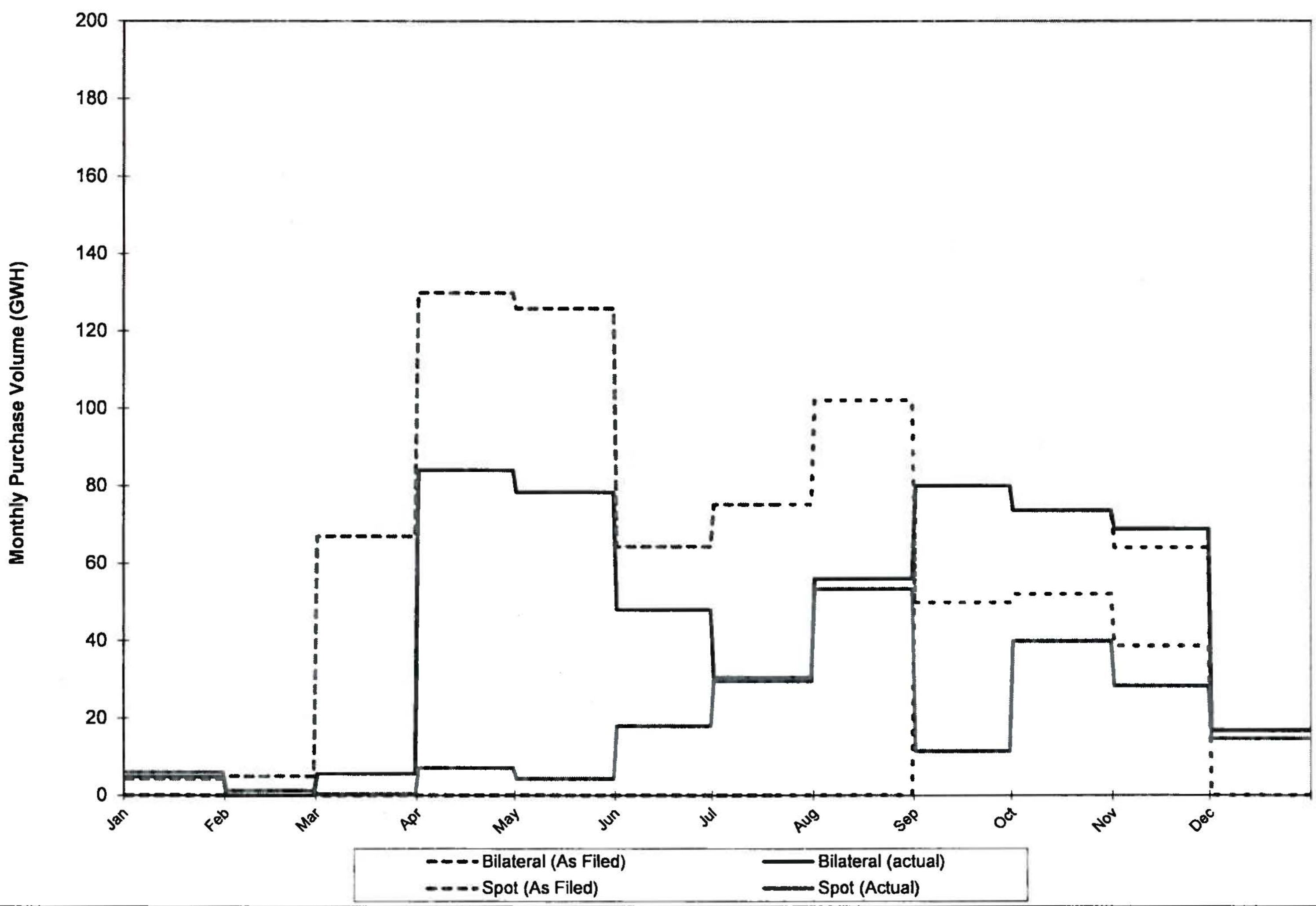
Peak

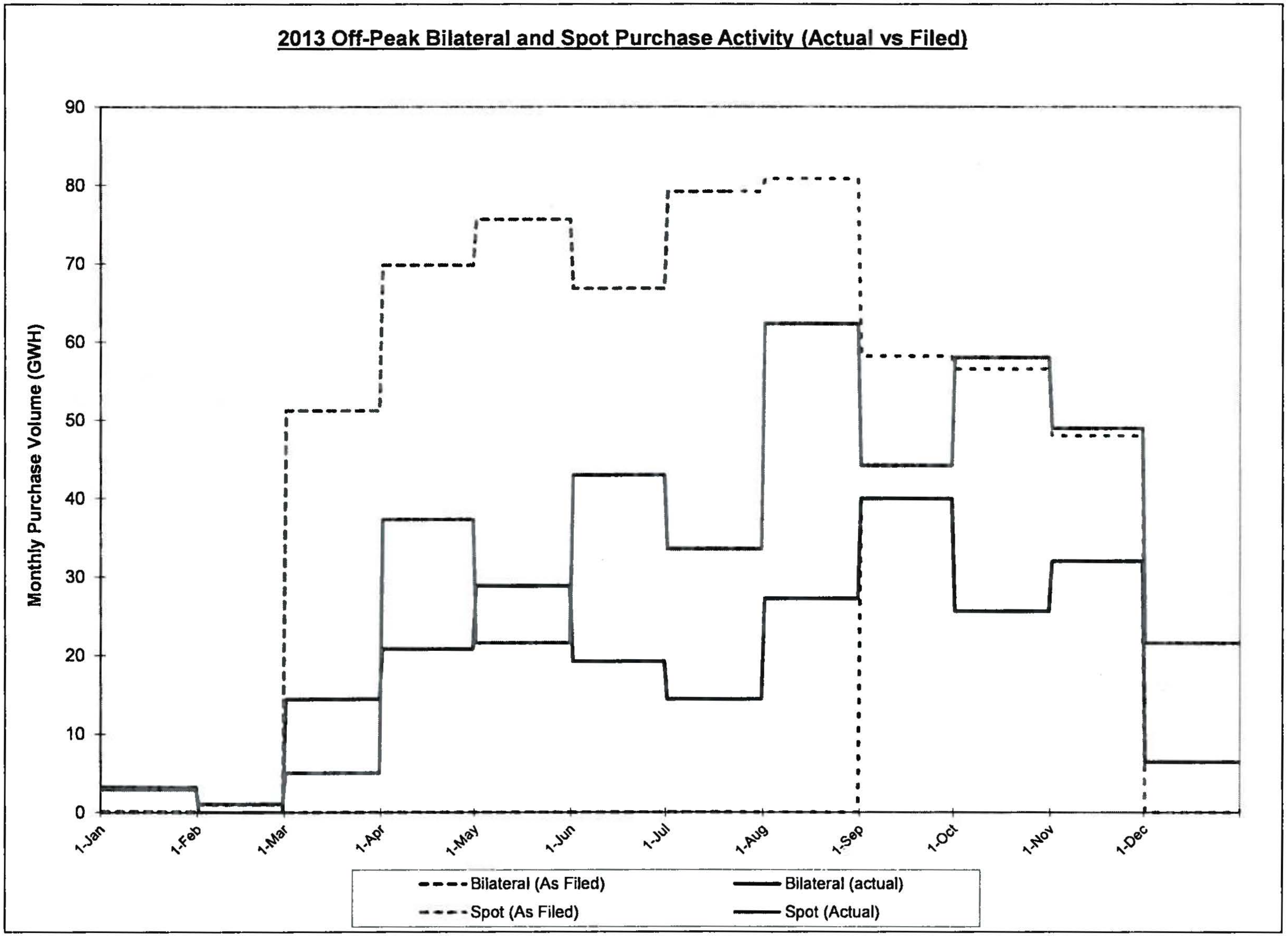
	Actual 2012 Purchase Quantities		Purchase Quantities Filed with Rate Request	
2013	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh
1	4,800	5,984	0	4,161
2	0	1,193	0	4,980
3	5,600	325	0	66,932
4	84,000	7,047	0	129,861
5	78,400	4,246	0	125,799
6	48,000	17,945	0	64,372
7	29,600	30,589	0	75,154
8	56,000	53,324	0	102,092
9	80,000	11,398	80,000	49,843
10	73,600	39,839	73,600	51,990
11	68,800	28,280	64,000	38,586
12	16,800	14,662	0	0
Totals	545,600	214,833	217,600	713,771

Off-Peak

2013	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh
1	3,200	2,923	0	129
2	0	1,086	0	1,006
3	14,400	5,037	0	51,227
4	20,800	37,303	0	69,801
5	28,800	21,605	0	75,663
6	19,200	42,958	0	66,811
7	14,400	33,543	0	79,174
8	27,200	62,283	0	80,830
9	40,000	44,191	40,000	58,173
10	25,600	57,999	25,600	56,552
11	32,000	48,944	32,000	48,012
12	6,400	21,562	0	0
Totals	232,000	379,433	97,600	587,377

2013 Peak Bilateral and Spot Purchase Activity (Actual vs Filed)




2013 Off-Peak Bilateral and Spot Purchase Activity (Actual vs Filed)
Monthly Purchase Volume (GWH)
90
80
70
60
50
40
30
20
10
0
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Bilateral (As Filed)
Bilateral (actual)
Spot (As Filed)
Spot (Actual)

Summary of PSNH Supplemental Purchases

	Peak Power				Off-Peak Power			
Month	Total Supplemental Purchases MWh	% Monthly Bilateral Purchases	% Short-Term Bilateral Purchases	% ISO-NE Spot Market Purchases	Total Supplemental Purchases MWh	% Monthly Bilateral Purchases	% Short-Term Bilateral Purchases	% ISO-NE Spot Market Purchases
Jan-09	101,908	76.5%	9.4%	14.1%	78,400	89.3%	2.0%	8.6%
Feb-09	116,667	60.8%	21.3%	18.0%	93,777	67.6%	9.4%	23.1%
Mar-09	97,466	97.5%	0.0%	2.5%	53,158	94.7%	0.0%	5.3%
Apr-09	153,880	97.9%	0.0%	2.1%	85,719	91.0%	0.0%	9.0%
May-09	102,878	87.7%	0.0%	12.3%	63,863	81.5%	0.0%	18.5%
Jun-09	139,494	96.7%	2.3%	1.0%	59,754	73.8%	16.1%	10.1%
Jul-09	138,618	88.8%	3.5%	7.7%	55,855	80.4%	0.0%	19.6%
Aug-09	208,363	82.4%	2.3%	15.3%	181,439	77.6%	2.6%	19.8%
Sep-09	197,340	99.6%	0.0%	0.4%	136,060	91.1%	0.0%	8.9%
Oct-09	175,107	97.5%	0.0%	2.5%	134,834	93.6%	0.0%	6.4%
Nov-09	156,225	99.2%	0.0%	0.8%	133,936	96.0%	0.0%	4.0%
Dec-09	115,172	86.6%	4.9%	8.5%	62,484	75.5%	0.0%	24.5%
Jan-10	67,439	87.5%	0.0%	12.5%	61,517	23.7%	10.4%	65.9%
Feb-10	71,079	83.3%	6.8%	10.0%	24,877	48.5%	0.0%	51.5%
Mar-10	68,285	99.3%	0.0%	0.7%	17,521	74.7%	0.0%	25.3%
Apr-10	73,397	85.0%	0.0%	15.0%	31,343	34.4%	0.0%	65.6%
May-10	75,573	75.4%	0.0%	24.6%	46,155	22.9%	13.9%	63.3%
Jun-10	72,635	89.0%	0.0%	11.0%	29,674	39.9%	0.0%	60.1%
Jul-10	84,048	74.0%	0.0%	26.0%	62,204	22.9%	11.6%	65.5%
Aug-10	84,106	77.7%	11.4%	10.9%	36,665	38.0%	0.0%	62.0%
Sep-10	86,514	72.0%	12.9%	15.0%	41,542	32.9%	15.4%	51.7%
Oct-10	139,480	44.3%	31.5%	24.1%	111,809	12.5%	37.2%	50.3%
Nov-10	119,323	107.9%	-18.8%	10.8%	83,138	107.1%	-33.7%	26.6%
Dec-10	69,490	97.3%	0.0%	2.7%	17,835	71.8%	0.0%	28.2%
Jan-11	56,857	59.1%	25.3%	15.6%	11,781	0.0%	0.0%	100.0%
Feb-11	36,362	88.0%	0.0%	12.0%	12,867	0.0%	0.0%	100.0%
Mar-11	44,335	83.0%	0.0%	17.0%	25,899	0.0%	0.0%	100.0%
Apr-11	74,639	45.0%	31.1%	23.9%	45,890	0.0%	33.1%	66.9%
May-11	115,474	87.3%	0.0%	12.7%	106,992	57.2%	9.0%	33.8%
Jun-11	90,782	38.8%	6.2%	55.1%	35,780	0.0%	0.0%	100.0%
Jul-11	79,652	40.2%	0.0%	59.8%	84,524	0.0%	0.0%	100.0%
Aug-11	138,455	26.6%	12.1%	61.3%	93,072	0.0%	13.8%	86.2%
Sep-11	148,806	22.6%	40.3%	37.1%	129,557	0.0%	25.3%	74.7%
Oct-11	114,936	29.2%	44.5%	26.2%	106,750	0.0%	27.0%	73.0%
Nov-11	95,498	35.2%	37.7%	27.1%	68,057	0.0%	0.0%	100.0%
Dec-11	118,634	28.3%	42.5%	29.2%	98,800	0.0%	25.1%	74.9%
Jan-12	41,627	0.0%	7.7%	92.3%	20,120	0.0%	0.0%	100.0%
Feb-12	69,163	0.0%	13.9%	86.1%	48,310	0.0%	19.9%	80.1%
Mar-12	95,550	0.0%	40.2%	59.8%	68,212	0.0%	25.8%	74.2%
Apr-12	133,188	25.2%	45.0%	29.7%	110,766	0.0%	21.7%	78.3%
May-12	120,972	43.6%	19.8%	36.5%	89,571	0.0%	21.4%	78.6%
Jun-12	116,866	71.9%	4.8%	23.3%	92,621	23.3%	11.2%	65.5%
Jul-12	68,107	24.7%	10.6%	64.8%	67,149	0.0%	6.0%	94.0%
Aug-12	142,446	64.6%	8.4%	27.0%	100,160	25.6%	16.0%	58.5%
Sep-12	120,452	63.1%	13.3%	23.6%	119,609	22.1%	20.7%	57.2%
Oct-12	119,020	46.4%	12.1%	41.5%	81,612	15.7%	11.8%	72.6%
Nov-12	81,941	61.5%	0.0%	38.5%	64,633	22.3%	7.4%	70.3%
Dec-12	31,789	0.0%	37.7%	62.3%	12,880	0.0%	0.0%	100.0%
Jan-13	10,784	0.0%	44.5%	55.5%	6,123	0.0%	52.3%	47.7%
Feb-13	1,193	0.0%	0.0%	100.0%	1,086	0.0%	0.0%	100.0%
Mar-13	5,925	0.0%	94.5%	5.5%	19,437	0.0%	74.1%	25.9%
Apr-13	91,047	77.3%	14.9%	7.7%	58,103	0.0%	35.8%	64.2%
May-13	82,646	85.2%	9.7%	5.1%	50,405	0.0%	57.1%	42.9%
Jun-13	65,945	0.0%	72.8%	27.2%	62,158	0.0%	30.9%	69.1%
Jul-13	60,189	0.0%	49.2%	50.8%	47,943	0.0%	30.0%	70.0%
Aug-13	109,324	0.0%	51.2%	48.8%	89,483	0.0%	30.4%	69.6%
Sep-13	91,398	87.5%	0.0%	12.5%	84,191	47.5%	0.0%	52.5%
Oct-13	113,439	64.9%	0.0%	35.1%	83,599	30.6%	0.0%	69.4%
Nov-13	97,080	65.9%	4.9%	29.1%	80,944	39.5%	0.0%	60.5%
Dec-13	31,462	0.0%	53.4%	46.6%	27,962	0.0%	22.9%	77.1%

Year								
2009	1,703,118	90.2%	3.1%	6.7%	1,139,279	85.1%	2.2%	12.7%
2010	1,011,370	80.9%	4.7%	14.4%	564,281	40.9%	7.1%	52.1%
2011	1,114,432	42.6%	23.1%	34.2%	819,970	7.5%	15.1%	77.4%
2012	1,141,119	40.4%	17.7%	41.9%	875,643	11.5%	16.0%	72.5%
2013	760,433	47.1%	24.6%	28.3%	611,433	16.0%	22.0%	62.1%

2013 - Summary of PSNH Spot Sales

Peak

2013	Total ISO-NE Spot Sales MWh	Surplus Sales from Generation MWh	Surplus Sales from Bilateral MWh	Total ISO-NE Spot Sales $000	Avg Sale $/MWh
Jan	29,172	28,252	920	3,426	117.44
Feb	44,713	44,713	0	5,419	121.19
Mar	38,945	37,974	971	1,845	47.37
Apr	13,783	105	13,678	596	43.21
May	13,913	2,974	10,938	697	50.10
Jun	4,884	3,817	1,067	62	12.76
Jul	12,244	10,552	1,692	1,538	125.60
Aug	7,217	4,218	3,000	205	28.34
Sep	7,278	1,622	5,656	205	28.11
Oct	0	0	0	0	0.00
Nov	2,947	916	2,031	133	45.07
Dec	24,529	24,384	145	3,431	139.87
Totals	199,625	159,528	40,097	17,555	87.94

Off-Peak

2013	Total ISO-NE Spot Sales MWh	Surplus Sales from Generation MWh	Surplus Sales from Bilateral MWh	Total ISO-NE Spot Sales $000	Avg Sale $/MWh
Jan	49,264	48,068	1,195	4,075	82.71
Feb	72,589	72,589	0	7,593	104.60
Mar	53,022	50,402	2,621	2,314	43.64
Apr	1,995	0	1,995	82	41.31
May	3,871	1,756	2,116	66	17.13
Jun	9,821	9,708	113	315	32.07
Jul	20,777	15,943	4,835	837	40.30
Aug	2,598	2,442	156	53	20.31
Sep	1,701	281	1,420	17	10.22
Oct	44	0	44	1	16.39
Nov	1,906	6	1,901	88	45.92
Dec	38,099	34,450	3,649	3,871	101.60
Totals	255,688	235,644	20,044	19,312	75.53

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-017 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, (Bates 54, lines 24 through 26): Please provide tables, by unit, that support the statements made regarding a) the MWh produced, and the availability during the 30 highest priced days. As part of your response, please provide similar tables and values for 2010 through 2012.

Response:
PSNH objects to the question to the extent that it requests information outside the scope of the docket. Subject to, and without waiving, this objection, PSNH will provide a response in accordance with the procedural schedule in the docket.

This response provides 2013 data added to the information previously provided in DE 13-108, Staff 01-016.

a) The attached table contains generation by unit for the PSNH fleet.
b) The table below provides availability by unit during the 30 highest priced days as discussed in Smagula testimony.

Unit	30-Day Availability (Percent)			
	2010	**2011**	**2012**	**2013**
MERRIMACK 1	99.2	99.3	99.6	99.7
MERRIMACK 2	90.7	89.8	99.5	98.4
NEWINGTON 1	95.2	96.2	99.6	99.6
SCHILLER 4	97.4	99.1	96.6	97.8
SCHILLER 5	80.5	96.2	96.3	99.0
SCHILLER 6	98.6	99.9	100.0	96.0
PSNH FLEET	93.8	94.6	98.2	98.3

PSNH Generation Fleet

	2010	2011	2012	2013
HYDRO	(mwhrs)	(mwhrs)	(mwhrs)	(mwhrs)
AMOSKEAG	74,005	104,593	86,519	93,685
AYERS ISLAND	44,439	49,888	45,857	46,695
CANAAN	7,083	6,016	5,564	6,000
EASTMAN FALLS	25,288	28,929	22,749	27,422
GARVINS	40,387	53,958	43,772	47,315
GORHAM	11,586	12,073	11,966	12,170
HOOKSET	6,916	7,911	8,521	9,360
JACKMAN	8,760	16,240	8,543	10,437
SMITH	117,891	85,464	96,473	110,754
STEAM				
MERRIMACK #1	671,207	577,803	344,945	360,299
MERRIMACK #2	1,992,960	1,404,855	836,949	957,314
SCHILLER #4	224,603	121,967	47,256	94,953
SCHILLER #5	316,907	298,105	337,900	331,678
SCHILLER #6	217,159	107,413	47,748	81,968
NEWINGTON	222,683	125,215	67,808	80,834
COMBUSTION TURBINES				
MERRIMACK CT-1	153	118	9	605
MERRIMACK CT-2	77	83	54	398
SCHILLER CT	462	176	55	233
LOST NATION CT	7	9	42	360
WHITE LAKE	31	81	(75)	433
TOTAL GENERATION:	3,982,604	3,000,894	2,012,657	2,272,913

Numbers may not add due to rounding

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-018 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, (Bates 54, lines 28 through 29): Please provide a table that supports the statement made regarding the aggregate equivalent availability. As part of your response, please provide similar tables and values for 2010 through 2012.

Response:
PSNH objects to the question to the extent that it requests information outside the scope of the docket. Subject to, and without waiving, this objection, PSNH will provide a response in accordance with the procedural schedule in the docket.

Below 2013 data has been added to the information provided in DE 13-108, Staff 01-017.

Annual Equivalent Availability				
	2010	2011	2012	2013
MK1	85.4%	79.8%	86.3%	88.1%
MK2	86.8%	84.0%	74.5%	69.1%
NT	96.2%	93.7%	95.3%	96.6%
SR4	87.1%	89.6%	83.6%	95.7%
SR5	86.5%	83.9%	91.6%	91.9%
SR6	97.0%	91.8%	90.2%	88.2%
Aggregate	91.0%	88.1%	86.4%	85.7%

Note:
Some outages were extended to reduce overtime costs during low priced periods, e.g. Merrimack 2.
Longer outage durations will reduce a unit's availability.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-019 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Please define the meaning of the term "equivalent availability".

Response:
The term equivalent availability is an industry standardized metric, and is used to represent the portion of hours that a unit is available to be dispatched at full capacity. Equivalent availability is recognized by the North American Electric Reliability Corporation (NERC) and other regional entities such as ISO-NE. The NERC approved equation to calculate the Equivalent Availability Factor is:

EAF = [(Available Hours – Equivalent Unit Derated Hours) * 100] ÷ Period Hours.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-020 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
For Merrimack, Schiller and Newington Station, please provide by month the actual average capacity at which the plants operated in each month.

Response:
Below are monthly capacity factors for each of the steam units at Merrimack, Newington and Schiller.

2013	MK1	MK2	NT	SR4	SR5	SR6
Jan	71%	91%	6%	46%	93%	43%
Feb	96%	94%	7%	60%	95%	67%
Mar	82%	71%	1%	25%	93%	8%
Apr	5%	0%	0%	14%	39%	10%
May	5%	3%	0%	8%	89%	6%
Jun	23%	19%	1%	6%	98%	6%
Jul	48%	50%	6%	20%	95%	18%
Aug	9%	7%	3%	15%	96%	3%
Sep	5%	4%	0%	3%	96%	3%
Oct	0%	0%	0%	0%	77%	2%
Nov	25%	0%	1%	21%	93%	20%
Dec	90%	62%	3%	62%	92%	52%
TOTAL	38%	33%	2%	23%	88%	19%

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. STAFF 1-021 | **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **William H. Smagula**

Request:
Reference Smagula testimony, (Bates 55, lines 17 through 23): Please supply a table that shows the time line of Newington oil inventory levels for 2013. That time line should show oil inventory in bbl., total cost, sales in bbl. and money received, cost of sales (studies plus dock facilities), and ending inventory in bbl. and cost. The table response should support the customer benefit cited in the referenced testimony.

Response:
Below is a table that shows the end of month inventory volumes in barrels and the corresponding dollar value. Newington had no sales in 2013.

	End of Month Inventory Volume (barrels)	End of Month Inventory Value ($000)
Jan	121,137	$9,885
Feb	87,776	$8,395
Mar	122,064	$11,928
Apr	119,949	$11,839
May	117,447	$11,634
Jun	113,896	$11,271
Jul	93,026	$9,431
Aug	194,543	$19,949
Sep	194,065	$19,973
Oct	193,174	$19,896
Nov	240,035	$25,002
Dec	222,318	$23,147

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. STAFF 1-022 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, (Bates 58): For each outage listed in the table of the referenced page, please identify any opportunities PSNH lost to run the unit and if such opportunities were lost, please describe and quantify customer benefits lost.

Response:
Please see Shelnitz Testimony, Attachment MLS-2 (Bates 11). This attachment provides the replacement power cost (RPC) associated with each of the 9 outages noted in Smagula testimony (Bates 58). Specifically this outage list confirms that three of the outages, OR-2, OR-8 and OR-9, resulted in replacement power costs as listed below. The remaining 6 outages were either scheduled (Preventative Maintenance Outage) or occurred during a low cost period and resulted in no replacement power costs.

OUTAGE	RPC
OR-2	$190,229
OR-8	$737,535
OR-9	$130,133

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-001 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael L. Shelnitz

Request:
Reference Shelnitz testimony, Bates page 5, lines 11 through 22. Please supply the dollar value of services provided by NU and NSTAR separately and in total for the years 2011 through 2013. If there is an increase in the aggregate values, please provide as response as to why such variance exists.

Response:

The following are the dollar value of services provided by NUSCO and NSTAR for the years 2011 through 2013:

NUSCO:

2011	$10,844,460
2012	$11,754,640
2013	$7,965,854

NSTAR:

2011	$0
2012	$916,211
2013	$1,297,258

Total:

2011	$10,844,460
2012	$12,670,851
2013	$9,263,111

The increase in the aggregate value of 2012 over 2011 of $1.8 million was due primarily to increases in labor charges. A portion of these increased labor charges was due to higher allocation rates to PSNH due to certain allocations being based on gross plant assets, which increased in 2012 due to inclusion of the Merrimack Scrubber plant assets.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-002 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael L. Shelnitz

Request:
Reference Shelnitz testimony, Bates page 6, lines 8 through 11. Please reconcile the cause of the O&M variances.

Response:
Please note that when ES rates are calculated, non-scrubber O&M is calculated by taking total estimated fossil/hydro O&M and subtracting an estimated scrubber O&M. When this calculation was performed for the July 1, 2013, ES rate, the estimated amount deducted for scrubber O&M was higher than the actual amount, resulting in the non-scrubber O&M amount included in rates being set too low. This difference was the primary cause of the 2013 under recovery attributed to O&M.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-003 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Michael L. Shelnitz

Request:
Reference Shelnitz testimony, Bates page 8, lines 20 through 26. Please provide a narrative as to what future charges and credits may exist in 2014 with NAEC. As part of that narrative, please approximate the dollar values.

Response:
The Seabrook related accounting between PSNH and NAEC is still in place for Seabrook sale reconciliation purposes. Types of charges and credits that may occur in the future are pension and post-retirement benefit costs and refunds from nuclear insurance policies that NAEC held. PSNH is unable to forecast these future charges or credits which are typically not material. For 2014 there has been a total Seabrook credit of $126,339 through September.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-004 **Page 1 of 15**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, Bates page 42, lines 15 through 17. Please elaborate on the constraints on the natural gas delivery system, the impacts on the price of delivered natural gas, and the cost to PSNH consumers.

Response:
Issues regarding the availability of natural gas during winter periods for use by gas-fired electric generation have been well publicized and are generally known. In addition, it is generally known that in New England there is a high correlation between the cost of natural gas and prices for electricity. Natural-gas-fired space heating demand has priority on natural gas transportation pipelines and utilizes the majority of available pipeline capacity during cold weather periods, leaving insufficient pipeline capacity available to fuel all the natural-gas-fired electric generation in the region. Attachment FBW-4 referenced in the section of testimony referred to in the question shows the strong correlation in New England between natural gas and electric energy prices. When supplemental purchases from the market are required to serve PSNH ES customer load during these high priced periods customers are exposed to these high prices, and when PSNH's generation and supply resources are sufficient to meet (or exceed) customer load during these high priced periods customers are insulated (or benefit) from these high prices.

Some studies on this topic can be accessed from the following links. See also the attached ISO-NE presentation dated October 29, 2014.
http://www.iso-ne.com/static-assets/documents/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2014/apr292014/a3_icf_benchmarking_study.pdf
http://www.iso-ne.com/static-assets/documents/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2013/dec182013/a3_icf_phase_2_gas_study_presentation.pdf
http://www.nescoe.com/uploads/Phase_III_Gas-Elec_Report_Sept._2013.pdf

OCTOBER 29, 2014 | CONCORD, NEW HAMPSHIRE

ISO New England Overview and Regional Update

New Hampshire Bar Association:
Telecommunications, Energy and Utilities Section

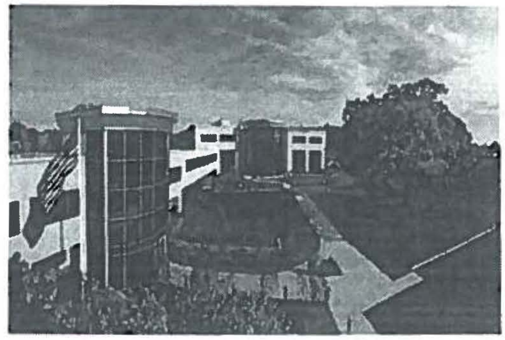
Michael Giaimo, Esq. and Greggory Wade, Esq.
EXTERNAL AFFAIRS, ISO NEW ENGLAND

Presentation Outline

- ISO Background
- Reliance on Natural Gas
- Price Implications
- Generator Retirements
- Renewable Portfolio Standards and Generator Interconnection Proposals
- Transmission
- Challenges and Solutions

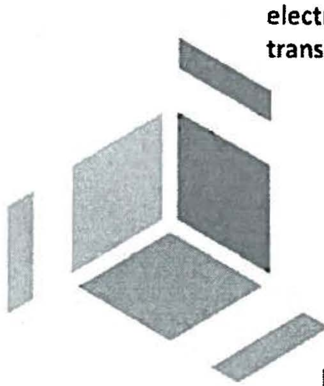
About ISO New England

- Private not-for-profit
- Regulated by the Federal Energy Regulatory Commission (FERC)
- Independent of companies doing business in market
- Located in western Massachusetts



3

Reliability is Core of ISO New England's Mission



Overseeing the day-to-day operation of New England's electric power generation and transmission system

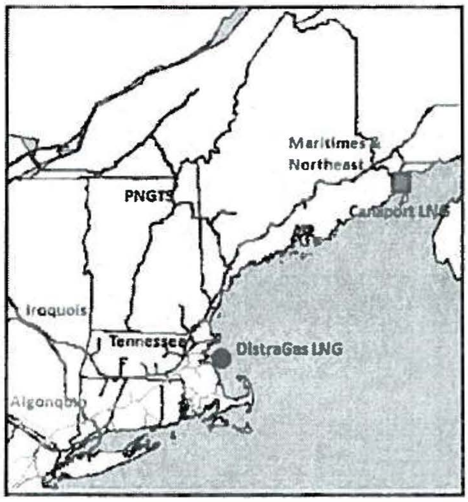
Managing comprehensive regional power system planning

Developing and administering the region's competitive wholesale electricity markets

4

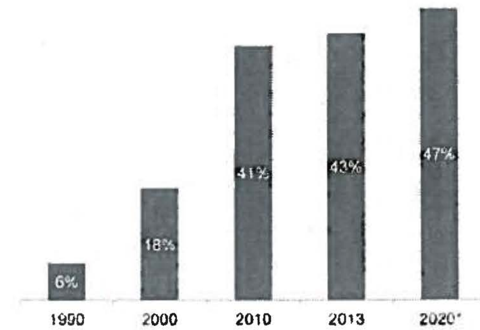
Region Has Limited Pipeline Capacity and Growing Reliance on Natural Gas for Power Generation

Limited Natural Gas Infrastructure



Generation Fuel Mix:

Natural Gas Capacity

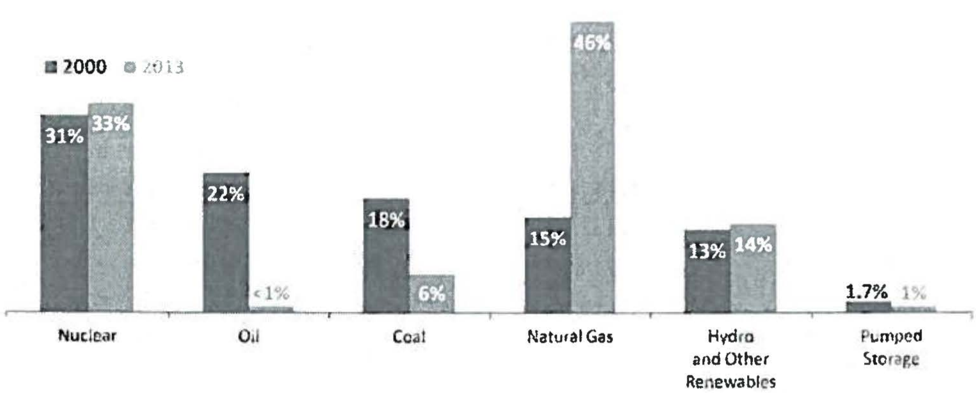


* Resources in 2020 assume approximately 5,000 MW of new resources proposed in the ISO Queue as of April 2013 (primarily natural gas and wind); and 3,200 MW of non-price retirement requests for coal, oil and nuclear resources as of October 2013.

5

Dramatic Changes in the Energy Mix

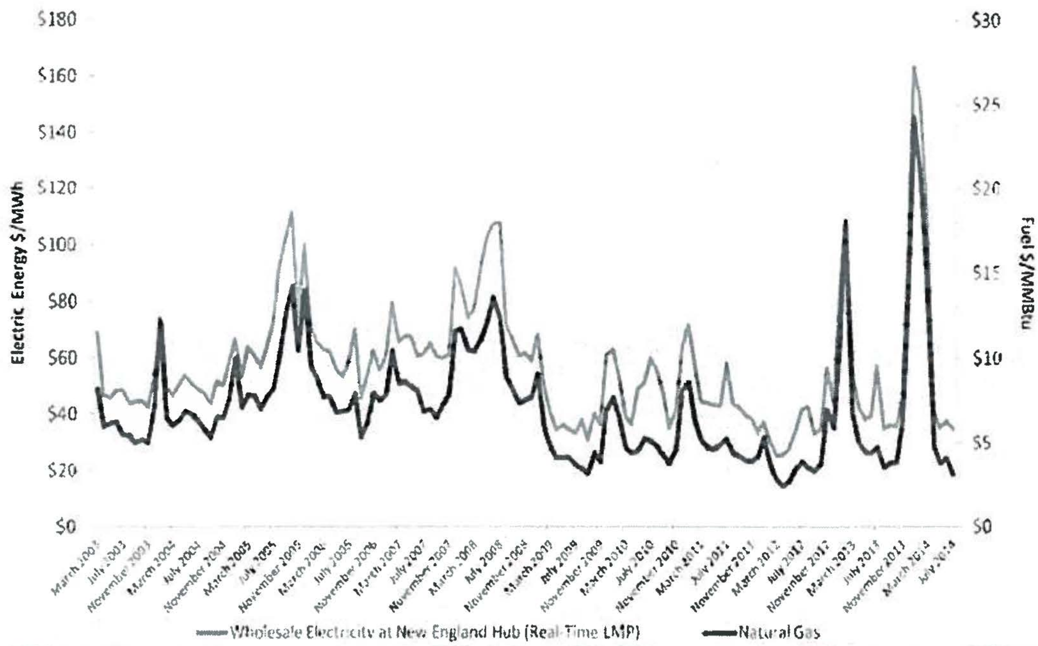
Percent of Total **Electric Energy** Production by Fuel Type
(2000 vs. 2013)



Source: ISO New England Net Energy and Peak Load by Source

6

Natural Gas and Wholesale Electricity Prices Linked



Power Plant Emissions have Declined with Changes in the Fuel Mix

Reduction in Aggregate Emissions (ktons/yr)

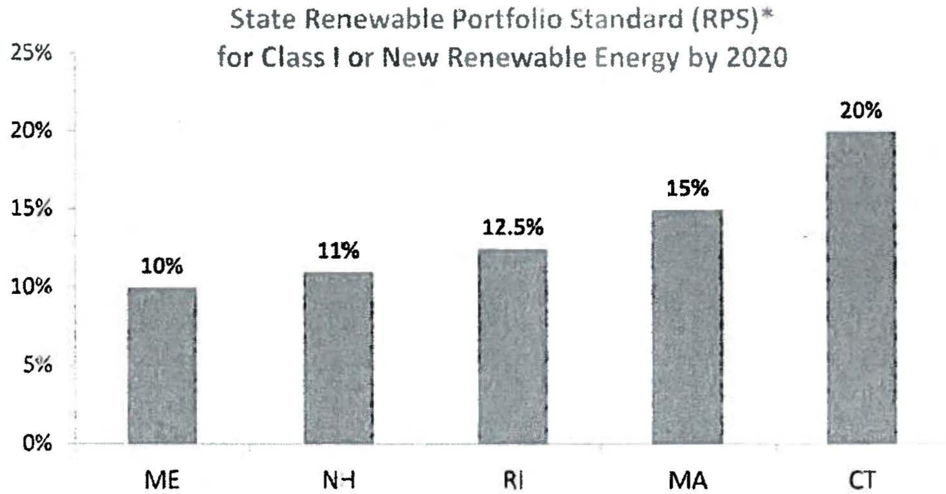
Year	NO_x	SO_2	CO_2
2001	59.73	200.01	52,991
2012	20.32	16.61	41,975
% Reduction, 2001–2012	**↓ 66%**	**↓ 92%**	**↓ 21%**

Reduction in Average Emission Rates (lb/MWh)

Year	NO_x	SO_2	CO_2
1999	1.36	4.52	1,009
2012	0.35	0.28	719
% Reduction, 1999–2012	**↓74%**	**↓ 94%**	**↓ 29%**

Source: 2012 ISO New England Electric Generator Air Emissions Report, January 2014

State Requirements Drive Proposals for Renewable Energy



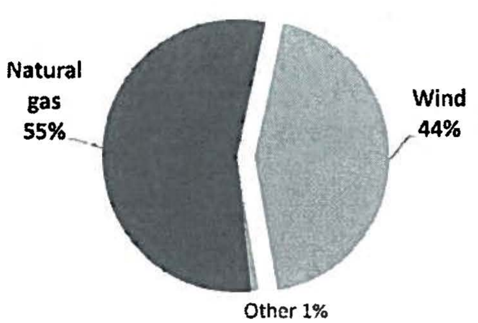
* State Renewable Portfolio Standards (RPS) promote the development of renewable energy resources by requiring electricity providers (electric distribution companies and competitive suppliers) to serve a minimum percentage of their retail load using renewable energy. Vermont does not have a formal RPS program. It relies on a program known as 'Sustainably Priced Energy Enterprise Development' (SPEED) to promote renewable energy development in the state.

9

Proposed Generation Is Primarily Gas and Wind

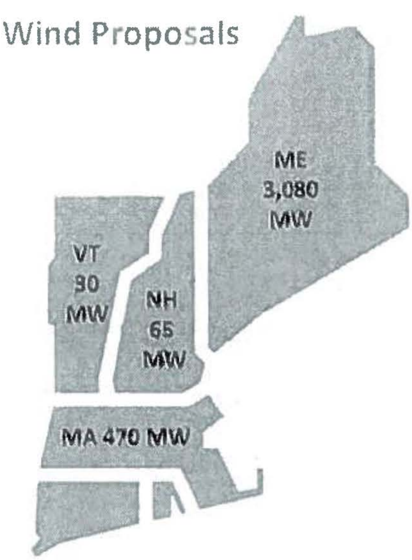
All Proposed Generation

Developers propose >5 GW of gas-fired generation and >3 GW wind; wind is mostly onshore in northern New England and offshore in southern New England



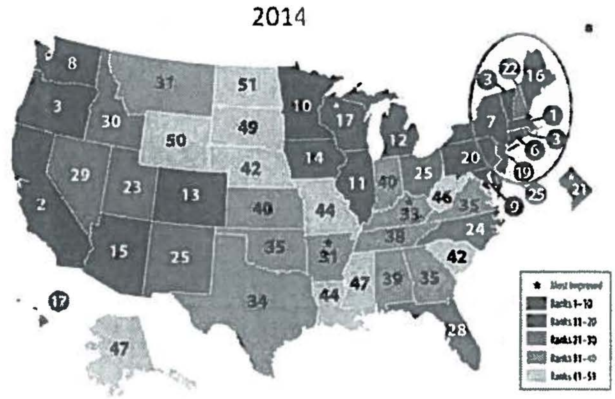
Source: ISO Generator Interconnection Queue (September 2014)
FERC Jurisdictional Proposals Only

Wind Proposals



10

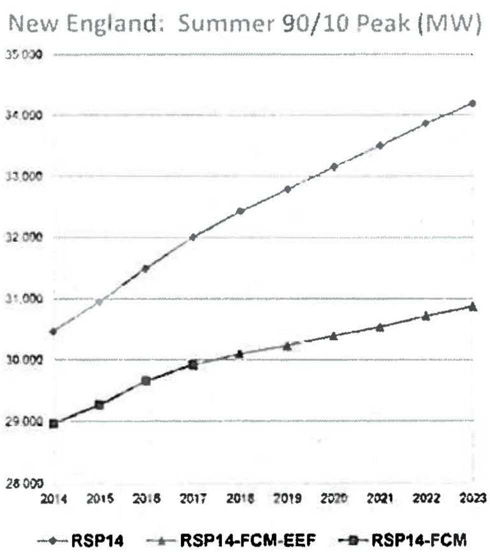
Energy Efficiency a Priority for New England

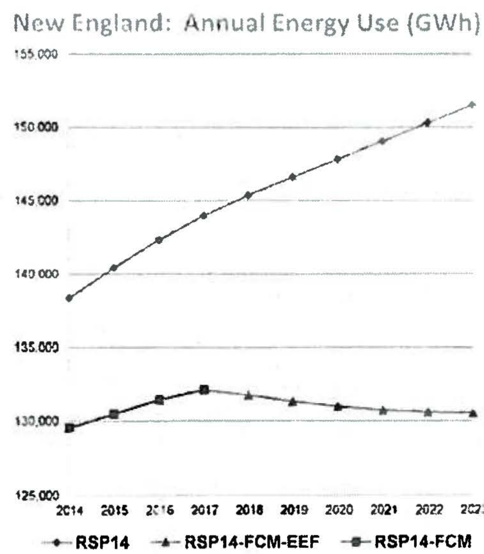


- Ranking of state EE efforts by the *American Council for an Energy-Efficient Economy* :
  - Massachusetts 1
  - Vermont 3
  - Rhode Island 3
  - Connecticut 6
  - Maine 16
  - New Hampshire 22

- In New England, billions spent over the past few years; more on the horizon
  - 2009 to 2012 = $2.3B
  - 2017 to 2023 states are projected to spend $6.3B

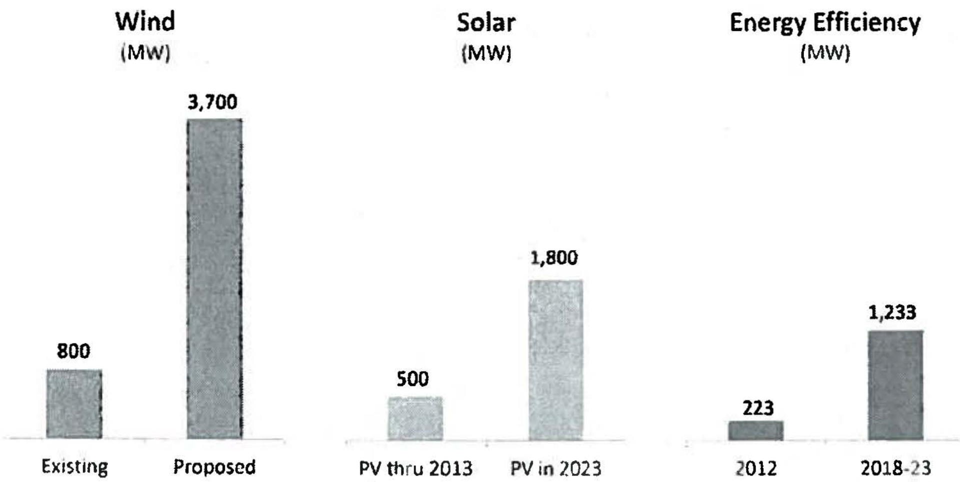
EE Affects New England's Electricity Consumption





Source: Final ISO New England EE Forecast for 2018-2023 (April 2014)

Renewables and EE are Trending Up



Nameplate capacity of existing wind resources and proposals in the ISO-NE Generator Interconnection Queue; megawatts (MW).

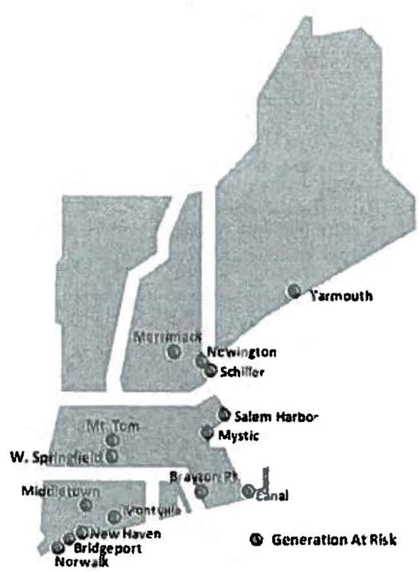
2014 Final Interim ISO-NE Solar PV Forecast, nameplate capacity, based on state policies.

Final ISO-NE Energy-Efficiency Forecast for 2016-23, peak MW savings based on state-sponsored EE program budgets; $5.7 billion

13

Resources Are At-Risk of Retiring

28 older units identified for being at risk of retiring

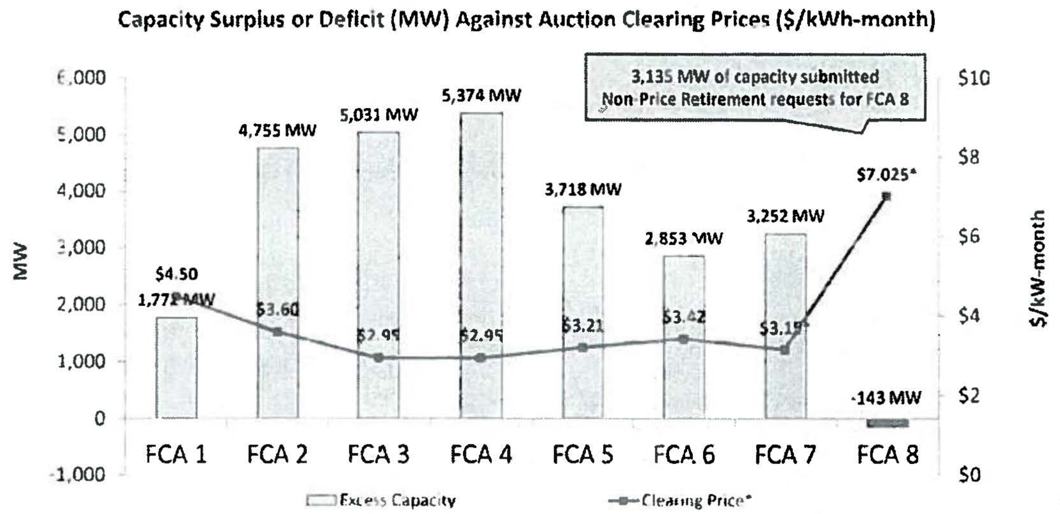


Source: *Generator Retirement Study*, ISO New England, 2012.

Unit	Unit Type	MW Maximum Assumed	In-service Date	Age in 2020
BRAYTON POINT 1	Coal	261	01-Aug-63	57
BRAYTON POINT 2	Coal	258	01-Jul-64	56
BRAYTON POINT 3	Coal	643	01-Jul-69	51
BRAYTON POINT 4	Oil	458	01-Dec-74	46
BRIDGEPORT HBR 2	Oil	190	01-Aug-61	59
BRIDGEPORT HBR 3	Coal	401	01-Aug-68	52
CANAL 1	Oil	597	01-Jul-68	52
CANAL 2	Oil	599	01-Feb-76	44
MERRIMACK 1	Coal	121	01-Dec-60	60
MERRIMACK 2	Coal	343	30-Apr-68	52
MIDDLETOWN 2	Oil	123	01-Jan-58	62
MIDDLETOWN 3	Oil	248	01-Jan-64	56
MIDDLETOWN 4	Oil	415	01-Jun-73	47
MONTVILLE 6	Oil	418	01-Jul-71	49
MOUNT TOM 1	Coal	159	01-Jun-60	60
MYSTIC 7 GT	Oil	615	01-Jun-75	45
NEW HAVEN HBR	Oil	483	01-Aug-75	45
NEWINGTON 1	Oil	424	01-Jun-74	46
NORWALK HBR 1	Oil	173	01-Jan-60	60
NORWALK HBR 2	Oil	179	01-Jan-63	57
SCHILLER 4	Coal	51	01-Apr-52	68
SCHILLER 6	Coal	51	01-Jul-57	63
W. SPRINGFIELD 3	Oil	111	01-Jan-57	63
YARMOUTH 1	Oil	56	01-Jan-57	63
YARMOUTH 2	Oil	56	01-Jan-58	62
YARMOUTH 3	Oil	122	01-Jul-65	55
YARMOUTH 4	Oil	632	01-Dec-78	42

14

Capacity Prices Vary with Changes in Supply



* Prices cleared at the floor price in the first seven auctions due to excess capacity, therefore, resources were paid a slightly lower prorated price. The clearing price in NEMA/Boston was $14.999/kW-month for FCA 7 (new capacity received $14.999/kW-month and existing capacity received an administrative price of $6.66/kW-month). The clearing price in FCA 8 was $15.00/kW-month (new capacity in all zones and existing capacity in NEMA/Boston received $15.00/kW-month and existing capacity in all other zones received an administrative price of $7.025/kW-month).

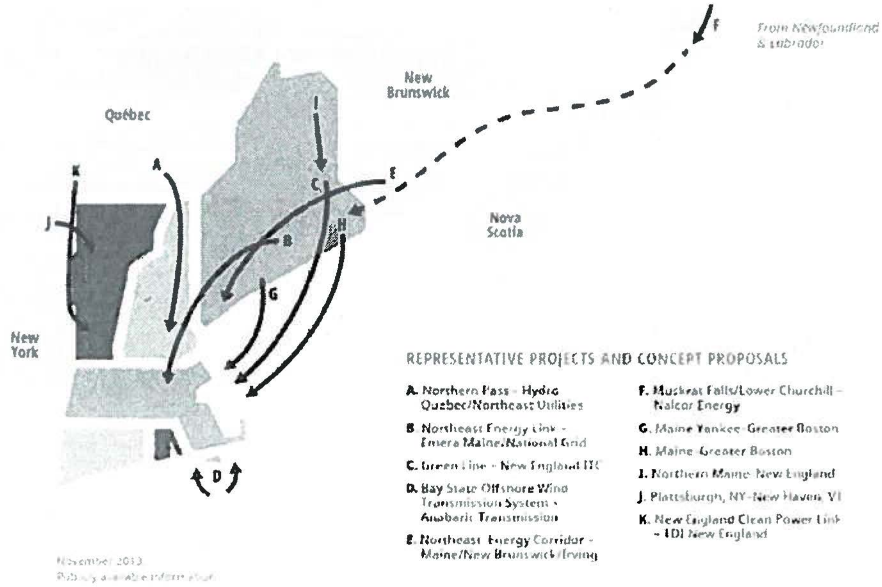
15

Transmission Needed to Get Wind to Market

- Population and electricity demand are concentrated in southern New England
- On-shore wind resources do not overlap with high energy demand areas
- New transmission will be needed to fully realize wind potential
- Greater distances require greater investment to get power to hub

16

On- and Off-shore Transmission Proposals are Vying to Move Renewable Energy to New England Load Centers

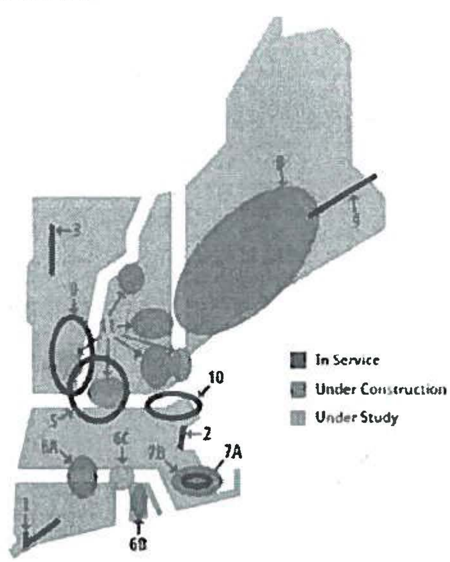


Note: These projects are NOT reliability projects, but ISO New England's role is to ensure the reliable interconnection of these types of projects

17

Transmission Projects to Maintain Reliability are Progressing in Each State

1. Southwest CT Phases I & II
2. Boston NSTAR 345 kV Project, Phases I & II
3. Northwest Vermont
4. Northeast Reliability Interconnect
5. Monadnock Area
6. New England East-West Solution
   a. Greater Springfield Reliability Project
   b. Rhode Island Reliability Project
   c. Interstate Reliability Project
7. Southeast Massachusetts
   a. Short-term upgrades
   b. Long-term Lower SEMA Project
8. Maine Power Reliability Program
9. Vermont Southern Loop
10. Merrimack Valley/North Shore Reliability
11. New Hampshire/Vermont Upgrades

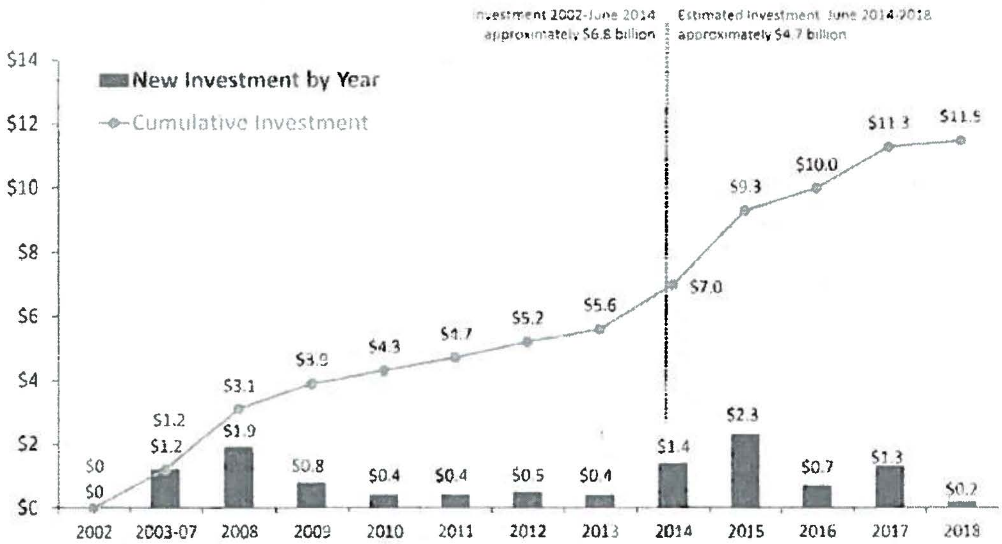


Source: RSP Transmission Project Listing, June 2014, (does not include "concept" projects)

18

New Transmission Investment in New England

$6.8 billion in transmission investment since 2002, $4.7 billion on the horizon



Source: ISO New England RSP Transmission Project Listing, Presentation to Planning Advisory Committee, October 2014
Estimated future investment includes projects under construction, planned and proposed

19

Transmission Upgrades in New England

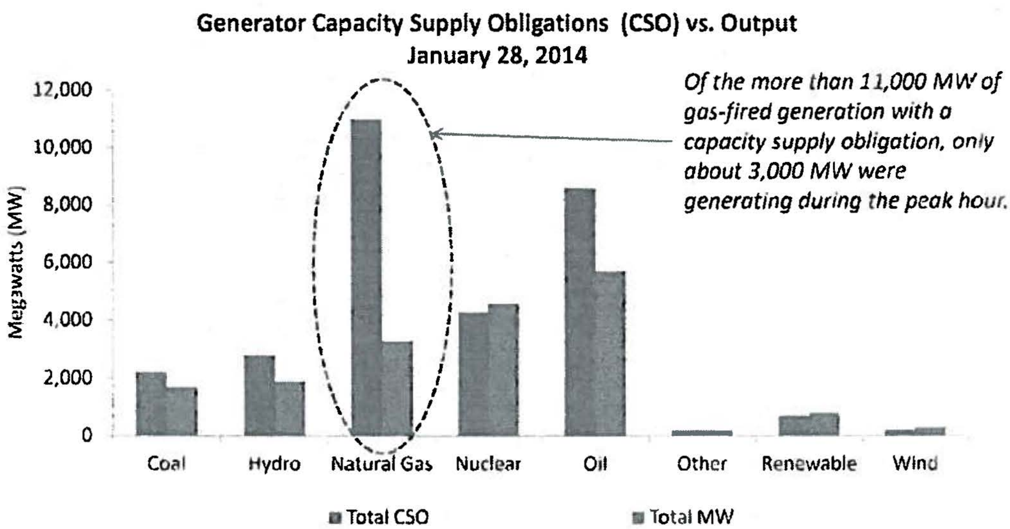
	Generally Funded by Entity Proposing Project	Funded by Region, Localized Costs Excluded
EXISTING		
Generation Interconnection	100%	
Elective Transmission	100%	
Merchant Transmission	100%	
Local Benefit Upgrades/ Localized Costs	100%	
Regional Benefit Upgrades (Reliability & Market Efficiency)		100%
PROPOSED		
Regional Benefit Upgrades (FERC Order 1000)	30%	70%

Regional Transmission Cost Allocation

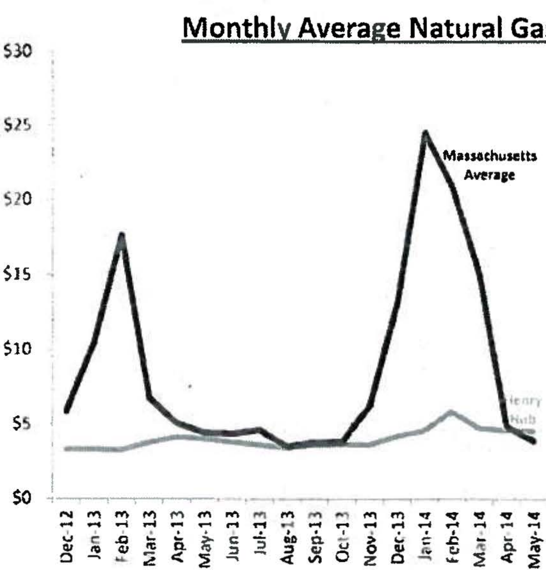
Source: 2013 Regional Network Load

20

Current Pipeline Infrastructure Is Inadequate to Serve Region's Natural Gas-fired Generation



Natural Gas Prices High Relative to Other Regions



Winter Monthly Gas Differentials
Winter natural gas prices in New England generally higher than New York and much higher than Henry Hub

Month	Henry Hub	MASS Avg.	New York	NY vs. MA Avg.	Henry Hub vs. MA Avg.
Dec-12	$3.35	$5.89	$4.54	($1.35)	($2.54)
Jan-13	$3.34	$10.45	$10.20	($0.25)	($7.11)
Feb-13	$3.30	$17.63	$10.81	($6.82)	($14.33)
Dec-13	$4.23	$13.13	$5.25	($7.88)	($8.90)
Jan-14	$4.60	$24.50	$28.15	$3.65	($19.90)
Feb-14	$5.88	$20.85	$11.34	($9.51)	($14.97)

Region is Taking Action to Improve Electric Market Efficiency and Improve Reliability

Recently Implemented (2012–2013)	Near-Term Actions (2013–2014)	Longer-Term Actions (2014–2019)
• Ongoing improvements to information sharing with natural gas pipelines • Moved Day-Ahead Market timeline in 2013 • Increased forward reserve requirements in 2013 • FERC clarification of generator obligations (must purchase fuel unless physically unavailable – economics is not an excuse)	• Tightened FCM Shortage Event trigger (effective Nov. 2013) • Winter Program (Dec. 2013 – Feb. 2014) • Developed energy market offer-flexibility enhancements (effective Dec. 2014)	• Winter Program (Dec. 2014 – Feb. 2015) • Strengthen Forward Capacity Market Performance Incentives "Pay-for-Performance" (will apply to 2018-19 commitment period)

23

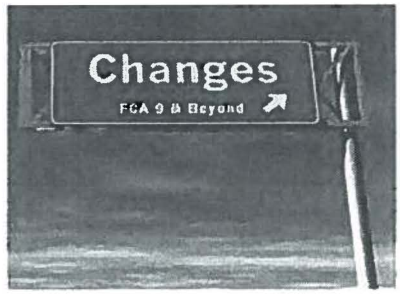
ISO Has Developed a New Reliability Program for the Coming Winter (2014–2015); Approved by FERC

- **Objectives:**
  - Augment scarce pipeline gas and improve the region's overall fuel security
  - Create an incentive for generators to secure fuel arrangements going into the winter, while offsetting their risk of having unused fuel at the end of the winter
- **Solutions:**
  - Offset costs for generators to commission **dual-fuel capability**
  - Offset the carrying costs of firm fuel purchased by generators **(fuel oil and LNG)** that is unused at the end of the winter season, and
  - Compensation for **demand response** services
- **Key drivers:**
  - Generators' difficulty in replenishing oil supplies mid-winter
  - Gas pipelines have proved to be more constrained than anticipated, and
  - Retirements of significant non-gas generators and the resulting loss of fuel diversity
- **Differences from last year:**
  - Modified to be more fuel-neutral (expanded to include LNG)
  - Accounts for new market improvements and FERC clarity of generator obligations

24

Three Major Capacity Market Enhancements

- Three recent FERC orders help address performance challenges

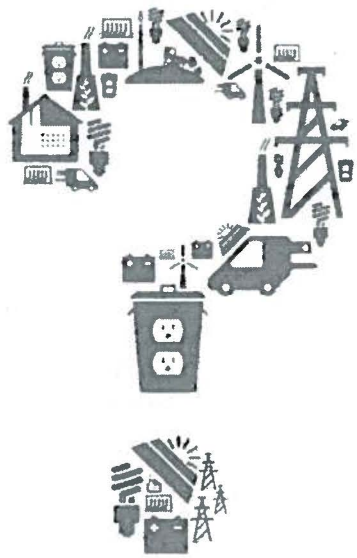


1. **Pay for Performance**
   - Capacity payments during stressed system conditions will be closely tied to performance
   - Energy market prices will be increased to reflect scarcity conditions
2. **Sloped demand curve**
   - Smoothes the boom-and-bust cycle of investment when the region is either just short, or just long, on capacity
   - Seven year price 'lock in' for new resources to incent new entry
3. **Improved zonal modeling**

Conclusions

- Growing dependence on natural gas for power generation is the highest-priority strategic risk for New England
- Region can expect to see additional wind, energy efficiency, and solar added to the system over the next decade
- Retirements of older oil and coal units have begun
- Vast majority of proposed power plants are natural gas
- Changes to ISO's electricity markets will strengthen resource performance and seek the most economic market solutions, but these changes alone won't spur long-term investment in infrastructure
- The region needs to find a way forward to secure the natural gas infrastructure it needs to ensure a reliable electric system

Questions



Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-005 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Please supply the minimum monthly fuel inventory requirements for 2013 for:
a. Coal at Merrimack Station
b. Coal at Schiller Station
c. Wood chips at Schiller station
d. Oil at Newington Station.

Response:
In order 24,498 - The commission discontinued the longstanding practice of maintaining specific coal inventory requirements for PSNH, in favor of a commitment by PSNH to make monthly reports to Staff and to the OCA of fossil fuel costs and coal inventory.

The table below summarizes targeted minimum inventory levels for the requested fuels and locations.

Location-Fuel	Inventory Levels	Reference
a. Merrimack Station - Coal	148,500 tons	Minimum coal inventory target level as reported on monthly filing
b. Schiller Station - Coal	36,000 tons	Minimum coal inventory target level as reported on monthly filing
c. Schiller Station - wood	~10 days	Consistent with the design and available storage lay down area
d. Newington - Oil	~10 days	Newington's dual fuel capability provides additional flexibility for lower oil levels

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-006 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White, Michael L. Shelnitz

Request:
Reference White testimony, Bates page 44, lines 1 through 4. Please show where capacity credits for non-utility IPP's and Hydro Quebec were credited to energy service.

Response:
Capacity credits for non-utility IPP's and Hydro Quebec are included as part of the amounts on the "Capacity Costs" line on MLS-4, Page 7, Line 11.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-007 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, Bates page 44, line 31 through Bates page 45, line 5. Please supply a table that shows FTR's by unit (Merrimack, Schiller and Newington) by month.

Response:
Please see the response to Q-Staff 1-015 in the this docket, specifically page 2 of 3.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-008 **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **Frederick White**

Request:
Reference White testimony, Bates page 45, lines 3 through 5. Please explain the reasons for the unusual congestion costs referenced for September and December.

Response:
Price separation among various locations on the system (congestion) is affected by constantly changing system topology, including load levels, generation dispatch and outages, and transmission configurations, limits, and outages. Below are explanations from ISO-NE Weekly Markets Reports identifying transmission constraints which resulted in unusual day-ahead price separation over certain time periods during September and December, 2013:

September, 2013:

- From Tuesday through Thursday, September 10-12, elevated pricing at the Hub was caused by multiple binding constraints on the system due (in part) to the planned outages along the two parallel lines, A127 (Harriman-Webster Street) and B128 (Montague Tap-Webster Street).

The elevated price at the hub, relative to the NH load zone, increased the negative congestion on the MA hub to NH zone FTR path PSNH had purchased to move bilateral purchases at the hub to its NH load.

December, 2013:

- On Sunday, December 1, price separation across the control area was caused by a binding constraint on the New England West-East Interface due (in part) to the planned outage of the 336 (Blackstone-Bellingham) line, and a binding constraint on the C129N-3 (Depot Tap-Milford) line upon the contingent loss of the W_Medway 103 breaker.
- On Monday, Tuesday, Saturday, and Sunday, December 2, 3, 7, and 8, price separation across the control area was caused by a binding constraint on the New England West-East Interface due (in part) to the planned outage of the 336 (Blackstone-Bellingham) line.
- On Wednesday and Thursday, December 11-12, price separation across the control area was caused by a binding constraint on the New England West-East Interface due (in part) to the aforementioned planned outage of the 336-2 line.
- On Monday, Tuesday, Wednesday, and Saturday December 16, 17, 18, and 21, price separation across the control area was caused by a binding constraint on the New England West-East Interface due (in part) to the planned outage of the 336-2 (Bellingham Tap-West Medway) line.

The congested West-East interface elevated prices at the Merrimack and Schiller nodes, relative to the NH load zone, and increased the negative congestion on the generation nodes to NH zone FTR paths PSNH had purchased to move generation at the nodes to its NH load.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-009 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference White testimony, Bates page 46 line 1 through 5. Please explain PSNH's dispatch decisions in more detail.

Response:
In addition to the reference cited, other portions of testimony provide additional explanations for dispatch decisions. Refer also to White testimony, Bates page 45 lines 22 through 24, and Bates page 46 line 13 through Bates page 47 line 12. PSNH also offers the following regarding dispatch decisions:

PSNH establishes the variable costs of generating energy from its resources based on information provided by the generating stations and from the fuels procurement group; which includes unit operating characteristics (such as heat rate, and start-up and no-load costs), the operational status of the units, the costs of fuels and fuel activities (such as handling, additives, and residual expenses), and variable maintenance and emissions costs. Specific to natural gas fuel, the fuels group contacts the natural gas supplier for inter-day prices, and may adjust the price to cover the potential for higher intra-day pricing. This information is used as the basis for a gas-fired offer price for Newington. The economic dispatch offer for Newington is either a natural gas price or oil price (or a combination of the two fuels). All of this information above is used to calculate the various generation offer prices that are submitted to ISO-NE. For PSNH's nine hydro generation facilities the PSNH hydro group provides next day generation dispatch schedules, which are accordingly scheduled with ISO-NE. PSNH evaluates the expected economic operation of its units by comparing dispatch costs to forward energy market prices (based on quotations from energy brokers, publically available market price information, and recent energy market clearing prices), which leads to a determination of the surplus or shortfall position of the portfolio of ES load and resources.

Below are some typical plans discussed as PSNH's units are self-scheduled or economically offered into the ISO-NE electricity market.
<u>Merrimack Station</u>
Plan: Based on forward energy market prices indicating that clearing prices will be close to or above dispatch prices for a number of days, ensuring start costs are amortized over many hours of operation, self-schedule MK1 and MK2 at minimum output level in order to cover ES customer load needs.
Plan: After being economically dispatched by ISO-NE, determine to self-schedule MK1 and/or MK2 for subsequent days because forward energy market prices indicate that clearing prices will be close to or above dispatch prices.

Plan: Because forward energy market prices indicate that clearing prices will be below MK1 and MK2 dispatch prices, offer the units on economics and purchase energy with short term bilateral and/or spot market energy purchases instead of self-scheduling at minimum output to serve load.

Schiller Station – Units 4 & 6

Plan: Offer the units to ISO-NE for dispatch on economics. The ISO will dispatch the unit either; 1) based on economics (i.e. generation dispatch price is at or below the spot market energy clearing price), or 2) based on the need for a generation unit to ensure adequate operating reserves/reliability.

Newington Station

Plan: Regardless of economics Newington is determined to be not needed to serve load, so Newington is offered to ISO-NE for dispatch on economics. The ISO will dispatch the unit either; 1) based on economics (i.e. generation dispatch price is at or below the spot market energy clearing price), or 2) based on the need for a generation unit to ensure adequate operating reserves/reliability.

In addition, please refer to Q-CLF 1-005 and 2-005 in this docket which provides information on dispatch decisions by day and by dispatch period, respectively, for 2013.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-010 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 55, lines 14 through 16. Please provide the reasons that PSNH hydro facilities provided approximately 10% more generation in 2013 versus 2012.

Response:
Please see OCA 1-016. As noted in that response, each facility produced more energy in 2013 than 2012, primarily due to heavy precipitation in April, June and July.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 | **Date of Response: 11/07/2014**
Request No. STAFF 2-011 | **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **William H. Smagula**

Request:
For all PSNH outages listed in Outage Reports and all Planned Maintenance Outages, please describe the PSNH approach to the use of overtime to reduce outage time and costs to customers.

Response:
Generation prioritizes the cost effective management of both forced and planned outages. To determine a lower cost option for performing outages, the use and associated cost of overtime is compared to the cost of replacement power. PSNH works with Energy Supply personnel to monitor customer load and the energy market. During periods of low electrical demand and low power market prices, PSNH adjusts the outage duration to use less overtime. While this practice may extend the duration of the outage, the total outage expense is minimized, by avoiding the associated overtime costs. Conversely, when the energy market prices are high, overtime will be strategically used to shorten the duration of the outage and reduce replacement power costs, again focused on obtaining the lower overall cost for customers.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 | **Date of Response: 11/07/2014**
Request No. STAFF 2-012 | **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 88. Please elaborate on the PSNH policy of keeping motor shaft spares on hand. If not kept on hand, please explain why not.

Response:
The shaft referenced on Bates page 88 is a fan shaft, not a motor shaft. The Forced Draft fan-motor assembly on MK1 is a huge piece of equipment which would be as big as a large room of a house. The fan wheel is shrunk-fit and keyed to its shaft, so to work on the shaft, the entire fan wheel/shaft element requires removal from its housing. This involves removal of portions of the fan enclosure, bearing assemblies, damper control devices, etc., which contributes to the duration of this work. Also, the fan has to be cool in order to ensure the shaft does not develop a bow.

Regarding the shaft specifically, it is 10-foot long, 11 inches thick at the fan, and 6 inches thick at the outer bearing mounts. Because of the unique and expensive design of large fan shafts and since industry experience does not illustrate these shafts generally have major problems, we do not carry an inventory of these very expensive and unique items. In this case, the shaft was repaired and re-machined to original dimensions.

However, when we have had the need to make occasional shaft repairs or replacements, we do either carry spares or have the round stock on hand to make shafts. This is typically done with vertical pumps such as condensate or cooling water pumps. We also make repairs or replace numerous other shafts and control rod devices on a routine basis due to the machining capability and skills of our Generation Maintenance Shop in Hooksett. When a piece of equipment is replaced, we assess the opportunity to rebuild the replaced item. When a replaced item is rebuilt, the rebuilt item is then put in inventory as a spare.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-013 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 81. After repair, the unit was returned to service in reserve status. Please explain what the PSNH policy when returning a unit to service regarding. For example, does the Company attempt to bring the unit on line or conduct a mock start up?

Response:
When a unit is out of service due to equipment problems and subsequently returned to being available for operation, energy market prices at that time and as projected into the next day or two will usually dictate if the unit is to be brought online immediately or not. If the unit is not brought online, an assessment is made of both the repairs recently completed and any other equipment known to have operational or reliability concerns. Starting up the unit may occur if it is determined that such action is the only way to ensure a successful future startup or reliable operation. Starting up could mean just operating one piece of equipment, one system, or a larger scope up to and including putting fires into the boiler, phasing of the unit online and even picking up load. Decisions to put fires in the boiler and phase the unit are less frequent since our experience and competencies with repairs will typically provide strong confidence the units are ready to operate. Costs and benefits to customers are always considered in making such decisions, and the preference is to not incur any additional customer costs, such as consuming fuel, if reasonably possible.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-014 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 64. Please explain the transmission constraint (transmission equipment beyond the 1st substation) imposed on PSNH unit MK-1, Outage B in full detail.

Response:
Prior to this outage Merrimack 1 was available and in economic reserve status. On April 16 at 0800, the unit became restricted to zero megawatts output due to transmission work on the #1 Bus and the H137 Line Rebuild Project. This transmission work required Merrimack # 1 not operate in order to safely pull line conductors over the #1 Bus. Station management utilized this transmission outage to perform inspection work on key equipment with no additional outage time or customer exposure. Specifically, 1B forced draft fan thrust bearing had under certain loads experienced axial movement of the fan rotor. To perform this inspection the unit was declared unavailable. Upon completion of the transmission line work and the fan inspection, the unit was returned to an available status and remained in economic reserve.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-015 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 68, Newington Outage A. Please explain the Transmission System limitation imposed on PSNH generation in full detail.

Response:
On January 22, 2013, ISO NE requested the Newington unit phase on January 23 at 0330. The unit came on line as requested. At 0811 Newington personnel received a directive from the ESCC (who had received the directive from ISO) to arm the special protection scheme (SPS) for the 326 line at the Newington substation; and the scheme was activated at 0824. This action was requested to allow increased power transfers across the New Hampshire border while continuing to allow the Newington unit to operate; and thus best managing transmission restrictions caused by transfer levels and congestion.

According to ESCC logs, at 1102 the SPS associated with the 326 line caused the Newington unit to trip (unit tripped 1056 per Generation GADs). At 1122 ISO-NE allowed the SPS on the 326 line to be disarmed. The Newington unit received permission to restart; and the unit came back on line at 1517. Post-event investigation determined that the trip was caused by high noise levels on the telephone circuit; the issue has been corrected.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 | **Date of Response: 11/07/2014**
Request No. STAFF 2-016 | **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **William H. Smagula**

Request:
Reference Smagula testimony, Bates page 98. Please clarify which availabilities are being discussed: Unit availabilities or equivalent availabilities. In addition, please supply annual values by unit on the same basis as the table.

Response:
Bates page 98 provides equivalent availability factors by unit by month. Annual values by unit are included in the response to Staff 01-018 and shown below.

Annual Equivalent Availability	
Unit	2013
MK1	88.1%
MK2	69.1%
NT	96.6%
SR4	95.7%
SR5	91.9%
SR6	88.2%
Aggregate	85.7%

Note:
Some outages were extended to reduce overtime costs during low priced periods, e.g. Merrimack 2.
Longer outage durations will reduce a unit's availability

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-017 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 99. Please explain the difference between fossil system weighted EAF and equivalent availability.

Response:

The graph on Bates page 99 provides an overall equivalent availability factor for PSNH's Fossil fleet (the 6 units - MK1, MK2, NT, SR4, SR5 and SR6) by averaging the units' annual equivalent availabilities.

The annual value shown on the graph is the weighted average of the individual units' equivalent availability factors. The weighted average considers the capacity of the unit as well as its availability and is calculated by multiplying each unit's annual equivalent availability factor times the unit's claimed capability. The sum of those values is divided by the total claimed capability of the 6 units and termed PSNH Fossil System Weighted EAF.

As discussed in Staff 01-019, the term equivalent availability is an industry standardized metric, and is used to represent the portion of hours that a unit is available to be dispatched at full capacity. Equivalent availability is recognized by the North American Electric Reliability Corporation (NERC) and other regional entities such as ISO-NE. The NERC approved equation to calculate the Equivalent Availability Factor is:

EAF = [(Available Hours – Equivalent Unit Derated Hours) * 100] ÷ Period Hours.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-018 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Smagula testimony, Bates page 100. Please explain why the heat rate for MK-2 rises when its capacity factor also rises.

Response:
There are varied reasons which result in a higher capacity factor for a unit. One scenario is when a unit has long, multi-day periods of continuous operation with minimal derates and fewer start-ups and shut-downs. This would likely result in a higher capacity factor for the unit as well as a lower ("better") heat rate due to fewer inefficient periods of unit operations such as derates, start-ups and shut-downs.

However, a higher capacity factor can also be the result of more operation at lower, less efficient operational loads when a unit operates over a wider range in support of system needs. More operation at less-than-full load can increase the unit's overall capacity factor; however, the lower load operation is less efficient and results in a higher ("worse") overall heat rate.

Also when efficiency equipment such as high pressure heaters are out of service, the unit heat rate will increase. In 2013, MK2 experienced a period when the high pressure heaters were out of service and the unit remained in service. Finally, additional station energy needs to operate newly installed electrical equipment added to the station load at a facility will result in a higher heat rate as compared to similar past operation.

All of these factors contribute to a higher MK2 capacity factor with a higher heat rate.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-019 **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **Michael L. Shelnitz**

Request:
Reference Staff Data Request 1-05. Please explain why accounts 565LR, fossil hydro rental, Smith, and Garvins Falls accounts are negative.

Response:
565LR is negative because it includes a $184K disgorgement payment from ISO New England, per FERC Docket IN 12-11-000. The disgorgement was agreed to be paid by Rumford Paper Company, who had been investigated for fraudulent conduct in its participation in ISO-New England's Day-Ahead Load Response Program. Per that docket, ISO-New England was required to make a disbursement to regional network load responsible for the load response program costs from July 2007 to February 2008. This refund was received in the month of June 2013 and was larger than the combined Load Response costs for all of 2013 thus making total 565LR negative for the year.

Fossil Hydro Rental is negative because these are revenues from third party telecommunication installations at the fossil/hydro plants.

Smith Hydro PTCs are federal tax credits. These tax credits are negative because they represent a benefit received by the unit for certain efficiency improvements it made. The value of this benefit is credited back to customers through the ES rate.

The Garvins Falls credit is for the amortization of a gain made from a sale/lease-back transaction involving this entity.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-020 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Staff Data Request 1-17. Please supply annual information for the graph presented. Please also state what availability values are presented in this response.

Response:
The table in response to Staff 01-017 (shown here) reflects an analysis of the year 2013 which identifies the 30 highest-priced market days and provides the equivalent availability for each unit and the fleet during those 30 highest-priced market days. A 2013 annual equivalent availability for each of the units is provided in Attachment WHS-3, response to Staff 1-018, response to Staff 2-016 and Staff 2-021.

Equivalent Availability
2013 - 30 highest-priced market days

Unit	30-Day Availability (Percent)			
	2010	**2011**	**2012**	**2013**
MERRIMACK 1	99.2	99.3	99.6	99.7
MERRIMACK 2	90.7	89.8	99.5	98.4
NEWINGTON 1	95.2	96.2	99.6	99.6
SCHILLER 4	97.4	99.1	96.6	97.8
SCHILLER 5	80.5	96.2	96.3	99.0
SCHILLER 6	98.6	99.9	100.0	96.0
PSNH FLEET	93.8	94.6	98.2	98.3

Data from 2010, 2011, and 2012 are provided from prior reconciliation dockets

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-021 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference Staff Data Request 1-18. Please verify that the values are accurate for the units by year and that the aggregate values can be considered system values.

Response:
The values shown below from Staff 1-18 are consistent with the units' GADS performance data. The Aggregate value is the weighted average of the units' availabilities.

Annual Equivalent Availability				
	2010	2011	2012	2013
MK1	85.4%	79.8%	86.3%	88.1%
MK2	86.8%	84.0%	74.5%	69.1%
NT	96.2%	93.7%	95.3%	96.6%
SR4	87.1%	89.6%	83.6%	95.7%
SR5	86.5%	83.9%	91.6%	91.9%
SR6	97.0%	91.8%	90.2%	88.2%
Aggregate	91.0%	88.1%	86.4%	85.7%

Note:
Some outages were extended to reduce overtime costs during low priced periods, e.g. Merrimack 2.
Longer outage durations will reduce a unit's availability.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-022 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Reference OCA Data Request 1-18. Please include Schiller Station in your response.

Response:
Regarding OCA 1-018, it has been noted that the filed version of the response truncated the table. Below is the full table intended to be filed in OCA 1-018.

Environmental Items	Merrimack ($000)	Newington ($000)	Schiller ($000)	Hydro/Staff ($000)
NH-DES Emissions Fees, etc.	929	102	492	
Continuous Monitoring Equipment and associated work	222	55	218	
Hazardous Waste	3	13	1	
Environmental Compliance and other regulatory compliance	2109	234	1077	1970

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Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-023 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Reference OCA Data Request 2-10. Please explain in detail how the PSNH software does not provide value to NU or its other subsidiaries.

Response:
The software has no practical application at the NU parent level. The primary focus of development, maintenance, and utilization of the software (which are Excel spreadsheets) is for management of PSNH's ES portfolio of load and resources. In a minor way NU's other operating subsidiaries (may) flow a small amount of bidding and scheduling information through the spreadsheets. Development and maintenance are performed by the same personnel who use the spreadsheets and their time is appropriately allocated among all operating subsidiaries.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-024 **Page 1 of 1**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Please make available the following documents for review in Manchester, NH.

a. Annual Overhaul Reports for the units a t Merrimack, Newington, and Schiller which has planned maintenance in 2013.
b. 2013 capital expenditures and plans for each PSNH unit.
c. 2013 O&M expenditures and plans for each PSNH unit.
d. Stability studies for Jackman and Cannan with and without relay operation evaluations.

Response:
PSNH will make available for the NHPUC Staff and Staff consultant all available documents at a time to be scheduled for review at Energy Park.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-025 **Page 1 of 12**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
Please supply a copy of the PSNH reliability criteria used in the design of the PSNH 34.5 kV system.

Response:
A copy of ED-3002 "Distribution System Planning and Design Criteria Guideline" is attached.

ED-3002 Distribution System Planning and Design Criteria Guidelines

I. PURPOSE

To establish guidelines to assist in planning and designing a distribution system that meets customer needs and regulatory requirements.

II. AREAS/PERSONS AFFECTED

This procedure applies to:

- Energy Delivery - system planning and design personnel

III. POLICY

It is the policy of PSNH:

A. To provide a reliable, cost effective, and efficient distribution system to meet customer needs while meeting regulatory requirements.

B. To insure adequate power distribution capacity during all times including normal summer and winter **peak load conditions**.

C. To examine **contingent** outages of substation equipment and circuits to identify areas subject to risk.

D. To insure a consistent approach to the planning for expansion and enhancement of the local area system.

E. To use sound engineering judgment when recommending construction for long term solutions when the design guidelines are exceeded.

F. To design the 34.5 kV distribution system to maximize performance and minimize cost by adhering to design criteria as outlined in this procedure.

IV. DEFINITIONS

Throughout the guideline, defined terms appear in bold and have a specific definition, which can be found in Appendix A.

V. OVERVIEW

This Operating Procedure provides distribution system design and planning guidelines for the 34.5kV and below systems. The 115kV and 345kV transformation to 34.5kV is included.

It is the intent of this guideline to promote the development of long term system solutions based on sound engineering and financial judgment. Short-term solutions **shall** be utilized only when prudent in the long-term planning of the system.

VI. PERIODIC REVIEW OF GUIDELINE

The Procedure Owner is responsible for maintaining this guideline and keeping current with good engineering design practices. The Procedure Owner for this Energy Delivery Procedure is the Manager of System Planning and Strategy or designee.

Annually, the Procedure Owner **shall** review design guideline for conformance to standard engineering practices and industry criteria to determine if the guideline **shall** be revised, rewritten, or cancelled.

As required, the Procedure Owner **shall** recommend changes to the Director of Energy Delivery. If approved by the Director, the Procedure Owner **shall** change the Procedure in accordance with AP-2001 Writing and Publishing Procedures.

VII. GUIDELINES

A. Normal Operation

Normal Operation is how the system is designed to operate during **peak load conditions**. The system **shall** be designed such that during normal operation no switching is required to maintain equipment within its normal thermal ratings.

For design purposes, the system **shall** be capable of serving native PSNH load during **peak load conditions** without relying on the facilities of customers or neighboring utilities unless in accordance with a specific contract.

Areas that may require system enhancements for Normal Operation are identified when **distribution power transformers** are loaded to within 85% of their **TFRAT** (transformer rating). Those areas will be specifically evaluated in order to determine proper budget and construction schedule such that system enhancements are in place the year prior to distribution power transformers exceeding their TFRAT. Refer to ED-3023, Appendix B, for guidance.

No load loss **shall** be permitted under normal Summer or Winter **peak load conditions**.

Each **system generator** will be modeled on and off during **peak load conditions** to assure adequate supply to the area. One generating unit at a time or the largest unit at a facility will be removed from the system model to examine the effect.

Distribution circuits to which **Independent Power Producers (IPP)** are connected will be designed to carry load in accordance with IPP contractual guidelines. IPP will be modeled on, off, and at varying power factors in accordance with the generator capabilities.

The use of **dispatchable peak shaving generation** as defined in Appendix A is acceptable for managing peak load issues in specific locations to manage capital investments on the system.

Known common supply conditions for generation facilities will be considered for impact on the system. This includes the effect of drought on all hydro-electric generation in an area, common fuel/gas supplies for multiple generation units, air emission standard constraints, etc.

B. Contingent Operation

Contingent Operation is the result of the failure of equipment during **peak load conditions**. The following **contingencies shall** be examined for system impact during **peak load conditions**.

1. Loss of 34.5 kV line breaker.
2. Loss of a **distribution power transformer.**
3. Loss of radial transmission lines.
4. Loss of non-radial transmission lines.
5. Loss of **dispatchable peak shaving generation**.

Each **system generator** will be modeled on and off during Contingent Operations. The reliability and ability to utilize the generation during **peak load conditions** will be examined in the event that a specific generating facility supports the system during Contingent Operation.

During Contingent Operation some loss of power to customers (load isolation) will be accepted at the time of **peak load conditions**. The following guidelines **shall** be used to determine the level of severity and need for construction:

1. The load isolation does not exceed 30 MVA and the duration of the outage does not exceed 24 hours.
2. **Load block transfers** on the 34.5kV system are an acceptable means for reducing exposure and typically **shall** not exceed three.

This design criteria recognizes that most PSNH transformers can be backed up by a mobile transformer or faulted circuits can usually be repaired in less than twenty-four hours unless under very adverse conditions.

C. Voltage Regulation

Power delivery systems **shall** maintain acceptable voltage levels to all customers under the conditions for which the power delivery system is designed. This voltage **shall** be maintained during all loading periods in addition to Contingent Operations.

Acceptable primary 34.5 kV bus voltage levels modeled **shall** be maintained at all locations under Normal and Contingent Operations for all load levels. Planning for these operations **shall** recognize where 34.5 kV load is regulated and unregulated (not including the 34.5 kV transformer LTC at **Bulk Power Facilities** as regulation):

1. **Regulated Load:** The acceptable voltage range is 95 – 105% under normal conditions. During **contingencies** voltage levels may drop no lower than 92% in a localized area. Where a customer is responsible for supplying its own voltage regulation, the acceptable voltage range is 90% - 110%.

2. **Unregulated Load:** The acceptable voltage range is 97.5 - 105% under normal conditions. During **contingencies** voltage levels may drop no lower than 95% in a localized area.

The voltage at customer service terminals **shall** not exceed those minimum and maximum values as outlined in the New Hampshire Code of Administrative Rules PUC 304.02 Voltage Variation, revised October 2005, or latest revision thereof.

NOMINAL VOLTAGE	MINIMUM VOLTAGE	MAXIMUM VOLTAGE
120	114	126
240/120	228/114	252/126
208Y/120	198Y/114	218Y/126
240	228	252
480Y/277	456Y/263	504Y/291
480	456	504
600	570	630

D. Power Factor

The power factor during normal operation **shall** be maintained at levels which limit reactive current flow on the system and maintain proper voltage. Additionally, PSNH **shall** strive for a **load power factor** which satisfies ISO-NE Operating Procedure No. 17. This contains the methodology for developing the ranges of acceptable **load power factor** at the point of interconnection to the transmission system.

PSNH **shall** strive to maintain unity (1.00) power factor at 34.5kV line breakers during **peak load conditions**. Substation capacitors at 34.5kV and above **shall** be designed as required primarily to compensate for transformer losses in accordance with OP17.

The consideration of power factor correction guidelines **shall** include all load levels and **contingent** operation. The 34.5kV and below circuits **shall** be modeled and designed to maintain distribution power factor (p.f.) ranges in accordance with the following table:

Load Level(% of Peak)	Minimum p.f.	Maximum p.f.
80-100%	.98 lag	1.00
65-80%	.95 lag	1.00
up to 65%	.94 lag	1.00

The location, control device, and size of capacitor banks **shall** be determined in accordance with good engineering judgment and operation of the system.

E. System Protection

Except for transformers and buses at **bulk distribution facilities**, distribution primary elements **shall** normally be supplied with one system of protection, although remote devices may provide some inherent backup. Transformers and buses at **bulk distribution facilities shall** normally be supplied with two systems of protective relays.

Protective provisions **shall** be included with all distribution system designs to limit exposure to the public, personnel, and equipment from abnormal events and conditions. Control provisions **shall** be included with all distribution system designs to allow the system to operate in a manner consistent with the intent of planning and operating criteria. Protection and Controls Engineering **shall** be included early in the system planning process such that the related protection and control designs may be designed to support all intended system operating modes. The approach will avoid loading, operating, and/or protection limitations, which could otherwise prevent the primary system from providing the desired support during critical periods.

The intent of system protection design guidelines is that the above **shall** apply to new installations. Existing equipment **shall** be reviewed, as appropriate, and brought into conformance with these guidelines where prudent.

F. Equipment Loading Limits

Substation Transformers: The Normal limit, computer calculated **TFRAT** rating, is the maximum equipment load rating without incurring loss of life above the design loading limit, adjusted for ambient conditions. Transformer loading under Normal and Contingent Operation **shall** not exceed the **TFRAT** ratings.

Conductors: Conductors **shall** be rated for Normal and Contingent Operation. Under Normal Operation the conductors will be loaded within the normal rating limit of the conductors. The normal rating limit is the maximum equipment loading without incurring loss of life above the design-loading limit, adjusted for ambient conditions. During Contingent Operation the conductors will be within the emergency-rating limit of the conductors. The emergency-rating limit may involve loss of life or loss of tensile strength and is for Contingent Operation only. Any normal rating limit exceeded under Normal Operation **shall** be resolved by making prudent system changes or system enhancements to get the conductor within normal ratings. Any emergency-rating limit exceeded under Contingent Operation will result in switching, load isolation, and/or construction.

G. Economic

Economic evaluation of various alternatives will be made using the 'revenue requirements' method, or other economic evaluation methods as directed by management. Various alternatives **should** be projected to the end of their useful lives for making comparisons. System Planning and Strategy **should** determine operating and maintenance costs and useful life for purposes of economic studies.

H. Load Forecasts

Short and long-range load forecasts for the Company can be obtained from the System Planning and Strategy Department. These engineers will develop forecasts for localized planning based on load growth history and field input while working within the confines of the Company forecasts.

I. Substation Design

1. Transformers with secondary voltages of 34.5kV and below **shall** have secondary breakers. Each circuit fed from the substation **shall** have a designated circuit breaker.

   EXCEPTION: If only one circuit is fed from the substation, the transformer breaker may be utilized as the circuit breaker. Provisions **shall** be made for circuit breakers for future circuit additions.

2. Bus tie breakers **shall** be incorporated into substations with two or more transformers.

a. Existing substations **shall** be modified when major construction takes place in the substation or a specific project is proposed for this purpose.

b. Existing single transformer substations **shall** be designed to include the bus tie breaker when a second transformer is added.

c. New substations **shall** be designed with provisions for a future bus tie breaker if only one transformer is being constructed.

d. The bus tie breaker **should** be operated normally open at the substation.

3. Standard wire size for substation take-off construction **should** not exceed 477 kcmil ACSR.

J. 34.5 kV Circuit Design

1. Circuits looped between two substations

a. Standard wire size for all backbone circuits **shall** be 477 kcmil ACSR.

b. Looped circuit may have a normally open point between the two substations, in which case:
   i. Each circuit **should** be limited to a peak load of 400 amps at each substation.
   ii. The total load on the looped circuit(s) **shall** be no greater than 800 amps.

2. Three Phase Radial Circuits

a. Standard wire size for a backbone radial circuit **should** be 477 kcmil ACSR. If the potential for the radial circuit to become part of a loop system is greater than 10 years, 1/0 ACSR is an acceptable wire size.

b. Three phase 34.5 kV radial circuits consisting of primarily residential load **should** be limited to:
   i. 200 amps OR;
   ii. 2500 customers (per **DSEM** 02.303) OR;
   iii. 6 miles of three phase backbone (per **DSEM** 02.101) OR;
   iv. 50 miles of line for the entire circuit

c. An alternate/additional source to the radial circuit **should** be provided when any of the constraints in 2.b.i.-iv. above are exceeded. A separate source is preferred if available.

3. Single phase circuits

a. Standard wire size for a single phase circuit **should** be 1/0 ACSR.

b. A single phase circuit design **should** incorporate a recloser to protect a circuit with over 200 customers instead of a fuse.

c. Load **shall** be limited to 70 amps, maximum.

K. Conversion to 34.5kV

1. Circuits **shall** be reconductored if existing conductor being converted is smaller than 1/0 copper.

VIII. APPENDIX

Appendix A – Definitions
Appendix B - References

IX. ED-3002 REVISION HISTORY

Revision Number	Date	Reason
Rev 0	01/10/03	Original issue
Rev 1	10/04/05	
Rev 2	06/27/06	
Rev 3	06/28/09	Revised to incorporate distribution peak shaving – DCI Team recommendations
Rev 4	09/12/11	Correction of section VII, A.

A. **Bulk Distribution Facilities** - Any distribution facility with a primary voltage 115 kV or greater.

B. **Contingency (or Contingencies)** - A failure of a single piece of equipment, which may require a reconfiguration of the system to restore load to customers. This includes a **distribution power transformer**, circuit, or circuit breaker.

C. **Dispatchable Peak Shaving Generation** – Electric power generators located at substations or other strategic locations to manage potentially overloaded transformers at peak load conditions. Examples: Combustion turbines, micro-turbines, reciprocating engines, or any other source of electric power which can be switched on or off as required and under the control of PSNH.

D. **Distribution Power Transformer** - Transformers supplying load at distribution levels including 34.5kV, 12.47kV, 4.16kV, and equivalent voltages.

E. **DSEM** - Northeast Utilities' Distribution System Engineering Manual

F. **Independent Power Producers (IPP)** – Non-PSNH generation interconnected to the PSNH system that meets the FERC definition of being a qualifying facility either by operating as a cogenerator or by producing generation with a renewable fuel source.

G. **Load Block Transfers** - Transfers of load between system areas that can be performed by operation of breakers and switches controlled by or under the direction of PSNH's Electric System Control Center (ESCC).

H. **Load Power Factor** - The **load power factor** is determined by adding real and reactive load at the transformation low side with transformer losses, generation below 115kV, and 115kV capacitors designated for system power factor correction. This methodology is defined in ISO-NE Operating Procedure No. 17.

I. **Peak Load Conditions** - The one-hour annual system and/or area peak MVA load for the season identified.

J. **Regulated Load** – Load that has voltage regulation at a 34.5kV primary voltage beyond the **Bulk Distribution Facility**. The system load is all beyond a PSNH voltage regulated source. Primary metered customers are considered **regulated load** because regulation is their responsibility in accordance with the Tariff.

K. **Shall** – An expression of command requiring conformance.

L. **Should** – An expression of condition which requires consideration but not immediate action.

M. **System Generation** - All generation on the PSNH System.

N. TFRAT Rating - Maximum load on a **distribution power transformer** to utilize its capacity without overheating the equipment and causing damage that will reduce its normal life. **TFRAT** Rating is determined utilizing a computer program at PSNH. System Planning and Strategy maintains these records.

O. Unregulated Load – Load that has no voltage regulation at the 34.5 kV primary voltage beyond a **Bulk Distribution Facility**. The voltage of the system load is not regulated beyond the 34.5 kV point modeled for planning by System Planning and Strategy.

ED-3002 APPENDIX B - REFERENCES

January 2004 - Transmission Reliability Standards for Northeast Utilities

Decmeber 8, 2006 or most recent version - ISO-NE Operating Procedure No. 17 – Load Power Factor Correction

DSEM 02.10 Reliability General

DSEM 02.30 Automatic Sectionalizing Device Guidelines

DSEM 05.30 Contingency Planning

DSEM 10.20 Recloser Guide

DSEM 18.30 Feeders per Substation

ED-3023 - Procedure for Comprehensive System Planning Studies

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 | **Date of Response: 11/07/2014**
Request No. STAFF 2-026 | **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **William H. Smagula**

Request:
Please supply the 20-year monthly mean water flows for the months of June, July, August, and September as supplied to ISO-NE for each hydro station and the amount of run-of-river generation those flows would support.

Response:
PSNH does not provide ISO-NE 20-year monthly mean water flow data. ISO-NE receives water flow data from US Geological Survey (USGS). ISO-NE uses the water flow data to determine non-run-of-river hydro facilities' ratings, but does not use similar data for run-of-river hydro facilities' ratings. PSNH is aware of this river flow data, but does not use it routinely for any station calculations.

REDACTED

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 | **Date of Response: 11/07/2014**
Request No. STAFF 2-027 | **Page 1 of 2**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **Frederick White**

Request:
Please supply a copy of the document used by PSNH for guidance in its supplemental purchases and sales during 2013. If any changes were made in the document from 2012, please explain each.

Response:
Attached is the guidance document. During 2013 the guidance document was updated to reduce the tolerance for an unhedged position during Spring / Fall from 250 MW to 200 MW. Management of the ES portfolio of load and resources is also governed by internal policies and procedures.

* The confidential attachment will be provided to Staff and OCA under separate cover. *

Pursuant to Puc 203.08(d) and RSA 363:28, VI, PSNH provides this response on a confidential basis to the Commission Staff and the Office of Consumer Advocate. PSNH submits that it has a good faith basis for seeking confidential treatment of the documents in this response and that it intends to submit a motion for confidential treatment of the documents prior to the commencement of any hearing in this proceeding.

REDACTED

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-028 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: Frederick White

Request:
Please supply a chronological list of supplemental energy purchases made by PSNH for 2013 . In that list please also show, whether the purchase was:

a. Daily, weekly, or monthly.
b. Peak or off-peak.
c. Type of purchase (7 x 24, etc.).
d. Period of time covered by the purchase.
e. Date purchase was entered into.

Response:
Please see the attached table.

2013 - PSNH Bilateral Purchases for Energy

Year	Month	Delivery Term Start Date	Delivery Term End Date	Type of Term	Peak / Off-Peak	Type of Purchase	Number of Delivery Days	Trade Date
2013	1	1/9/13	1/11/13	Daily	Peak	5X16	3	1/8/13
		1/12/13	1/13/13	Daily	Subset of Off-Peak	2X16	2	1/10/13
	3	3/21/13	3/21/13	Daily	Peak	5X16	1	3/21/13
		3/22/13	3/22/13	Daily	Peak	5X16	1	3/21/13
		3/23/13	3/24/13	Daily	Subset of Off-Peak	2X16	2	3/22/13
		3/30/13	3/31/13	Daily	Subset of Off-Peak	2X16	2	3/27/13
		3/30/13	3/31/13	Daily	Subset of Off-Peak	2X16	2	3/28/13
	4	4/1/13	4/30/13	Monthly	Peak	5X16	22	3/26/13
		4/1/13	4/30/13	Monthly	Peak	5X16	22	3/27/13
		4/1/13	4/5/13	Weekly	Peak	5X16	5	3/27/13
		4/6/13	4/7/13	Daily	Subset of Off-Peak	2X16	2	4/5/13
		4/13/13	4/14/13	Daily	Subset of Off-Peak	2X16	2	4/12/13
		4/15/13	4/15/13	Daily	Peak	5X16	1	4/12/13
		4/20/13	4/21/13	Daily	Subset of Off-Peak	2X16	2	4/19/13
		4/24/13	4/26/13	Daily	Peak	5X16	3	4/22/13
		4/27/13	4/28/13	Daily	Subset of Off-Peak	2X16	2	4/26/13
	5	5/1/13	5/31/13	Monthly	Peak	5X16	22	3/26/13
		5/1/13	5/31/13	Monthly	Peak	5X16	22	4/4/13
		5/4/13	5/5/13	Daily	Subset of Off-Peak	2X16	2	5/3/13
		5/6/13	5/10/13	Weekly	Peak	5X16	5	5/2/13
		5/11/13	5/12/13	Daily	Subset of Off-Peak	2X16	2	5/10/13
		5/18/13	5/19/13	Daily	Subset of Off-Peak	2X16	2	5/17/13
		5/25/13	5/27/13	Daily	Subset of Off-Peak	2X16	3	5/24/13
		5/25/13	5/27/13	Daily	Subset of Off-Peak	2X16	3	5/24/13
	6	6/6/13	6/6/13	Daily	Peak	5X16	1	6/5/13
		6/7/13	6/7/13	Daily	Peak	5X16	1	6/6/13
		6/10/13	6/10/13	Daily	Peak	5X16	1	6/7/13
		6/11/13	6/11/13	Daily	Peak	5X16	1	6/10/13
		6/12/13	6/12/13	Daily	Peak	5X16	1	6/11/13
		6/13/13	6/14/13	Daily	Peak	5X16	2	6/11/13
		6/15/13	6/16/13	Daily	Subset of Off-Peak	2X16	2	6/14/13
		6/17/13	6/21/13	Weekly	Peak	5X16	5	6/14/13
		6/22/13	6/23/13	Daily	Subset of Off-Peak	2X16	2	6/19/13
		6/24/13	6/24/13	Daily	Peak	5X16	1	6/21/13
		6/27/13	6/27/13	Daily	Peak	5X16	1	6/26/13
		6/28/13	6/28/13	Daily	Peak	5X16	1	6/26/13
		6/29/13	6/30/13	Daily	Subset of Off-Peak	2X16	2	6/27/13
	7	7/1/13	7/1/13	Daily	Peak	5X16	1	6/28/13
		7/2/13	7/2/13	Daily	Peak	5X16	1	7/1/13
		7/5/13	7/5/13	Daily	Peak	5X16	1	7/3/13
		7/5/13	7/5/13	Daily	Peak	5X16	1	7/3/13
		7/6/13	7/7/13	Daily	Subset of Off-Peak	2X16	2	7/3/13
		7/6/13	7/7/13	Daily	Subset of Off-Peak	2X16	2	7/3/13
		7/24/13	7/24/13	Daily	Peak	5X16	1	7/23/13
		7/25/13	7/26/13	Daily	Peak	5X16	2	7/23/13
		7/25/13	7/26/13	Daily	Peak	5X16	2	7/23/13
		7/27/13	7/28/13	Daily	Subset of Off-Peak	2X16	2	7/26/13
		7/29/13	7/29/13	Daily	Peak	5X16	1	7/26/13
		7/31/13	7/31/13	Daily	Peak	5X16	1	7/30/13
		7/31/13	7/31/13	Daily	Peak	5X16	1	7/30/13
	8	8/1/13	8/2/13	Daily	Peak	5X16	2	7/30/13
		8/3/13	8/4/13	Daily	Subset of Off-Peak	2X16	2	8/1/13
		8/3/13	8/4/13	Daily	Subset of Off-Peak	2X16	2	8/1/13
		8/5/13	8/5/13	Daily	Subset of Off-Peak	5x15	1	8/2/13
		8/6/13	8/6/13	Daily	Peak	5X16	1	8/5/13
		8/10/13	8/11/13	Daily	Subset of Off-Peak	2X16	2	8/8/13
		8/12/13	8/16/13	Weekly	Peak	5X16	5	8/8/13
		8/17/13	8/18/13	Daily	Subset of Off-Peak	2X16	2	8/16/13
		8/19/13	8/23/13	Weekly	Peak	5X16	5	8/9/13
		8/24/13	8/25/13	Daily	Subset of Off-Peak	2X16	2	8/23/13
		8/26/13	8/26/13	Daily	Peak	5X16	1	8/23/13
		8/28/13	8/30/13	Daily	Peak	5X16	3	8/26/13
	9	9/1/13	9/30/13	Monthly	Hybrid	7X16	30	6/4/13
	10	10/1/13	10/31/13	Monthly	Hybrid	7X16	31	6/4/13
	11	11/1/13	11/30/13	Monthly	Hybrid	7X16	30	6/4/13
		11/21/13	11/22/13	Daily	Peak	5X16	2	11/19/13
	12	12/2/13	12/6/13	Weekly	Peak	5X16	5	11/26/13
		12/5/13	12/5/13	Daily	Peak	5X16	1	12/4/13
		12/7/13	12/8/13	Daily	Subset of Off-Peak	2X16	2	12/6/13

Notes: 5x16 is non-holiday weekdays, hours 8 thru 23.
2x16 is weekend days and holidays, hours 8 thru 23.
7x16 is all days, hours 8 thru 23.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-029 **Page 1 of 7**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
This question pertains to the secondary wastewater treatment (SWWT) facility that was built as part of the installation of the wet flue gas desulfurization unit (Scrubber) at Merrimack Station. For 2013, please provide the days on which the SWWT operated as it was designed to reduce of the effluent from the primary wastewater treatment unit to a near-zero liquid discharge. For the days when the SWWT did not operate as it was designed, please provide in detail the reasons it did not operate.

Response:
In 2013 one or both of the Merrimack units operated during 170 days of the year. The secondary wastewater treatment system (SWWTS) operated during 189 days. This operation included the majority of January and February, and March through December when either Units 1 and/or 2 were in operation and as necessary after unit operations to optimize the scrubber vessel chemistry.

During the units' operation in 2013 the SWWTS did require maintenance during two different periods for portions of 12 days. Please see the attached table. Otherwise, the SWWTS was available and used for its intended purpose of significantly reducing the volume of treated primary wastewater.

The SWWTS equipment went into service in June 2012. Start-up, commissioning and early operational issues were experienced through the second half of 2012, recognizing the Merrimack units did not operate for long durations during that time frame until December 2012. In January 2013 the units were both operating at full load in response to the high winter demand. This resulted in the highest demand to date on the newly installed secondary wastewater equipment. With the early operation of new equipment, there were 2 periods during January and February when the system required maintenance to remove a build- up of solids. Specifically, each instance was due to this build-up or pluggage in the evaporation equipment in the SWWTS. Since this time, operation of the SWWTS continues to be optimized and the build-up of solids is managed to minimize any long term unavailability of the SWWTS due to pluggage.

Public Service Company of New Hampshire
Docket No. DE 14-120

	Daily operations		SWWTS	
	Merrimack 1	Merrimack 2	Operations	
Date				
1/1/13	24	24	Yes	
1/2/13	24	24	Yes	
1/3/13	24	24	Yes	
1/4/13	24	24	Yes	
1/5/13	24	24	Yes	
1/6/13	24	24	Yes	
1/7/13	24	24	Yes	
1/8/13	24	24	Yes	
1/9/13	0	24	Yes	
1/10/13	0	24	Yes	
1/11/13	0	24	Yes	
1/12/13	0	24	Yes	
1/13/13	0	24	Yes	
1/14/13	0	24	Yes	
1/15/13	0	24	Yes	
1/16/13	19	24	Yes	
1/17/13	24	24	Yes	
1/18/13	24	24	Yes	
1/19/13	24	24	Yes	
1/20/13	24	24	Yes	
1/21/13	24	24	Yes	
1/22/13	24	24	Yes	
1/23/13	24	24	Yes	
1/24/13	24	24	Yes	
1/25/13	24	24	Yes	pluggage
1/26/13	24	24	Yes	pluggage
1/27/13	24	24	Yes	pluggage
1/28/13	24	24	No	pluggage
1/29/13	24	24	Yes	
1/30/13	24	24	Yes	
1/31/13	24	24	Yes	
2/1/13	24	24	Yes	
2/2/13	24	24	Yes	
2/3/13	24	24	Yes	
2/4/13	24	24	Yes	
2/5/13	24	24	Yes	
2/6/13	24	24	Yes	
2/7/13	24	24	Yes	
2/8/13	24	24	Yes	
2/9/13	24	24	Yes	
2/10/13	24	24	Yes	
2/11/13	24	24	Yes	
2/12/13	24	24	Yes	
2/13/13	24	24	Yes	
2/14/13	24	24	Yes	
2/15/13	24	24	Yes	pluggage
2/16/13	24	24	Yes	pluggage
2/17/13	24	24	Yes	pluggage
2/18/13	24	24	Yes	
2/19/13	24	24	Yes	
2/20/13	24	24	Yes	
2/21/13	24	24	Yes	
2/22/13	24	24	Yes	pluggage
2/23/13	24	24	Yes	pluggage
2/24/13	24	24	Yes	
2/25/13	24	24	Yes	
2/26/13	24	24	Yes	pluggage
2/27/13	24	24	Yes	pluggage
2/28/13	24	24	Yes	pluggage

Public Service Company of New Hampshire
Docket No. DE 14-120

	Daily operations		SWWTS
	Merrimack 1	Merrimack 2	Operated
Date			
3/1/13	24	24	Yes
3/2/13	24	24	Yes
3/3/13	24	24	Yes
3/4/13	24	24	Yes
3/5/13	24	24	Yes
3/6/13	24	24	Yes
3/7/13	24	24	Yes
3/8/13	24	24	Yes
3/9/13	24	24	Yes
3/10/13	23	23	Yes
3/11/13	24	24	Yes
3/12/13	24	24	Yes
3/13/13	24	22	Yes
3/14/13	24	24	Yes
3/15/13	24	24	Yes
3/16/13	24	24	Yes
3/17/13	24	24	Yes
3/18/13	24	24	Yes
3/19/13	24	24	Yes
3/20/13	24	24	Yes
3/21/13	24	1	Yes
3/22/13	24	0	Yes
3/23/13	24	0	Yes
3/24/13	24	8	Yes
3/25/13	24	24	Yes
3/26/13	24	24	Yes
3/27/13	24	24	Yes
3/28/13	24	24	Yes
3/29/13	24	22	Yes
3/30/13	0	0	Yes
3/31/13	0	0	Yes
4/1/13	0	0	Yes
4/2/13	20	0	Yes
4/3/13	24	0	Yes
4/4/13	2	0	Yes
4/5/13	0	0	Yes
4/6/13	0	0	Yes
4/7/13	0	0	Yes
4/8/13	0	0	
4/9/13	0	0	
4/10/13	0	0	
4/11/13	0	0	
4/12/13	0	0	
4/13/13	0	0	
4/14/13	0	0	
4/15/13	0	0	
4/16/13	0	0	
4/17/13	0	0	
4/18/13	0	0	
4/19/13	0	0	
4/20/13	0	0	
4/21/13	0	0	
4/22/13	0	0	
4/23/13	0	0	
4/24/13	0	0	
4/25/13	0	0	
4/26/13	0	0	
4/27/13	0	0	
4/28/13	0	0	
4/29/13	0	0	
4/30/13	0	0	

Public Service Company of New Hampshire
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Date	Daily operations Merrimack 1	Daily operations Merrimack 2	SWWTS Operations
5/1/13	0	0	
5/2/13	0	0	
5/3/13	0	0	
5/4/13	0	0	
5/5/13	0	0	
5/6/13	0	0	
5/7/13	0	0	
5/8/13	0	0	
5/9/13	0	0	
5/10/13	0	0	
5/11/13	0	0	
5/12/13	0	0	
5/13/13	0	0	
5/14/13	0	0	
5/15/13	0	0	
5/16/13	0	0	
5/17/13	0	0	
5/18/13	0	0	
5/19/13	0	0	
5/20/13	0	0	
5/21/13	0	0	
5/22/13	0	0	
5/23/13	0	0	
5/24/13	0	0	
5/25/13	0	0	
5/26/13	0	0	
5/27/13	0	0	
5/28/13	0	0	
5/29/13	0	0	
5/30/13	19	3	
5/31/13	24	20	Yes
6/1/13	24	24	Yes
6/2/13	24	24	Yes
6/3/13	24	24	Yes
6/4/13	24	21	Yes
6/5/13	24	20	Yes
6/6/13	0	1	Yes
6/7/13	0	0	Yes
6/8/13	0	0	Yes
6/9/13	0	0	Yes
6/10/13	0	0	Yes
6/11/13	0	0	
6/12/13	0	0	
6/13/13	0	0	
6/14/13	0	0	
6/15/13	0	0	
6/16/13	0	0	
6/17/13	0	0	
6/18/13	0	0	
6/19/13	0	0	
6/20/13	0	0	
6/21/13	0	0	
6/22/13	0	0	
6/23/13	0	0	
6/24/13	11	8	Yes
6/25/13	24	24	Yes
6/26/13	24	24	Yes
6/27/13	19	0	Yes
6/28/13	0	0	Yes
6/29/13	0	0	
6/30/13	0	0	

Public Service Company of New Hampshire
Docket No. DE 14-120

	Daily operations		SWWTS
	Merrimack 1	Merrimack 2	Operations
Date			
7/1/13	0	0	Yes
7/2/13	0	0	Yes
7/3/13	0	0	Yes
7/4/13	0	0	Yes
7/5/13	19	19	Yes
7/6/13	24	24	Yes
7/7/13	24	24	Yes
7/8/13	24	24	Yes
7/9/13	24	24	Yes
7/10/13	24	24	Yes
7/11/13	24	24	Yes
7/12/13	24	24	Yes
7/13/13	24	24	Yes
7/14/13	24	24	Yes
7/15/13	24	24	Yes
7/16/13	24	24	Yes
7/17/13	24	24	Yes
7/18/13	24	24	Yes
7/19/13	24	24	Yes
7/20/13	24	24	Yes
7/21/13	24	24	Yes
7/22/13	0	24	Yes
7/23/13	0	22	Yes
7/24/13	0	0	Yes
7/25/13	0	0	
7/26/13	0	0	
7/27/13	0	0	
7/28/13	0	0	
7/29/13	0	0	
7/30/13	0	0	
7/31/13	0	0	
8/1/13	0	0	
8/2/13	0	0	
8/3/13	0	0	
8/4/13	0	0	
8/5/13	9	10	Yes
8/6/13	24	24	Yes
8/7/13	24	24	Yes
8/8/13	24	24	Yes
8/9/13	9	3	Yes
8/10/13	0	0	Yes
8/11/13	0	0	
8/12/13	0	0	Yes
8/13/13	0	0	Yes
8/14/13	0	0	Yes
8/15/13	0	0	Yes
8/16/13	0	0	Yes
8/17/13	0	0	
8/18/13	0	0	
8/19/13	0	0	Yes
8/20/13	0	0	Yes
8/21/13	0	0	Yes
8/22/13	0	0	
8/23/13	0	0	
8/24/13	0	0	
8/25/13	0	0	
8/26/13	0	0	
8/27/13	0	0	
8/28/13	0	0	
8/29/13	0	0	
8/30/13	0	0	
8/31/13	0	0	

Public Service Company of New Hampshire
Docket No. DE 14-120

Date	Daily operations Merrimack 1	Merrimack 2	SWWTS Operations
9/1/13	0	0	
9/2/13	0	0	
9/3/13	0	0	
9/4/13	0	0	
9/5/13	0	0	
9/6/13	0	0	
9/7/13	0	0	
9/8/13	0	0	
9/9/13	0	0	
9/10/13	0	0	
9/11/13	16	14	Yes
9/12/13	24	22	Yes
9/13/13	1	0	
9/14/13	0	0	
9/15/13	0	0	
9/16/13	0	0	
9/17/13	0	0	
9/18/13	0	0	
9/19/13	0	0	
9/20/13	0	0	
9/21/13	0	0	
9/22/13	0	0	
9/23/13	0	0	
9/24/13	0	0	
9/25/13	0	0	
9/26/13	0	0	
9/27/13	0	0	
9/28/13	0	0	
9/29/13	0	0	
9/30/13	0	0	
10/1/13	0	0	
10/2/13	0	0	
10/3/13	0	0	
10/4/13	0	0	
10/5/13	0	0	
10/6/13	0	0	
10/7/13	0	0	
10/8/13	0	0	
10/9/13	0	0	
10/10/13	0	0	
10/11/13	0	0	
10/12/13	0	0	
10/13/13	0	0	
10/14/13	0	0	
10/15/13	0	0	
10/16/13	0	0	
10/17/13	0	0	
10/18/13	0	0	
10/19/13	0	0	
10/20/13	0	0	
10/21/13	0	0	
10/22/13	0	0	
10/23/13	0	0	
10/24/13	0	0	
10/25/13	0	0	
10/26/13	0	0	
10/27/13	0	0	
10/28/13	0	0	
10/29/13	0	0	
10/30/13	0	0	
10/31/13	0	0	

Public Service Company of New Hampshire
Docket No. DE 14-120

	Daily operations		SWWTS
	Merrimack 1	Merrimack 2	Operations
Date			
11/1/13	0	0	
11/2/13	0	0	
11/3/13	0	0	
11/4/13	0	0	
11/5/13	0	0	
11/6/13	0	0	
11/7/13	0	0	
11/8/13	0	0	
11/9/13	0	0	
11/10/13	0	0	
11/11/13	0	0	
11/12/13	0	0	
11/13/13	0	0	
11/14/13	0	0	
11/15/13	0	0	
11/16/13	0	0	
11/17/13	0	0	
11/18/13	0	0	
11/19/13	0	0	
11/20/13	0	0	
11/21/13	0	0	
11/22/13	12	0	
11/23/13	24	0	Yes
11/24/13	24	0	Yes
11/25/13	24	0	Yes
11/26/13	24	0	Yes
11/27/13	24	0	Yes
11/28/13	24	0	Yes
11/29/13	24	0	Yes
11/30/13	24	0	Yes
12/1/13	24	0	Yes
12/2/13	24	0	Yes
12/3/13	24	0	Yes
12/4/13	24	0	Yes
12/5/13	24	0	Yes
12/6/13	24	0	Yes
12/7/13	24	11	Yes
12/8/13	24	24	Yes
12/9/13	24	24	Yes
12/10/13	24	24	Yes
12/11/13	24	24	Yes
12/12/13	24	24	Yes
12/13/13	24	24	Yes
12/14/13	24	24	Yes
12/15/13	24	24	Yes
12/16/13	24	24	Yes
12/17/13	24	24	Yes
12/18/13	24	24	Yes
12/19/13	24	24	Yes
12/20/13	24	24	Yes
12/21/13	24	24	Yes
12/22/13	24	24	Yes
12/23/13	24	24	Yes
12/24/13	24	24	Yes
12/25/13	24	24	Yes
12/26/13	24	24	Yes
12/27/13	24	24	Yes
12/28/13	24	24	Yes
12/29/13	24	1	Yes
12/30/13	24	0	Yes
12/31/13	24	6	Yes

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-030 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula

Request:
For 2013, please provide a list of all shipments of water from the primary wastewater treatment facility to publicly owned water treatment facilities. Please provide the information by date, volume of water and destination, along with the cost of making the shipments and disposing it at the public facility.

Response:
Attached is a list of shipments of treated water from the primary wastewater treatment facility including the data, volume, and destination, as well as the cost of disposal and trucking of the shipments.

Primary Wastewaster trucking in 2013

Month	Date	Day	Lowell (gals)	Allenstown (gals)	Hooksett (gals)
January	1.25.13	Friday			
			8000		8007
			8000		
	1.26.13	Saturday	8000	8000	8003
			8000	8000	8000
			8000	8000	8000
	1.27.13	Sunday	8000	8000	8000
			8000	8000	8000
			8000	8000	
	1.28.13	Monday	8000	8000	8000
				8000	8000
					8000
					3500
	Total Gallons		**72,000**	**64,000**	**75,510**
	Disposal Cost		$ 2,520	$ 1,920	$ 2,265
	Trucking Cost		$ 4,176	$ 1,920	$ 2,265
	Total Cost		**$ 6,696**	**$ 3,840**	**$ 4,531**

February	2.15.13	Friday		8000	8000
	2.16.13	Saturday		8000	8000
				8000	8000
					8000
					8000
					8000
					8000
	2.17.13	Sunday		8000	8000
	Total Gallons		-	**32,000**	**64,000**
	Disposal Cost		$ -	$ 960	$ 1,920
	Trucking Cost		$ -	$ 960	$ 1,920
	Total Cost		**$ -**	**$ 1,920**	**$ 3,840**

February	2.22.13	Friday		6000	6000
				6000	6000
				6000	6000
	2.23.13	Saturday			6000
					6000
					6000
					6000
	2.26.13	Tuesday		8000	8000
				8000	8000
					8000
	2.27.13	Wednesday		8000	8000
				8000	8000
				8000	8000
				8000	8000
				8000	
	2.28.13				8000
					8000
					8000
	Total Gallons		-	**74,000**	**122,000**
	Disposal Cost		$ -	$ 2,220	$ 3,660
	Trucking Cost		$ -	$ 2,220	$ 3,660
	Total Cost		**$ -**	**$ 4,440**	**$ 7,320**

Public Service of New Hampshire

780 N. Commercial Street, Manchester, NH 03101

Public Service Company of New Hampshire
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(603) 634-2701
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The Northeast Utilities System

Christopher J. Goulding
Manager, NH Revenue Requirements

E-Mail: Christopher.goulding@psnh.com

November 7, 2014

By Electronic Mail Only

Suzanne G. Amidon
Staff Attorney
New Hampshire Public Utilities Commission
21 South Fruit Street
Concord, NH 03301

RE: DE 14-120 Public Service Company of New Hampshire Annual Reconciliation of Energy Service and Stranded Costs for 2013

Dear Attorney Amidon:

I enclose Public Service Company of New Hampshire's responses to the second set of data requests from Commission Staff in the above-captioned proceeding. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Christopher J. Goulding
Manager
NH Revenue Requirements

Enclosures
cc : Discovery Service List (by electronic mail only)

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 10/24/2014 **Date of Response: 11/07/2014**
Request No. STAFF 2-031 **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **William H. Smagula**

Request:
For 2013, please provide the dates on which the truck wash at Merrimack Station was operated as designed.

Response:
Operation of the truck wash at Merrimack Station is not tracked or recorded. However, because lower cost coal with appropriate operational and environmental characteristics was available via rail to Merrimack Station, the truck wash was not needed to facilitate back hauling of gypsum in coal trucks from Schiller Station in 2013.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-001 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Michael L. Shelnitz

Request:
Reference testimony of Shelnitz at Bates p. 5, lines 11-22. Please provide documentation and an explanation of services for the $ 10.5 million PSNH paid NUSCO and for which PSNH is seeking recovery from ratepayers.

Response:
Please reference STAFF 1-001.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-003 **Page 1 of 2**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Reference MLS 2, lines 17-20. Please identify the factors used in determining the following:

a. Whether or not to charge replacement power costs for Merrimack 2 outages dated 3/21 – 3/24/13 and 12/29 – 12/31-13;
b. Whether or not to charge replacement power costs for Merrimack 2 outages dated 4/21-5/10/13 and 7/25 -7/29/13;
c. Whether or not to charge replacement power costs for Merrimack 1 outages dated 1/8-1/11/13 and 5/6-5/17/13;
d. Whether or not to charge replacement power costs for Schiller 4 outage dated 5/5-5/15/13;
e. Whether or not to charge replacement power costs for Schiller 5 outage dated 10/25 -11/02/13;
f. Whether or not to charge replacement power costs for Wyman 4 outage dated 8/7-8/11/13.

Response:

The figures shown in MLS-2 are positive replacement power cost (RPC) values. When RPC values, calculated according to agreed upon methodology, are less than zero they are shown in this exhibit as zero because there was no incremental cost to customers due to the unit being unavailable to generate energy. Calculated negative values imply customers' energy costs would have been higher had the unit generated energy during the outage period.

PSNH's filing includes actual costs incurred, which include the costs identified in MLS-2, as well as the lower energy costs incurred during the outage periods represented by negative RPC. Please see the attached table which replaces the zeroes in MLS-2 with the calculated negative RPC values associated with items a. thru f.

Also reference OCA 1-010 in this docket, and DE 13-108 Q-OCA 1-011.

PSNH Replacement Power Costs (RPC)

OCA 1-003 Item	UNIT	DATES	PSNH RPC $
c.	Merrimack 1	1/8/13 - 1/11/13	(30,324)
c.		5/6/13 - 5/17/13	(35,261)
a.	Merrimack 2	3/21/13 - 3/24/13	190,229
b.		4/21/13 - 5/10/13	(315,937)
b.		7/25/13 - 7/29/13	(351,216)
a.		12/29/13 - 12/31/13	737,535
d.	Schiller 4	5/5/13 - 5/15/13	(8,791)
e.	Schiller 5	10/25/13 - 11/2/13	130,133
f.	Wyman 4	8/7/13 - 8/11/13	(130,507)

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-005 **Page 1 of 2**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Reference testimony of White at Bates page 43, lines 17-19 where it states "Resources are paid for providing capacity, and the total payments for capacity resources in each month are charged to ISO-NE load serving entities based on their relative share of the prior year's peak demand." Please provide additional information about PSNH's monthly capacity and its relative share of regional peak demand in the form of a schedule similar to the one provided by Unitil in its response to OCA 1-3 dated July 9, 2014 in Docket DE 14-170. See attachment to these data requests for copy of Unitil's response.

Response:
PSNH objects to the question to the extent that it requests information outside the scope of the docket. Subject to, and without waiving, this objection, PSNH will provide a response in accordance with the procedural schedule in the docket.

Please see the attached table for the requested capacity market information. PSNH notes that the UNITIL data request appears to address the allocation of pool transmission costs and not capacity market costs. Transmission costs are allocated differently than capacity market costs. Capacity market costs are allocated based on each load serving entity's share of the prior commitment period's peak load, which resets each June. If a load serving entity's load is subject to retail choice its share of the prior year's annual peak will change over time. This is the case for PSNH's default service load. The share of the prior year's peak load is calculated daily to reflect retail choice movement that occurs daily. So while the capacity market costs are settled monthly, the peak loads used in settlement and shown in the attached table are the daily values averaged for the month.

Derivation of PSNH ES Share of Capacity Market Requirement in a Format Similar to UES's Response to OCA 1-13 in Docket ES 14-170

Description	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Capacity market average monthly PSNH ES peak load value (MW)	992	985	952	906	874	810	812	802	795	792	793	810
Capacity market monthly pool peak load value (MW)	25,400	25,400	25,400	25,400	25,400	23,885	23,885	23,885	23,885	23,885	23,885	23,885
PSNH ES monthly share of capacity market requirement (%)	3.90%	3.88%	3.75%	3.57%	3.44%	3.39%	3.40%	3.36%	3.33%	3.32%	3.32%	3.39%

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-010 **Page 1 of 3**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Please provide a schedule in the same format as the response to OCA-01 Q-OCA-008 in DE 13-108 detailing the calculation of replacement power costs. Please explain any differences in the calculation methodology since the response provided in DE 13-108.

Response:

Please see the attached table for the requested information. The calculation methodology has been consistently applied in replacement power cost calculations for many years and has not changed since DE 13-108.

Replacement Power Costs - $(000)

Merrimack 1

Date	Total RPC	Spot Purchases	Bilateral Purchases	PSNH Gen	Avoided Fuel
1/8/13	0	0	0	0	0
1/9/13	(10)	1	68	7	(86)
1/10/13	(10)	1	68	13	(93)
1/11/13	(10)	(2)	68	5	(82)
Subtotal	(30)	(0)	204	26	(260)
5/6/13	15	1	56	(6)	(35)
5/7/13	6	19	61	(1)	(73)
5/8/13	5	19	60	(1)	(72)
5/9/13	5	19	64	(1)	(77)
5/10/13	7	19	62	(3)	(72)
5/11/13	(16)	39	0	6	(61)
5/12/13	(13)	20	0	3	(36)
5/13/13	(8)	22	0	3	(34)
5/14/13	(11)	31	0	4	(47)
5/15/13	(10)	42	0	6	(58)
5/16/13	(8)	25	0	5	(37)
5/17/13	(7)	19	0	3	(29)
Subtotal	(35)	275	303	18	(631)

Merrimack 2

Date	Total RPC	Spot Purchases	Bilateral Purchases	PSNH Gen	Avoided Fuel
3/21/13	138	28	288	10	(188)
3/22/13	58	35	181	19	(177)
3/23/13	(9)	68	127	(17)	(186)
3/24/13	4	(82)	127	(3)	(37)
Subtotal	190	48	722	8	(587)
4/21/13	(16)	84	0	(10)	(90)
4/22/13	(22)	73	0	(1)	(94)
4/23/13	(18)	83	0	26	(127)
4/24/13	(18)	30	0	2	(50)
4/25/13	(14)	28	0	(4)	(38)
4/26/13	(13)	35	0	(5)	(43)
4/27/13	(22)	62	0	(8)	(76)
4/28/13	(20)	46	0	4	(70)
4/29/13	(11)	43	0	13	(67)
4/30/13	(15)	38	0	8	(61)
5/1/13	(20)	30	0	8	(58)
5/2/13	(21)	23	0	10	(54)
5/3/13	(26)	35	0	12	(74)
5/4/13	(17)	23	0	(4)	(37)
5/5/13	(26)	39	0	(6)	(59)
5/6/13	(17)	27	0	(4)	(41)
5/7/13	(5)	11	0	(1)	(14)
5/8/13	(5)	11	0	(1)	(14)
5/9/13	(5)	12	0	(2)	(16)
5/10/13	(5)	8	0	(2)	(10)
Subtotal	(316)	742	0	35	(1,093)
7/25/13	(21)	(76)	168	(11)	(102)
7/26/13	(80)	36	168	(27)	(257)
7/27/13	(94)	39	157	(28)	(263)
7/28/13	(101)	46	158	(29)	(276)
7/29/13	(54)	(120)	190	(12)	(112)
Subtotal	(351)	(75)	840	(106)	(1,010)
12/29/13	136	383	0	3	(249)
12/30/13	135	387	0	(0)	(252)
12/31/13	467	685	0	(4)	(214)
Subtotal	738	1,454	0	(2)	(715)

Replacement Power Costs - $(000)

Schiller 4

Date	Total RPC	Spot Purchases	Bilateral Purchases	PSNH Gen	Avoided Fuel
5/5/13	(0)	0	0	(0)	(0)
5/6/13	(0)	0	0	(0)	(0)
5/7/13	(0)	0	0	(0)	(0)
5/8/13	(0)	0	0	(0)	(0)
5/9/13	(0)	0	0	(0)	(0)
5/10/13	(0)	0	0	(0)	(0)
5/11/13	(2)	3	0	(5)	0
5/12/13	(1)	1	0	(3)	0
5/13/13	(1)	2	0	(3)	0
5/14/13	(2)	2	0	(4)	0
5/15/13	(2)	3	0	(5)	0
Subtotal	(9)	12	0	(20)	(1)

Schiller 5

Date	Total RPC	Spot Purchases	Bilateral Purchases	PSNH Gen	Avoided Fuel
10/25/13	1	2	0	0	(1)
10/26/13	15	28	0	0	(14)
10/27/13	14	28	0	0	(14)
10/28/13	17	31	0	0	(14)
10/29/13	21	34	0	0	(13)
10/30/13	21	34	0	0	(13)
10/31/13	20	34	0	0	(13)
11/1/13	20	33	0	0	(13)
11/2/13	1	4	0	0	(2)
Subtotal	130	228	0	0	(98)

Wyman 4

Date	Total RPC	Spot Purchases	Bilateral Purchases	PSNH Gen	Avoided Fuel
8/7/13	(14)	3	0	(17)	0
8/8/13	(13)	4	0	(17)	0
8/9/13	(34)	11	0	(46)	0
8/10/13	(36)	10	0	(45)	0
8/11/13	(34)	8	0	(43)	0
Subtotal	(131)	37	0	(168)	0

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-011 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Reference Attachment FBW-5. The sixth column of information labeled "PSNH Capacity Resources MW" shows 2 increases during the year. From May to June there is an increase from 1141 to 1212 and then from September to October there is an increase from 1213 to 1235. Please explain the source of the incremental PSNH capacity resources accounting for these two increases.

Response:

The transition from May, 2013, to June, 2013 marks the transition between ISO-NE capacity commitment periods, which run from June thru May of the following calendar year. So one commitment period ended on May 31, 2013, and a new one began on June 1, 2013. Each commitment period is based on separate parameters established by ISO-NE. Additionally, the May to June transition marks the transition from any given resource's winter capability MW to summer capability MW, typically a decrease in MW capability. The capacity market purchases summer rated capacity except for intermittent resources, and many of the IPPs are intermittent resources so their capability decreases during the summer period. In the commitment period which began June 1, 2013 PSNH's owned resources cleared an additional approximately 95 MW in ISO-NE capacity auctions, offset by a decrease in IPP capacity MW of approximately 25 MW, resulting in the net increase of approximately 70 MW. The transition from September to October is marked by the return to winter capability ratings and the approximately 22 MW increase is attributable to an increase in IPP capacity MW.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-012 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Reference Attachment FBW-5. Please explain why the values shown at FBW-5 column 8 ("PSNH Net Capacity Expense $(000)") do not match the monthly values shown on MLS-3 pages 1-2 of 2, line 38 ("Capacity Costs').

Response:

Attachment FBW-5 reflects the latest settlement data available from ISO-NE for activity occurring in the operating month. Attachment MLS-3, Pages 1 and 2, line 38, reflects Capacity Costs as recorded on the financial records of PSNH from monthly transactions billed by ISO-NE. The monthly transactions recorded include a current month estimate, a true-up of the prior month estimate to actual, and any prior period resettlements billed by ISO-NE. Thus, timing differences, with the largest occurring in December, account for the majority of the differences between the two attachments.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014
Request No. OCA 1-013
Request from: Office of Consumer Advocate

Date of Response: 08/01/2014
Page 1 of 1

Witness: Frederick White

Request:
Reference testimony of White at Bates page 45, line 14 – Bates page 47, line 12 which provides an explanation of the Company's decision making process regarding dispatch of its "generation units during periods when the units are not economic when compared with the regional electric markets." The explanation provided addresses various issues: "PSNH compares dispatch costs...", "considers weather and expected [ ] load", "planning discussions...occur at least twice weekly", and other comparable general considerations. Has the Company developed a decision model, optimization model or other such tool which uses numerical inputs and generates numerical outputs to assist the Company in the decision making process?

Response:

The Company utilizes Excel-based analysis tools to evaluate on a daily basis its ES portfolio of resources and loads. The tools also automatically develop inputs in the required electronic format for entry into ISO-NE's electronic market system. Generating unit-based tools incorporate for dispatchable units operating characteristics (such as heat rate, start-up costs and no-load costs), the costs of fuels and fuel activities (such as handling, additives, and residual expenses), and variable maintenance and emissions costs. Hydros, must take resources, and any transactions are also incorporated into analysis tools. PSNH also utilizes load forecasting tools that incorporate regional weather forecasts and near-term load trends. Market price information is gathered from various sources such as monitoring broker quotations/transactions, fuel suppliers, online information, and recent price history. This information is coordinated and integrated within Excel-based tools to aid in the comprehensive review and evaluation of the ES portfolio, and to form a strategy for serving ES load. They are not decision or optimization models, per se, in that they do not automatically identify specific actions to be taken. Rather, they are complex numerically based analysis tools that utilize numerical inputs and outputs and assist the Company in the decision making process.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-014 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Reference FBW-5 "Summary of PSNH Capacity Position – 2013." Is it a correct understanding that beginning in April 2013, PSNH's Capacity Resources (expressed in MW) exceeded PSNH's Share of ISO-NE's Load Obligation (also expressed in MW) and remained in that surplus position for the remainder of 2013?

Response:
Yes.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-016 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference Testimony of Smagula at Bates page 55, lines 14 – 16. The testimony states "The 9 hydro facilities, comprised of 20 units, operated successfully and produced 9.8% more generation than the prior year." What factors contributed to the increase in generation from the previous year?

Response:
PSNH Hydro generated 363,838 MWh. This was ~10% greater than 2012 generation (see staff 1-017) and 7% above the long term average. Each facility produced more megawatt-hours in 2013 than 2012, primarily due to heavy precipitation and record generation in April, June and July which was somewhat offset by below average precipitation in quarter 4.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-017 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference Testimony of Smagula at Bates page 57, lines 16-18. The testimony states "Unplanned outages listed below do include short term maintenance outages coordinated with wholesale marketing and scheduled with ISO-NE." This statement appears to combine comments regarding "unplanned outages," "maintenance outages," and outages "scheduled with ISO-NE." Please clarify this statement.

Response:
This statement confirms that this list of unplanned outages not only includes forced outages but also may include a preventative maintenance outage that is scheduled on short notice with ISO-NE. These are outages that are differentiated from the annual planning effort with ISO-NE which results in the Scheduled Outages listed on Bates page 61.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014
Request No. OCA 1-018
Request from: Office of Consumer Advocate

Date of Response: 08/01/2014
Page 1 of 1

Witness: William H. Smagula

Request:
Please provide details on all capital and O&M expenditures, by generation unit, incurred during 2013 to comply with environmental compliance requirements.

Response:
Generation's budgets are primarily managed at a station and division level. Environmental compliance, like safety, is one of Generation's highest priorities and is an integral part of each and every activity completed at the facilities. As such, it would be difficult to assign a specific dollar value to a category termed environmental compliance. Certain environmental activities are tracked as shown below. Other day-to-day activities and environmental staff and environmental coordinators working with station personnel to ensure compliance with all environmental requirements are not tracked and would be in addition to the costs below.

There were no specific environmental compliance capital projects in 2013. Hydro's Eastman Falls Station is in its re-licensing process, a multi-year project.

Environmental Items	Merrimack ($000)	Newington ($000)
NH-DES Emissions Fees, etc.	929	102
Continuous Monitoring Equipment and associated work	222	55
Hazardous Waste	3	13
Environmental Compliance and other regulatory compliance	2109	234

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-019 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula at Bates page 59, lines 17-19 regarding outage 2013-OR-04. The testimony states "The unit [Schiller 4] was removed from service to perform a preventative maintenance outage including the installation of the generator hydrogen coolers." Please describe the purpose of "the generator hydrogen coolers" and why their installation was necessary. What was the cost of this installation?

Response:
Generators produce heat during operation and require a means for cooling to avoid thermal related damage. Schiller utilizes hydrogen gas as the cooling medium which is an industry standard. Heat exchangers, in this case the hydrogen coolers, are used to cool the hydrogen gas after it captures heat from the generator. Cooling water from the plant's closed cooling water system is passed through tubes in the coolers and captures the heat from the hydrogen gas that passes on the outside of the tubes. As the tubes wear over time, they can cause water leaks that can enter the generator and create significant electrical damage. Tube failures and recent analyses and testing by a heat exchanger expert confirmed sufficient wearing of the tubes that replacement of the coolers was recommended. The total cost for the purchase and installation of the hydrogen coolers was $194,992.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-020 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula at Bates page 62, lines 1-2. When does PSNH plan to provide the "2013 Status summary"?

Response:
PSNH agreed to initiate a program which addresses danger trees outside the right-of-way as part of its regular vegetation maintenance cycles. PSNH will provide detailed information during the review sessions completed by the Staff Consultant.

Highlights of the 2013 status are shown below:

	Actual $ Spent	Actual # trees removed
Transmission	$701,000	7,607
Distribution ROW	$52,433	315
Distribution	$3,305,141	11,187

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-021 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula at Bates page 70 regarding outage C at Schiller 5. Please discuss the causes of this "Boiler Miscellaneous" outage as it follows so closely on the completion of "Boiler Overhaul" performed during outage B.

Response:
Schiller 5 began its spring overhaul on April 13 at 1017. At the completion of this 3 week outage, the unit was phased on May 3 at 0837. At 1220, during the startup from the overhaul, the unit experienced pluggage in a wood feed chute. When fuel interruptions occur, the boiler goes into an unbalanced or "swing" condition, especially during a start up, and many parameters are affected, ie draft, drum level, steam flow & temperature, to name a few. In this case, the pluggage caused the the steam pressure to decay to a point where the unit tripped on loss of condenser vacuum. The chute pluggage was cleared and the unit was returned to service and phased at 1928.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-022 **Page 1 of 2**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula at Bates page 65. Please provide a discussion of Merrimack 2 Outage F which lasted 82.4 days and is described as "Major Generator Overhaul." What work was involved, outside contractors used, etc?

Response:
Merrimack Station Unit 2's fall outage occurred September 16 – December 7, 2013, lasting 82.4 days. The schedule was as follows:

Outage Start Date:	Monday, September 16
ISO Start Date:	Monday, September 23
ISO Original End :	Friday, November 1
ISO Revised End:	Tuesday, December 10
Outage End date:	Saturday, December 7

In summary, Merrimack Station Unit 2 began its scheduled maintenance outage Monday, September 16th at 07:00. The outage was scheduled to begin on Monday, September 23rd, but with energy prices low and the unit not anticipated to run, a short term outage request was submitted to ISO to begin work during the prior week. The early start allowed the station to better utilize station labor, minimizing overtime and contractor use. The planned critical path work included cyclone and boiler repairs as well as the replacement of generator blower stationary blades. Major work identified included a generator rotor inspection; turbine inspection; generator blower stationary blade replacement; cyclone inspection and repair including flat stud, pin stud and wear block replacement, as necessary, and refractory installation; air heater vacuuming, washing and inspection; SCR Catalyst vacuuming; and precipitators vacuuming, washing and inspection.

Within the first week of the outage, during the planned inspection and testing of the generator stator, repair needs were identified. In consultation with Siemens Generator Services, the generator contractor, it was determined that the best solution to address the necessary work was a generator rewind. This generator rewind required additional outage time and ISO-NE was contacted to extend the outage end date tentatively to December 2 and then finalized with a revised end date of December 10, 2013.

There were a number of contractors and vendors used during the outage. Vendors are brought in to complete vacuuming services, precipitator inspection, turbine/generator inspection, pipe hanger inspections, non-destructive examinations, valve repairs, large fan repairs, and safety valve inspections.

Contractors provide additional labor, scaffolding, insulation removal and installation, refractory installation, expansion joint installation, etc. These companies provide specialized work in many instances and are scheduled to optimize the cost and duration of the outage.

<u>The list of contractors and vendors is shown here:</u>

- North American Services
- Altair Equipment
- American Plant Maintenance, Inc.
- Atlantic Scaffolding
- O'Connor Boiler
- SEVCO INC
- Ocean State Inspection and Testing
- Salem Refractory
- Millennium Valves
- Atlantic Insulation
- Southern Field Maintenance and Fabrication
- United Dynamics Advanced Technologies Corp
- Siemens Energy
- Quality Inspection Services, Inc (QISI)
- Siemens Generator Services
- Safeway Scaffolding
- Maine Automation
- New England Scaffolding
- Ayers Electric
- Industrial Air Flow Dynamics (IAFD)
- Arise Insurance Co.
- Howden American Fan

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | Date of Response: 08/01/2014
Request No. OCA 1-023 | Page 1 of 1
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula, WHS 2. Please explain the reasoning behind scheduling a planned outage for Merrimack 1 in January 2013.

Response:
This preventative maintenance outage was a short-term scheduled outage lasting less than 3 days during a low price period in January to avoid a forced outage during the remainder of the winter months when the demand for power and market prices were expected to be very high.

This Merrimack 1 preventative maintenance outage was taken to perform an air heater wash. Air heater pluggage occurs over time. Monitoring the air heater and proactively washing the air heater reduces the risk of a forced outage. As shown in MLS-2 there was no replacement power cost associated with this outage.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-024 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula WHS 2. After the March 21-24 repairs to Merrimack 2, on what date did Merrimack 2 next provide energy to the New England grid?

Response:
With the forced outage work complete on March 24, the unit was released to ISO at 0415 and the unit phased and began providing energy to the grid at 1604 on that date.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-025 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula, WHS 2. Prior to the Merrimack 2 December 29 outage, was Merrimack 2 operating pursuant to ISO-NE scheduling or self-scheduling by PSNH?

Response:
Prior to the Merrimack Unit 2 forced outage which occurred on December 29, the unit was self-scheduled to minimum load, 235 MWs, and offered economically above that load.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-026 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference testimony of Smagula, WHS 2. Subsequent to the Merrimack 2 December 29 outage, was Merrimack 2 operating pursuant to ISO-NE scheduling or self-scheduling by PSNH?

Response:
Subsequent to the Merrimack Unit 2 forced outage December 29 - 31, the unit was self-scheduled to minimum load, 235 MWs, and offered economically above that load.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-027 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Were there any instances in 2013 when the Scrubber was not functioning as designed? Can MK1 and MK2 supply energy to the grid when the Scrubber is not functioning as designed?

Response:
There was no time in 2013 when the scrubber did not operate as designed, that is to remove greater than 80% mercury emissions and greater than 90% SO2 emissions.

In general the units must be operated with the scrubber in operation or with the scrubber sufficiently reducing emissions to be in compliance with Merrimack Station's air permit. Specifically, the Station's NHDES- Air Resources Division, Temporary Permit TP-008, states: Beginning on July 1, 2013, the owner shall not operate MK2 unless the scrubber is in operation. Beginning on July 1, 2013, the owner shall not operate MK1 without the scrubber if the scrubber is capable of stable operation. And beginning on July 1, 2013, the owner shall not operate MK1 without the scrubber in service for more than 840 hours recognizing that all other permitting requirements must be maintained.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014
Request No. OCA 1-028
Request from: **Office of Consumer Advocate**

Date of Response: 08/01/2014
Page 1 of 1

Witness: **William H. Smagula**

Request:
Were there any instances in 2013 when Scrubber problems or inoperability caused MK1 or MK2 to: 1) curtail operations; 2) come offline; or 3) shut down as a result?

Response:
No.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. OCA 1-032 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: William H. Smagula

Request:
Reference MLS-4 page 13, lines 2. Discuss why O&M Costs have increased from $79,290,000 in 2012 to $81,460,000 in 2013. Given declining generation activity as reflected by 18% decline in Retail MHW sales for 2013 as compared to 2012, discuss the underlying factors that have caused increased O&M costs in 2013.

Response:
The O&M costs of our generation fleet are related to the energy produced by that fleet, and not necessarily to total Energy Service MWH sales, Specifically, the O&M cost, on page 13, line 2, reflects an increase of 2.7% from 2012 to 2013. The largest portion of this O&M line is the costs associated with the operations and maintenance of the generating plants. The PSNH fleet produced approximately 2.3 million MWh in 2013, 13% more generation than in 2012 when the units produced approximately 2.0 million MWhs (see Staff 1-017). In this case the increase in O&M costs is consistent with the increase in generation. However, it should be noted that not all operational and maintenance costs track with generation. For example, some maintenance work and costs are cyclical in nature and will not align with the output of a unit to produce a constant dollar per megawatt-hour value.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-033 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Michael L. Shelnitz

Request:
Reference MLS-4 page 13 "2013 Reconciliation O&M" and reference DE 12-292 Shelnitz and White's 6/13/2013 Technical Statement Attachment MLS-2 page 5 "2013 Mid year forecast O&M". The "2013 Mid year forecast O&M" is $106,840,000 or 2.71 cents per kWh. The "2013 Reconciliation O&M" increases $22,081,000 to $128,921,000 or 3.42 cents per kWh. Are these O&M cost calculations comparable or do they contain different categories of costs? Please discuss and explain the $22,081,000 increase in O&M reported for these two periods.

Response:
The "Total F/H O&M, Depr. and Taxes" costs included on MLS-4, Page 13 of the 2013 ES Reconciliation filing are actual costs and include Scrubber costs. The "Total F/H O&M, Depr. And Taxes" costs included on MLS-2, Page 5 of the 2013 Mid-Year ES Rate filing include seven months of projected costs and exclude Scrubber costs. The $22,081,000 difference is primarily due to Scrubber costs.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. OCA 1-034 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Reference MLS-3 page 1 line 60 and reference DE 12-292 Shelnitz and White's 6/13/2013 Technical Statement Attachment MLS-2 page 2, line 35. Forecasted Retail Sales were 3,941,402 per the 6/13/13 filing. Actual Retail MWH Sales were 168,741 lower at 3,772,661 representing 4.2% decrease from forecast. Please discuss underlying factors that resulted in forecast Retail MWH Sales exceeding actual.

Response:
PSNH's June filing used a migration assumption of 50.9%, based on the actual migration level experienced through May, 2013. From that time thru the end of 2013 migration increased to a peak value of 54.4%, before decreasing to 50.8% at the end of the year. The rough average over the period was approximately 52.8%, which is approximately a 3.7% increase from the 50.9% assumption used, aligning with the 4.2% identified in the question. Analysis performed by the company's load forecasting group indicates weather impacts increased actual loads over this period, on average. Nevertheless, PSNH believes the sales forecast exceeding actual sales was due primarily to the (net) migration of customers to and from default service during the second half of 2013. Also note that order 25,614 in DE 13-275 requires testimony and discussion on the methodology used for inclusion of a migration indicator in its 2015 ES rate filing in September, 2014.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/22/2014 **Date of Response: 09/19/2014**
Request No. OCA 2-001 **Page 1 of 5**
Request from: Office of Consumer Advocate

Witness: Christopher J. Goulding

Request:
Please provide an organizational chart of Northeast Utilities and all subsidiaries and affiliated entities. For each entity provide full legal name, address, year formed/acquired, primary business, and number of employees.

Response:
Please see the attached organizational chart and document providing full legal name, address, year formed/acquired, primary business, and number of employees.

NORTHEAST UTILITIES
SUBSIDIARIES AND AFFILIATES AS OF SEPTEMBER 3, 2014

Entity Legal Name (referred to as)	Address	Date Formed	Primary Busines	Number of Employees
Northeast Utilities (NU)	300 Caldwell Drive, Springfield, MA 01104	01/15/1927	Parent company of the NU system, one of the largest utility systems in the country and the largest in New England.	0
The Connecticut Light and Power Company (CL&P)	107 Selden Street, Berlin, CT 06037	06/22/1905	Connecticut's largest electric utility, serving approximately 1.2 million customers throughout the state of Connecticut.	1,587
Electric Power, Incorporated	107 Selden Street, Berlin, CT 06037	06/27/1951	Inactive specially chartered company.	0
The Connecticut Steam Company	107 Selden Street, Berlin, CT 06037	05/13/1965	Inactive specially chartered company.	0
The Nutmeg Power Company	107 Selden Street, Berlin, CT 06037	07/19/1954	Inactive specially chartered company.	0
Public Service Company of New Hampshire (PSNH)	780 North Commercial Street, Manchester, NH 03101	08/16/1926	New Hampshire's largest electric utility serving about 500,000 customers throughout the state of New Hampshire.	1,039
Properties, Inc.	780 North Commercial Street, Manchester, NH 03101	02/02/1924	Owns non-utility real estate in New Hampshire.	0
Western Massachusetts Electric Company (WMECo)	300 Caldwell Drive, Springfield, MA 01104	12/30/1886	Electric utility serving more than 200,000 customers throughout the western portion of the Commonwealth of Massachusetts.	314
NSTAR Electric Company (NSTAR Electric)	800 Boylston Street, Boston, MA 02199	01/08/1886	Electric utility serving more than 1.1 million customers in 81 cities and towns (including Boston) in the Commonwealth of Massachusetts.	1,747
Harbor Electric Energy Company	800 Boylston Street, Boston, MA 02199	12/22/1989	Provides retail distribution and other services to the Massachusetts Water Resources Authority.	0
Yankee Energy System, Inc.	107 Selden Street, Berlin, CT 06037	02/15/2000	Intermediate holding company.	0
Yankee Gas Services Company	107 Selden Street, Berlin, CT 06037	05/26/1955	Connecticut's largest natural gas distribution company, serving approximately 208,000 customers in 71 cities and towns in the State of Connecticut.	395
NSTAR Gas Company	800 Boylston Street, Boston, MA 02199	05/15/1851	Natural gas distribution company, serving approximately 300,000 customers in 51 cities and towns in the Commonwealth of Massachusetts.	436
Hopkinton LNG Corp.	800 Boylston Street, Boston, MA 02199	08/14/1970	Owns and controls liquid natural gas storage facilities used by NSTAR Gas during the winter heating season.	0
Yankee Energy Financial Services Company	107 Selden Street, Berlin, CT 06037	09/09/1992	Provided energy equipment financing. This company is in the process of winding down its business.	0
Yankee Energy Services Company	107 Selden Street, Berlin, CT 06037	07/02/1993	Provided energy-related services. This company is in the process of winding down its business.	0
NU Transmission Ventures, Inc.	107 Selden Street, Berlin, CT 06037	03/19/2010	Intermediate holding company.	0
Northern Pass Transmission LLC	780 North Commercial Street, Manchester, NH 03101	03/31/2010	Will construct, own and operate The Northern Pass transmission project with Hydro Québec.	0
Renewable Properties, Inc.	780 North Commercial Street, Manchester, NH 03101	07/18/2011	Owns real estate in New Hampshire in connection with activities related to The Northern Pass transmission project.	0

NORTHEAST UTILITIES
SUBSIDIARIES AND AFFILIATES AS OF SEPTEMBER 3, 2014

Entity Legal Name (referred to as)	Address	Date Formed	Primary Busines	Number of Employees
NU Enterprises, Inc. (NUEI)	107 Selden Street, Berlin, CT 06037	12/28/1998	Intermediate holding company for NU's competitive businesses.	0
Northeast Generation Services Company	107 Selden Street, Berlin, CT 06037	12/28/1998	Provides operational and reporting oversignt to E. S. Boulos Company.	0
E. S. Boulos Company	107 Selden Street, Berlin, CT 06037	01/10/2001	Provides electrical contracting services in New England.	27
Select Energy, Inc.	107 Selden Street, Berlin, CT 06037	09/26/1996	Previously provided energy services and held wholesale competitive energy contracts, of which the last one expired at the end of 2013. This company is in the process of winding down its business.	0
Select Energy Contracting, Inc.	107 Selden Street, Berlin, CT 06037	10/13/1994	Formerly engaged in HVAC and related work. This company is in the process of winding down its business.	0
NSTAR Communications, Inc.	800 Boylston Street, Boston, MA 02199	03/03/1997	Installs, owns, operates and maintains a wholesale data transport network for other telecom service providers in Boston to deliver voice, data, and other services to customers.	0
IP Strategy LLC	195 Church Street, P. O. Box 1950, New Haven, CT 06509	06/10/2014	Intellectual property rights holding company.	0
Northeast Utilities Service Company	56 Prospect Street, Hartford, CT 06103	09/03/1965	Provides centralized accounting, administrative, information resources, engineering, financial, legal, regulatory, operational, planning, purchasing and other professional services to NU and its subsidiaries.	2,858
The Rocky River Realty Company	107 Selden Street, Berlin, CT 06037	04/09/1923	Owns and leases non-utility real estate in Connecticut and Massachusetts.	0
HWP Company	300 Caldwell Drive, Springfield, MA 01104	01/31/1859	Owns limited, non-utility real estate in Holyoke, Massachusetts.	0
North Atlantic Energy Corporation	780 North Commercial Street, Manchester, NH 03101	09/20/1991	Owned PSNH's share of the Seabrook nuclear generating facility (Seabrook) which was sold to FPL in 2002. This company is in the process of winding down its business.	0
North Atlantic Energy Service Corporation	780 North Commercial Street, Manchester, NH 03101	04/01/1992	Was agent for the joint owners of Seabrook prior to its sale. This company in the process of winding down its business.	0
Northeast Nuclear Energy Company	107 Selden Street, Berlin, CT 06037	11/14/1950	Was agent for the joint owners of the Millstone nuclear generating facilities, which were sold to Dominion Resources in 2001. This company is in the process of winding down its business.	0

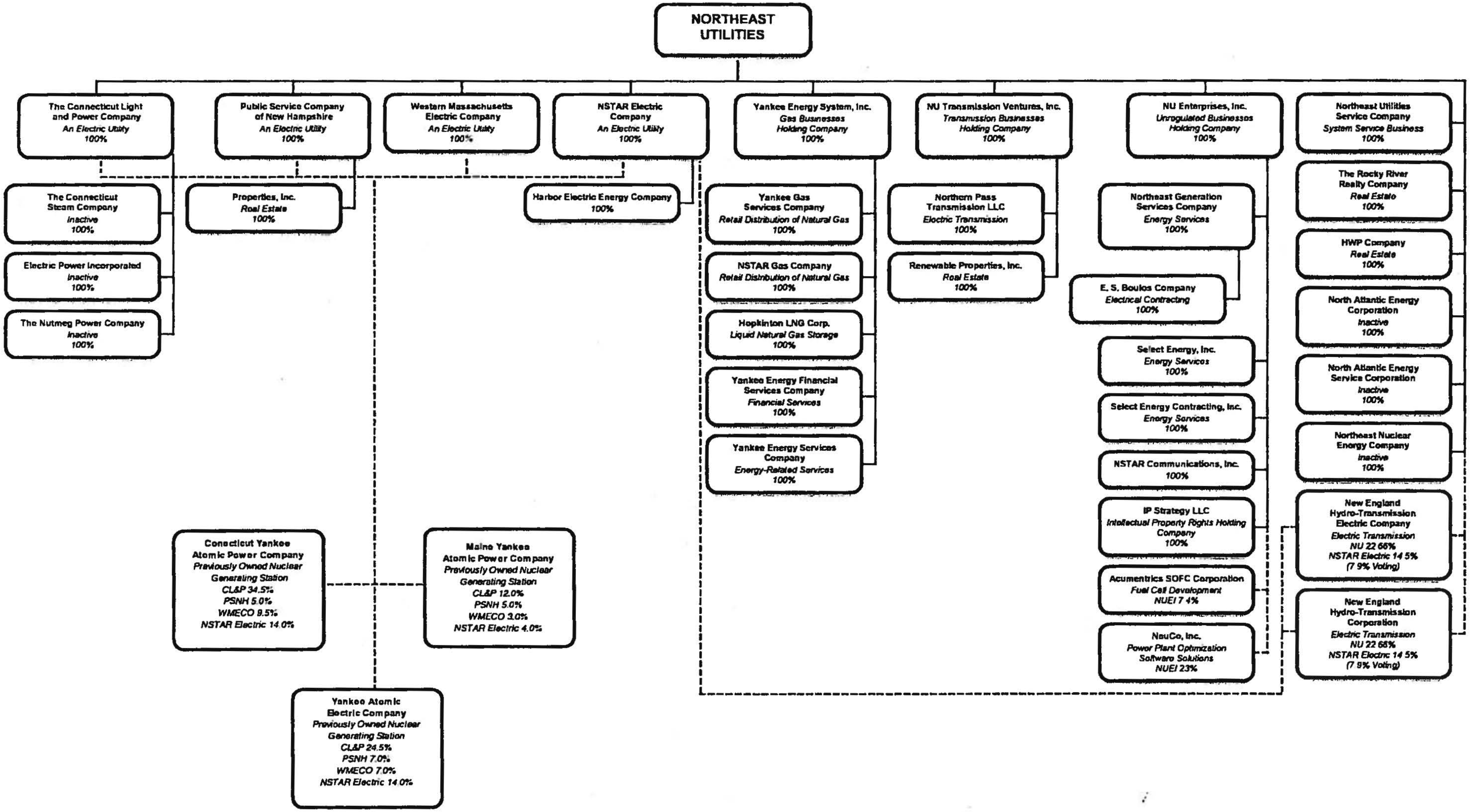
NORTHEAST UTILITIES
SUBSIDIARIES AND AFFILIATES AS OF SEPTEMBER 3, 2014

Entity Legal Name (referred to as)	Address	Date Formed	Primary Busines	Number of Employees
Partially owned affiliates:				
Connecticut Yankee Atomic Power Company	362 Injun Hollow Road, East Hampton, CT 06424	12/13/1962	Owned a nuclear generating plant that has been decommissioned. 63.0% combined voting power of CL&P, PSNH, WMECo and NSTAR Electric.	n/a
Maine Yankee Atomic Power Company	321 Old Ferry Road, Wiscasset, ME 04578	01/03/1966	Owned a nuclear generating plant that has been decommissioned. 24.0% combined voting power of CL&P, PSNH, WMECo and NSTAR Electric.	n/a
Yankee Atomic Electric Company	49 Yankee Road, Rowe, MA 01367	09/17/1954	Owned a nuclear generating plant that has been decommissioned. 52.5% combined voting power of CL&P, PSNH, WMECo and NSTAR Electric.	n/a
Acumentrics SOFC Corporation	20 Southwest Park, Westwood, MA 02090	08/18/1994	Fuel cell development company. Approximately 7.4% voting power through NUEI equity investment.	n/a
NeuCo, Inc.	12 Post Office Square, 4th Floor, Boston, MA 02109	12/20/1999	Provider of power plant optimization software solutions. 23% ownership interest by NUEI.	n/a
New England Hydro-Transmission Electric Company	40 Sylvan Road, Waltham, MA 02451	11/13/1984	Electric Transmission Company. 22.66% voting power of NU; 7.9% voting power of NSTAR Electric.	n/a
New England Hydro-Transmission Corporation	40 Sylvan Road, Waltham, MA 02451	12/27/1984	Electric Transmission Company. 22.66% voting power of NU; 7.9% voting power of NSTAR Electric.	n/a

Data Request OCA Set 2
Dated 8/22/2014
OCA 2-001
2-NU System Corporate Chart 2014.09.03

NORTHEAST UTILITIES SYSTEM CORPORATE CHART

AS IN EFFECT ON SEPTEMBER 3, 2014



Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/22/2014 | **Date of Response: 09/19/2014**
Request No. OCA 2-003 | **Page 1 of 53**
Request from: Office of Consumer Advocate

Witness: Timothy J. Griffin

Request:
Please state the date of the most recent depreciation study and provide an electronic copy.

Response:
Please see Attachment 1, the most recent depreciation study completed in 2003 as part of Docket DE 03-200.

PUBLIC SERVICE OF NEW HAMPSHIRE

DEPRECIATION RATE STUDY

**Depreciation Accrual Rates Relative
to Electric Plant in Service
at December 31, 2002**

MANAGEMENT APPLICATIONS CONSULTING, INC.

TABLES OF CONTENTS

August 28, 2003

Mr. Michael S. Duncan
Manager, Plant Accounting Services
Northeast Utilities Service Company
107 Selden Street
Berlin, CT 06037

Dear Mr. Duncan,

As authorized by your Company, Management Applications Consulting, Inc. (MAC) has completed a depreciation rate study on Public Service of New Hampshire (PSNH) electric plant in service at year-end 2002. The results of the study are contained in the attached report.

The study was accomplished by our organization with the assistance of your staff, for which assistance we are most appreciative. The study includes analyses of engineering and accounting data to aid in the development of appropriate average service life estimates, mortality dispersions, and net salvage estimates for each primary plant account. The methods used are those generally recognized in the industry.

Thank you for the opportunity to be of service and should you or your staff desire further discussions on the study, we will be pleased to meet with you or your staff.

Respectfully submitted,

MANAGEMENT APPLICATIONS CONSULTING, INC.

James H. Aikman
Managing Consultant

JHA/cmd

FOREWORD

This report presents the results of detailed studies of the life characteristics and net salvage of the depreciable electric utility property in service at December 31, 2002, of Public Service of New Hampshire. These average service lives, forecast retirement dates, retirement dispersions, and interim retirement rates and net salvage allowances are applicable until subsequent studies indicate the need for revision.

It is our opinion that depreciation accruals, based upon the factors presented in this report, will provide for the proper recovery of capital invested in depreciable property and the related net salvage value.

I. EXECUTIVE SUMMARY

A. Introduction

As authorized by Public Service of New Hampshire (PSNH), through the Northeast Utilities Service Company (NUSCO) as its agent, Management Applications Consulting, Inc. (MAC) has completed a depreciation accrual rate study of its depreciable electric utility properties in service at December 31, 2002. The study develops average service lives, mortality dispersions, and net salvage allowances (i.e., accrual rate parameters) for each depreciable plant account or sub-account.

The report presents the results of the study which include MAC's recommendations for the recovery of the depreciable electric plant investments of PSNH.

B. The Meaning of Depreciation

The essential purpose of depreciation accounting is to provide for the full recovery of the capital invested in certain property less estimated net salvage over the useful life of that property in a timely and equitable manner. Net salvage value (or net removal cost) is the gross salvage less the cost of removal realized upon retirement of the relevant the property.

The National Association of Regulatory Utility Commissioners (NARUC) and the Federal Energy Regulatory Commission (FERC) have defined depreciation as:

> "...the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric (gas) plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities (and in the case of natural gas companies, the exhaustion of natural resources)."

The study was prepared in accordance with this definition. In addition, the straight line method-remaining life technique-average life group (ALG) procedure of depreciation accounting has been used to develop the proposed accrual rates. In contrast to the "whole life" technique, the "remaining life" technique[1] is more appropriate for the utility industry in that it recognized the variance between the indicated (theoretical) depreciation reserve and the book depreciation reserve

[1] The New Hampshire P.U.C. has ordered this technique used in connection with prior electric plant depreciation cases.

(Accumulated Provision of Depreciation) accrued to date and automatically adjusts for such variances. Schedules which develop the remaining life accrual rates are included in this report, follow Section III.

C. General Description of the Depreciable Electric Utility Properties in Service at December 31, 2002

The Company's depreciable electric utility properties are categorized into five plant functions and numerous accounts and sub-accounts. The five plant functions are identified as:

1. Steam Production Plant

   The Company has 100% ownership in three fossil-steam generating plants, with a total output rating of 980.4 MW and 3.1433 % ownership of a 615 MW fossil-steam generating plant located in Yarmouth, ME.

2. Hydraulic Production Plant

   The Company has 100% ownership in nine hydroelectric generating plants, with a total output rating of 673.8 MW.

3. Other Production Plant

   The Company owns five oil-fired combustion turbine units. The total output rating of the owned Other Production Plant is 100.7 MW.

4. Transmission Plant

   The transmission system includes approximately 252 pole miles of 345 kV lines, 9 pole miles of 230 kV lines, 730 pole miles of 115 kV lines and 45 substations.

5. Distribution Plant

   The distribution facilities consist of 131 distribution substations, about 12,000 pole miles of primary overhead and about 50 circuit miles of primary underground distribution lines, 138,210 line transformers with a total capacity of 5,220 MVA, 540,000 meters, and street lighting facilities.

6. General Plant

   This plant function includes general structures, transportation and power-operated equipment, office furniture and equipment, communication equipment, and other facilities.

D. MAC's Study Procedure

MAC's study procedure is consistent with the generally accepted engineering and accounting procedures used to develop annual depreciation accrual rates. The methodology used in this study is briefly set out as:

1. Identification of depreciable property in the various property accounts

   This included a visit by a MAC engineer to some PSNH facilities to observe the physical condition of the facilities and the surrounding environment, and also to observe the company's maintenance and construction practices on the existing plant.

2. Collection and examination of historical data

   This included input from the appropriate management personnel regarding past practices and experience as well as future plans and expectations which might impact on the life, salvage or cost to retire the depreciable property. It also obviously included the collection and analysis of property accounting data.

3. Statistical analysis of the depreciable plant investments

   Depending upon the nature of the property in the given plant account, one of two life analyses methods was used to assist us in selecting mortality patterns and estimating average lives of the depreciable plant investments. These methods are identified below with brief descriptions of each.

   a. Forecast (Life Span) Analysis

      This method takes into consideration the effect of different vintages of investment that are expected to be retired in total at one point in time. It is particularly appropriate for analyzing specific location property such as production plants. The method has been accepted by all regulatory bodies with which we are familiar.

   b. Simulated Plant Record (SPR) Analyses

      The following simulation method is used where there is not a sufficient history of dated or aged plant investment and retirements to perform actuarial analyses.

      Balances Method (BAL)

      In the simulated plant record balances method, combinations of survivor curves and average lives are used to compute a series of annual plant balances. Each combination is then tested to find the one that leads to simulated year-end plant balances which most closely approximate the actual year-end book plant balances.

c. Iowa Curves

In the simulation analyses, Iowa Curves are used to define the dispersion type and related average service life. The Iowa Curves are standardized dispersion patterns which have been used extensively by both utility and regulatory staff depreciation analysts since their introduction by Iowa State University in the mid-1930's.

4. Evaluation of analysis indications, followed by their acceptance, modification or rejection

The historical-based indications derived from the BAL analyses described in Section 3, above, have been carefully scrutinized by MAC to ensure that the results generally portray the likely effect of current and project circumstances on the various property accounts, and that they are generally consistent with industry findings and expectations for similar equipment investment accounts. MAC determines whether to modify or reject the statistical conclusion based on its reliability in light of the following factors, among others:

a. The current and projected policies and plans for existing equipment as well as new or different equipment, and

b. The existence of non-homogeneous accounts or accounts with highly variable, erratic or limited retirement experience which would necessarily affect the reliability of the statistical indications.

E. Findings

Section III of this study, entitled "Interpretation of Findings", sets out the depreciation accrual rate parameters, i.e.; estimated average service lives, net salvage allowances, and where appropriate, Iowa Curves for each depreciable plant account or sub-account. Several accounts show an increase in the estimated average service lives and in many instances historical life analyses show increasing lives over those of the prior (EOY 1995) study. The increased negative net salvage[2] found in some accounts reflects both changing regulatory requirements and the increased labor costs for removing equipment and facilities.

[2] Net salvage is gross salvage less removal costs. Negative net salvage (cost to retire exceeds gross salvage) is also known as net removal costs.

The following table compares the depreciation accruals of this study to the accruals developed by applying the existing depreciation rates to the study plant balances:

Plant Function	Accruals With Existing Rates Applied to Plant Balances as of 12/31/2002 ($000's)	Accruals per Study Rates Applied to Plant Balances as of 12/31/2002 ($000's)
Steam Production	16,832,045	18,697,597
Hydraulic Production	524,715	515,162
Other Production	36,314	34,822
Transmission Plant	2,593,584	2,491,655
Distribution Plant	17,492,891	22,181,389
General Plant	3,486,539	3,861,463
Total	40,966,088	47,782,088

F. Recommendations

In light of the study's findings it is the opinion of MAC that PSNH should take the following steps in order to achieve the proper and equitable recovery of the depreciable electric plant investments and to assure that the depreciation element of the cost of service is properly allocated to the customers realizing the benefits of the plant:

1. Continue to use the average remaining life technique for computing book depreciation accruals by plant account. Because it is a function of the net unrecovered plant, this technique automatically captures any reserve variance in the remaining life accrual. This technique is consistent with the P.U.C.'s orders in other electric rate cases.

2. Maintain plant account level book depreciation reserves and compute depreciation separately for production plant locations. This will allow more accurate control of the process of recovery of capital.

3. Do another complete depreciation accrual rate study within no more than five years, i.e., on plant in service at year-end 2007.

4. As in the prior study, MAC continues to believe it's appropriate to depreciate non-fee land, i.e., land rights as does FERC and many state regulatory bodies. Accordingly, we have developed accrual rates for the Land Rights of Transmission and Distribution Land.

II. STATISTICAL ANALYSES

MAC System of Depreciation Programs

The procedures used to process and analyze large volumes of data are facilitated by a comprehensive group of computer programs which have been systematized and integrated to provide for orderly data collection and subsequent analysis by any of several statistical programs. This is the same system used in the 1995 study.

The data collected and audited for these studies, whether gross annual activity or actuarial activity, are established on magnetic files by identifiable "data sets" (accounts, subaccounts, specific equipment categories, or specific location properties). All transfer and adjustment activity is "recast" to affect original additions or retirements, producing adjusted historical activity as if such adjustments and transfers had not been subsequently required, and are documented in an audit trail listing. These data sets are then accessible by their identification numbers for Simulated Plant Record (SPR) analyses, for actuarial analyses, for specific location forecasts, and for theoretical reserve calculations, as well as for activity updating for future depreciation studies.

A. Simulated Plant Record Analyses (SPR-BAL)

The SPR-BAL analysis technique was applied to those accounts for which fully dated historical activity was not available. In total, 28 SPR data sets were updated for this study.

The standard of comparison in determining the Iowa curve best simulating the recorded balances using the SPR-Balances Method of analysis is the minimum sum of the squared differences between simulated annual balances and recorded annual account balances. Further considerations are the retirement index, which is the accumulated percentage retired from the oldest age (addition) studied, and the cycle index, which relates the age of the oldest addition to the projected total life span (maximum probable life) associated with the given curve and life combination. Maximum probable life is the age at which the survivor curve goes to zero percent surviving; e.g., a normal distribution has a maximum probable life twice its average service life.

In the SPR-Bal analysis, comparison was made to book figures at one-year intervals (i.e., each successive year) for various time spans, such as 30, 20, or 10 years. As MAC personnel performed the 1995 study, the SPR-BAL life analyses of property history up to EOY 1995 were reviewed in the current study, such that if changes or trends in property lives are taking place, they may be detected.

B. Life Span, Forecast Analyses

The life span, forecast procedure to estimate the average service life and the average remaining life is applicable to specific location properties where all finally surviving investments are likely to be deactivated in total at one point in time. This procedure is appropriate for such specific location facility investments as steam production plants. It is also known as life span analysis.

A primary element of this procedure is the projection of the time at which the surviving investments in a facility are expected to be deactivated in total; consideration is also given to the service period thus far of the currently surviving investments.

C. Salvage and Cost of Removal Analyses

The difference between gross salvage and cost of removal is net salvage. When the removal costs exceed gross salvage, the result is negative net salvage, also known as net removal cost or net cost to retire.

This report seldom makes mention of the net salvage components; that is, gross salvage and cost of removal; however, in arriving at the net salvage estimates, both components have been considered and studied.

The net salvage estimates contained in this study consider more than just the Company's actual recorded salvage and removal costs of a few years. Equally important as the Company's history is our experience with other electric utilities in this country. Also, as professional engineers, we are capable of making our own independent estimates of salvage and removal costs for much of the equipment.

Gross salvage and removal cost history was analyzed at the primary plant account level for the periods 1985 to 1995 and 2001 to 2002 and at the plant functional levels for the 1985 to 2002 period.

The analysis program develops the annual percentages of cost of removal, gross salvage, and net salvage and in various year bands of experience, similar to the rolling and shrinking bands of actuarial analyses. For example, two-year bands, like 2001 and 2002 or 1997 and 1998; or three-year bands, like 1995, 1996 and 1997, etc.

III. INTERPRETATION OF FINDINGS

For the Steam and Other Production Plant function, the average service life and average remaining life estimates of each investment group (account/location) have been developed by life span, forecast analysis. The life span is the period of years from the in-service date to the projected date of deactivation of the given facility, and it is a key element in the forecast analysis. Another element in the forecast analysis is the aged-surviving investments.

When any generating unit is within two years of its projected deactivation date, that deactivation date will be reviewed. If the unit is not to be deactivated as originally forecast, five years will be added to its life and the depreciation rate revised.

In no case should projected deactivation dates be construed as commitments to retire the facilities on the given dates. The projections are merely the best estimates of the PSNH staff, given current facts and other relevant projections.

A. Hydraulic Production Plant

It is our opinion the existing average service life estimates for the Hydraulic Production Plant accounts are within reason for the property and equipment. Also, the average life estimates are considered conservative in that the industry average estimates are lower. Hence, we propose no change to the existing/authorized bases for depreciation rates:

Account Number	Description	Iowa Curve
331	Structures and Improvements	58 S0.0
332	Reservoirs, Dams and Waterways	73 R0.5
333	Waterwheels, Turbines and Generators	61 S0.0
334	Accessory Electric Equipment	30 S0.0
335	Miscellaneous Power Plant Equipment	39 S6.0
336	Roads, Railroads and Bridges	50 SQ

The existing estimates include zero net salvage.

Schedule II of this report shows the remaining life accrual rates developed for each Hydraulic Production Plant. The composite remaining life accrual rate for Hydraulic Production Plant is 1.29% reflective of a composite average dollar service life of 58.2 years.

B. Steam and Other Production Plant

As mentioned in the narrative at the beginning of this section of this report, the same deactivation date review process employed relative to Other Production is the same as that used for Steam Production.

No interim retirements (retirements expected to occur between the study date [EOY 2002] and the projected deactivation date) are projected as a result of the limited retirements which have occurred to date, nor are any projected by PSNH engineers. Net salvage of zero is estimated upon the assumption a scrap dealer/demolition contractor would be willing to haul away all retired facilities for the salvage rights.

Schedule II shows the remaining life accrual rates and other details for each individual location. In composite, the average dollar service lives for all of Steam and Other Production Plant are about 21.1 and 32.2 years and the remaining life accrual rates, 4.45% and 0.39%, respectively. The respective accrual rates in the prior study were 5.10% and 4.42%.

C. Transmission Plant

The history of all Transmission Plant accounts was analyzed by the SPR-BAL method, as noted previously.

It should be noted that the NHPUC hearing regarding the 1995 study proposals resulted in a settlement in which the study proposed Transmission and Distribution Plant average service lives were raised 10 years; e.g., the Account 354 proposed average life of 43 years was raised to 53 years.

There is now more historic support for the average life estimates in the current study than for those in the prior study. However, due to the PSNH plan for considerable Transmission Plant capital activity in the next few years; the Company expects there will be much more Transmission Plant retirement activity in the next ten years than in the past ten. Retirement activity is what "drives" SPR-BAL life indications, so we expect the life analyses of the next two depreciation studies will show lower Transmission Plant average lives than the current study analyses. Specifically, PSNH plans to replace two of its 345 kV GE ATB circuit breakers each year (there are 11, in all). They plan to replace all 345 kV line relays by 2007 and to upgrade several 115 kV relays. They plan to replace several 115 kV coupling capacitor voltage transformers (CCVT) and lightning arresters. They plan to replace some 115 kV circuit breakers due to fault current limitations and thermal restrictions. They plan to replace the Merrimack 230 kV-115 kV autotransformer due to thermal limitations, with the existing transformer becoming a spare. It can be seen from the foregoing that the volume of retirements should increase.

Also, transmission line capital activity is increasing. Three lines (R187, R169 and G146) have been or are being rebuilt. In each case, the old lines have been or are being taken down. Further, the 115 kV lines between the Scobie Pond and Schiller Substations are expected to be rebuilt within the next five years, as is the I158 line between the Scobie Pond and the Huse Road Substations.

By comparison to industry average life estimates, we consider our current proposals to be conservative (long). It should also be noted that the accrual rate schedules of this report reflect the transfer of 34.5kV facilities from Transmission Plant to Distribution Plant.

1. Account 350.2 – Easements (Land Rights)

   We recommend that the Company commence recovery via depreciation of its investments in non fee land rights: easements. The FERC and many, if not most, states allow depreciation recovery of land rights.

   Although some claim that there is no basis for depreciating such investments as there is no determinable life for them, we dispute this claim. There may currently be no historical evidence by way of retirements to analyze easements by the traditional means to determine a historical life, but this does not mean that easements have an infinite life like land in fee. Land in fee does have an infinite life, but it generally appreciates in value while the value of easements generally depreciates over time.

   The Company has made investments in easements to serve its customers and the recovery of these costs should be considered an element of the cost of service. The time will come when the easements are of no benefit to the Company or its customers. At that time the Company will have unrecovered costs in an intangible asset which will be of no value; they will not be able to sell it, reuse it or junk it.

   Nobody can say when any or all easements will retire, the same as with most tangible assets. However, it is logical to expect that the generation, transmission and distribution of electricity as we know it today, is not likely to continue forever. Solar energy, fuel cells, hydrogen energy and other technological advances are on the horizon which may lead to considerably less centralized energy sources within 50 years or less.

   We recommend the amortization of transmission easements over a period approximating the expected life span of the associated overhead transmission lines, 65 years. The resulting accrual rate is 1.54%

2. Account 352 – Structures and Improvements

   Although the PSNH retirement history of Account 352 is like that of most of the industry—minimal, the best statistically ranked indications of the SPR-BAL life analyses do not support the prior 57-year R3.0 Iowa curve. The top ten "best-fits" range from a 40-year L5.0 Iowa curve to a 52-year R3.0, with the average of the top ten best-fits in the three analyses being a 43.3-year average life. Hence, we propose the accrual rate be based upon a 50-year L3.0 Iowa curve, a very moderate move towards the BAL life indications.

No change is proposed from the zero net salvage estimate of the prior study; however, we do consider zero to be a conservative estimate in that there is very little, if any, potential for salvage from the properties that make up Account 352. On the other hand, costs to remove are quite likely.

3. Account 353 – Station Equipment

Analyses of the PSNH history of Account 353 seem to point to very high average service lives and the average service life appears higher in the narrower bands (10- and 20-year) than in the wider (30- and 40-year) bands. Also, the analyses as of 2002 appear to indicate longer lives than those as of 1995, and the analyses as of 1995 show longer lives than did the 1992 analyses.

Based upon our years of experience, it appears that many people have difficulty understanding that we are attempting to estimate reasonable average service lives for equipment (such as that of Account 353) and that the "life" indications from SPR-BAL are average lives. Given that the bulk of the dollars (our unit of measure) in Account 353 represent power transformers and circuit breakers, it is impossible to accept the SPR-BAL average life indications of 70 years and more for such equipment as being realistic and projective of the future.

Mitigating the BAL indications is the likelihood of much shorter lives of the electronic equipment which comprises the Supervisory Control and Data Acquisition system (SCADA). It is likely that there have not yet been significant retirements from the SCADA system; when the retirements do begin to occur, they will cause the life analyses indications to decline. Also, typical industry estimates of average service lives for Account 353 are in the 35- to 40-year range. (Note the capital activity projections cited at the beginning of this report section.)

It is our opinion the continued use of the previously approved 55-year average life with an R3.0 Iowa curve will prove to be conservative.

We propose no change from the existing 20% net removal cost estimate.

4. Account 354 – Towers and Fixtures

We propose only a minor change from the previously approved 53-year R4.0 Iowa curve for Account 354; the SPR-BAL life analyses (top statistically ranked curves/lives) and our experience lead us to suggest a 50-year L4.0 Iowa curve.

Net salvage of 25% negative is estimated for all of Account 354, which is very conservative in view of the Company's realized net removal experience and our judgment.

5. Account 355 – Poles and Fixtures

Life analyses of the history of account 355 show a trend to lower lives. The last study was on plant at year-end 1995, and it estimated a 42-year average life for Account 355 which was raised to 52 years in the rate case settlement process. We find the current life analyses best statistical rank findings are curves with average lives of about 39 to 51 years. The vast majority of the account is 30 years old or less in that $30.7 million of the $44.1 million balance has been added since 1972; i.e., in the last 30 years. It is obvious from the SPR-BAL analyses these additions have yet to enter that period of their life when significant retirements begin to occur; once they do, life analyses should begin to show more realistic lives. Giving some recognition of the BAL life indications, we propose a 50-year R2.0 Iowa curve. The 50-year average life estimate is higher than the industry average estimate of about 40 years for Account 355, yet it is a decrease from the previously ordered 52-year life.

Negative net salvage of 40% is again estimated.

6. Account 356 – Overhead Conductors and Devices

Like Account 353, the results of the life analyses of the history of Account 356 are not representative of the likely future of these lines, as the (top ranked) average life indications are in the order of 70 to 130 years. Assuming the structures on which these lines are mounted realized average lives of 30 to 50 years, it is extremely unlikely the conductors will realize average lives twice as long. Also, the conductor account has realized only about $2.6 million of retirements since 1965, during which period $37.8 million was added. As in Account 355, it is likely these additions have yet to begin to realize significant retirements, and until this happens, the SPR-BAL analyses are unlikely to indicate realistic average lives. Hence, our very conservative proposed curve type is a 50-year S4.0, the same life as previously ordered.

Net removal cost of 20% is estimated in consideration of the experience realized by PSNH.

7. Account 357 – Underground Conduit, and Account 358 – Underground Conductors and Devices

No SPR-BAL life analysis was attempted on Account 357 as there has been so little capital activity, only $2,790 added in the past 30 years, and the last retirements being in 1993 and 1971. The oldest addition is vintage 1951, which means the 1993 retirement could not possibly be over 42 years old at retirement. We propose no change to the previously ordered life, i.e., a 61-year SQ curve.

The Account 358 history has also been very limited, but SPR-BAL life analyses were attempted; however, the best-ranked average life indications were 72 to 101 years. The industry average estimate of average life for Account 358 is about 40 years. As with Account 357, we propose no change from the 49-year life previously authorized; the associated Iowa curve is the R4.0.

Similarly, we propose no change from the previously authorized net removal cost estimates of 10% and 5% for Account 357 and 358, respectively.

8. Account 359 – Roads and Trails

The 65-year SQ pattern previously ordered is again proposed for these properties as is the zero net salvage estimate. This estimated life is conservative in that it exceeds typical industry average estimates.

D. Distribution Plant

Note that the accrual rate schedules of this report reflect the anticipated transfer of 34.5 kV facilities from Transmission Plant to Distribution Plant. For the purposes of this study, those facilities transferred into Distribution reflect the depreciation accrual rates of Transmission Plant.

1. Account 360.2 – Easements (Land Rights)

We recommend that the Company recover the investments in Distribution Easements via depreciation.

The same arguments made for Transmission Easements apply to Distribution. In addition, consider the consequences of not recovering the cost of easements while they serve the customers' needs. When the easements are eventually retired the Company will have no offset in the depreciation reserve and will likely have to request a special amortization to offset the retirements. This would mean that the rate payers at that time would be paying for an element of cost of service which provides them absolutely no benefit.

As with Transmission Easements we recommend an amortization over 65 years resulting in an accrual rate of 1.54%.

2. Account 361 – Structures and Improvements

The PSNH retirement experience by year of activity varies in volume and is sporadic, typical in the industry for this account. In our opinion, the SPR-BAL life analyses are indicative, if not conclusive, in that most average life indications are in the 45- to 50-year range. This, plus the industry average estimate of about 45 years leads us to propose a 50-year average life estimate with an L3.0 Iowa curve, the same as that proposed for the like property of Account 352. Zero net salvage is estimated.

3. Account 362 – Station Equipment

Current SPR-BAL life analyses indications lead us to conclude a change is warranted from the prior study proposed 44-year life and from the previously authorized 54-year average life estimate for Account 362. A 50-year R1.0 Iowa curve is proposed. We do not propose the same 55-year life as for the like Transmission account (353) as it has been our experience that Distribution Station Equipment naturally experiences more turnover, more changes than Transmission Station Equipment and, hence, a lower life. The same can usually be said of all Transmission accounts compared to the like accounts of Distribution.

Net removal cost of 10% is estimated, conservatively based on the Company's history of salvage and removal costs. This is a decrease from the (5) % net removal cost estimate of the prior study, reflective of the PSNH recent realized net removal costs.

4. Account 364 – Towers and Fixtures

Based upon the SPR-Bal life analyses, the historical average service life of Account 364 realized by PSNH is in the order of 23 to 32 years. Our proposal is a 26-year S1.0 Iowa curve which is below the previously authorized 32-year life.

We propose no change to the existing authorized 15% net removal cost estimate. PSNH has realized net removal cost of approximately that level in recent years. It is likely the net removal cost should be increasing, due to environmental requirements, even without consideration of removal labor cost increases; however, the PSNH recent history does not conclusively support the logical/typical net salvage decrease.

5. Account 365 – Overhead Conductors and Devices

The average life estimate in the previously referred to study of 1995 plant was 33 years, in contrast to the settlement-based 43-year life authorized by the NHPUC. The current SPR-BAL life analyses do not support the prior study 33-year average life estimate nor the 43-year life; our proposal is a 36-year R2.0 Iowa curve which is founded primarily upon the current SPR-BAL analyses results. Further, the industry average estimate of average service life is about 35 years.

Net removal cost of 20% is our estimate for Account 365, in view of recent net removal cost realized by PSNH (on the order of 20% to 40%). Our estimate is an increase of 5% over the existing net removal cost estimate.

6. Account 366 – Underground Conduit

As noted in the prior study, the dollars of Account 366 plant in service are definitely in their infancy in that the additions of the past 30 years constitute about 82% of the account 2002 balance; i.e., $7.4 million of additions vs. the $9.1 million balance. Retirements have not grown proportionately, and it is not our opinion this leads to non-predictive, questionable life analysis results; i.e., total Account 366 retirements in the 30-year period 1973 to 2002 have been $309,000. The era of significant retirements is yet to occur. In spite of this, the BAL analyses provide some support for the proposed 70-year R3.0 Iowa curve. The industry average estimate is about 55 years.

Although underground facilities like conduit and manholes are seldom removed upon retirement, there are obviously some costs to retire them. PSNH has experienced net costs to retire of about 44% in the past two-year period. As a result of this and longer-term history, we propose the depreciation rate net salvage component be revised from (10) % to (15) %.

7. Account 367 – Underground Conductors and Devices

We propose a 40-year R2.5 Iowa curve for Account 367; this is a minor change from the 37-year prior study life estimate. The settlement-based authorized life in the previous NHPUC case was 47 years. The SPR-BAL life analyses show no clear life trend, but do support a life above 37 years. Industry average estimates for Account 367 are about 35 years.

Our 15% net cost to retire estimate stems from the PSNH actual experience which includes 2001-2002 experience of over 100% net removal cost. Underground conductor can be removed from ducts, but the removal and rewinding of it onto reels for transport and disposition is likely to at least offset any salvage. Furthermore, underground cable is encased in heavy plastic insulation, or lead, or it is paper-wrapped such that to salvage any copper or aluminum, one must remove the wrapping. This can be a relatively costly effort. The circumstances as to the net cost to retire are similar to those previously discussed relative to Account 366 – Underground Conduit.

8. Account 368 – Line Transformers

Like most modern manufactured products, line transformers built within the last few years are designed and built with closer tolerances; that is, the engineering design and manufacture is such that the transformers cannot withstand the overloads that older transformers could. Therefore, one would expect to see a downward trend in life. On the other hand, there are procedures employed now by utilities which work to offset the limitations of closer tolerances. For example, there are transformer load management programs which enable the utility to better predict the loads to which individual transformers are likely to be subjected. This enables the utility to more accurately estimate the needed kVA capacity, which minimizes transformer overloads and the resulting failures; therefore, saving on capital expenditures. The capital savings come about in part because the utility can buy smaller kVA transformers for many locations without fear of overload and premature failure.

Our interpretation of the life analyses is that the average service life estimate for Account 368 should be revised upward from the prior study estimate of 35 years to 40 years; i.e., a 40-year R2.0 Iowa curve. The settlement-based NHPUC-authorized life is 45 years. Factors supporting the conservatism of our life estimate include the PSNH engineers' estimate of life of about 30 years and the industry average estimate of 32 years.

As the Company does not charge any costs to retire (transformers) to the Accumulated Provision for Depreciation and gross salvage is essentially zero, we suggest zero net salvage is appropriate.

9. Account 369 – Services

We propose a 33-year R1.0 Iowa curve for Account 369 which is a significant change from the prior study life estimate and is two years below the previously authorized, settlement-based estimate. It is our opinion the current SPR-BAL life analyses support the 33-year life estimate. To put the life estimate into perspective, keep in mind that the 33-year estimate is an average life estimate and with the R1.0 Iowa dispersion, the oldest possible survivor is projected to be about 66-years old at retirement; e.g., of the $5,047,277 added to Account 369 in 2002, $1,053 is projected to survive until the year 2067.

We propose a minor change from the prior study 40% net cost to retire estimate to 45%. PSNH has realized net cost to retire in excess of 45% in the recent past.

10. Account 370 – Meters

The 35-year S6.0 Iowa curve proposed for Account 370 stems from two primary considerations; one is the SPR life analyses of the account history and the other is the projections as to expected lives of the equipment. This is the same life as proposed in the prior study; the settlement-based, authorized life is 45 years.

The equipment of PSNH in Account 370 is changing from mostly the traditional electro-mechanical watt-hour meters to more and more electronic meters and electronic metering equipment. The electronic meters and equipment are capable of doing more/providing more data, but they are not expected to realize the lives of the traditional electro-mechanical meters; i.e., more technological obsolescence is likely. Typical average life estimates within the industry for the electronic meters and equipment are about 15 years, making our proposal appear extremely conservative.

Zero net salvage is appropriate as removal costs relative to retired meters are charged to an operating account, rather than capital.

11. Account 371 – Installations on Customers' Premises

The 17-year S3.0 Iowa curve proposed for Account 371 is reflective of the SPR-BAL life analyses. These analyses indicate average lives from a low of 14 years to a high of 18 years. The equipment is similar to street lighting equipment but is more subject to the whims of the public as it is located on customers' premises; hence, we often find a shorter life for Account 371 than for Account 373. Such is the case in this study.

As the Company net salvage experience is negative in most years, we again recommend (15) % net salvage for Account 371. It is our opinion the net salvage for Account 371 should be relatively close to that of Street Lighting, Account 373, due to the similarity of equipment.

12. Account 373 – Street Lighting and Signal Systems

SPR-BAL life analyses of four bands of Account 373 experience, 1963 to 2002, 1973 to 2002, 1983 to 2002, and 1993 2002, indicate the previously authorized 20-year average service life to be too high. The average life findings are a maximum of 21 years and a minimum of 18 years.

Based primarily upon the foregoing, we propose a 20-year R2.0 Iowa curve for Account 373.

Net salvage of (15) % is estimated, in consideration of the Company's far more negative recent net salvage experience. The prior study estimate was (10) %

E. General Plant

There are only two plant accounts for which we propose a change from the average lives and net salvage ordered by the NHPUC, Account 390 – Structures and Improvements and Account 391 – Office Furniture and Equipment.

For Account 390 we propose a 40-year R1.5 Iowa curve, up from the authorized 35-year average service life. This is due to 2002 addition of $32 million which represented the renovation of an old power plant structure into offices. With a 50-year average life estimate for the $32 million and historical analysis based 32-year estimate for the remaining $12 million, the weighted composite life is 45 years. An adjustment to 45 years from 35 years would be about a 29% adjustment; hence, we propose a more moderate adjustment to 40 years. Zero net salvage is again our estimate.

For Account 391 the Company has segregated it into P.C. Equipment and All Other; the respective balance in each group at year-end 2002 is $6.0 million and $8.9 million. Using a historical-based 23-year S4.0 Iowa curve for All Other and a 4-year SQ Iowa curve for PC Equipment, a weighted composite 7.9-year life develops for the total Account 391.

Reflective of PSNH history, we propose 2.0% net salvage for All Other. Zero net salvage is estimated for PC Equipment.

We propose no change from the previously authorized parameters for the remaining accounts which are:

Account/Group	Iowa Curve	Estimated Net Salvage, 0%
392 Autos	8 SC	10
392 Light Trucks	9 SC	10
392 Heavy Trucks	14 SQ	10
393 Stores Equipment	25 SQ	0
394 Tools, Shop & Garage Equipment	24 SQ	10
395 Laboratory Equipment	28 SQ	0
396 Power Operated Equipment	10 SQ	0
397 Communications Equipment	18 L4.0	0
398 Miscellaneous Equipment	20 SQ	0

APPENDIX – A

JAMES H. AIKMAN
Managing Consultant

Over thirty years of experience devoted to the public utility industry; recognized as an expert in the field of depreciation. Specializes in depreciation studies, independent engineer's certificates, restatement of property values, and appears as an expert witness. Has performed more than 200 depreciation studies for gas, electric, steam and water utilities and served more than 50 clients, domestic and international.

EXPERIENCE:

MANAGEMENT APPLICATIONS CONSULTING, INC.
Reading, Pennsylvania

MANAGEMENT RESOURCES INTERNATIONAL
Reading, Pennsylvania
Vice President

Gilbert Associates Inc.
Reading, Pennsylvania
Manager Depreciation Services
Senior Consultant
Project Manager

Missouri Public Service Commission
Jefferson City, Missouri
Staff Engineer

Engineering Service Corporation
Decatur, Illinois
Consulting Engineer

Warren H. Hagan, Consulting Engineer
Decatur, Illinois
Consulting Engineer

United States Navy Civil Engineer Corps
Long Beach, California
Public Works Engineer

CAPABILITIES:

Depreciation Studies

Collection of Property Data. Directs the collection of property data necessary for depreciation study databases.

Average Service Life. Estimates average service lives using actuarial, simulated plant record, life-span forecast analyses and judgment.

Gross Salvage and Removal Cost. Performs salvage and removal cost studies to aid in forecasting future salvage and removal costs.

Theoretical Reserve. Prepares theoretical depreciation reserve studies to evaluate and/or allocate book depreciation reserves.

Inspections. Performs property inspections to aid in average service life, salvage and removal cost estimation.

Valuation Studies

Prepared valuations of tangible assets of utilities to develop fair market value and international value to third-world nations. International value studies typically incorporate current pricing and cost trending offset by judgmental depreciation.

Independent Engineer's Certificates

Prepares Independent Engineer's Certificates involving detailed field inspections, review of plant accounting records and preparation of records to reconcile assets reported in the indentures with the plant accounting records.

Expert Testimony

Has appeared as an expert depreciation witness before seventeen state utility regulatory agencies, the Federal Energy Regulatory Commission, the Nova Scotia Board of Commissioners of Public Utilities, and the City of New Orleans.

EDUCATION:

B.S., Civil Engineering, University of Illinois. Numerous technical short courses and seminars.

REGISTRATION:

Licensed Professional Engineer: Illinois, Missouri, Pennsylvania, and Virginia.

PROFESSIONAL ASSOCIATIONS:

American Society of Civil Engineers
Society of Depreciation Professionals

APPENDIX – B

APPENDIX

Life Analysis of Utility Plant for Depreciation Accounting Purposes by the Simulated Plant-Record Method

By Alex. E. Bauhan

Chief Plant Accountant, Public Service Electric and Gas Co.

Presented at National Conference of Electric and Gas Utility Accountants, American Gas Association—Edison Electric Institute, Buffalo, N. Y., April 8, 1947.

Foreword

This paper deals with a trial and error method of discovering the mortality characteristics exhibited by utility-plant history, and is based on experience in a current extensive study. It is an elaboration of the "indicated survivors" method described in the 1943 report of the Committee on Depreciation of the National Association of Railroad and Utilities Commissioners. In any depreciation accounting policy which gives heed to experienced plant-mortality characteristics, the method of reading the past here presented is worthy of consideration; frequently there is no alternative to its use.

Present-day requirements in the matter of depreciation accounting for utilities quite often involve estimates of the average life of various classes of utility plant, but it is frequently not recognized that if depreciation accounting for a group of utility-plant units is related to the average life, it must also be related to the "mortality dispersion" of that plant. The manner in which the retirement dates of a group of related plant units, installed in a given year, distribute themselves in the years before and after the average age of retirement, i.e., mortality dispersion, has a marked effect on the theoretically required reserve under any group-depreciation-accrual plan associated with estimated average life.

Such a reserve determination is likely to be a greater misstatement due to hitherto common errors in estimating mortality dispersion than in estimating average life. A determination made in disregard of the dispersion of retirements, if it pretends to be associated with life of plant by the ordinary straight line or sinking fund plans of accrual, is without validity. The range between an alleged theoretical reserve requirement calculated without regard for mortality dispersion and one giving proper attention to it may be as much as two to one.

If necessary estimates of mortality dispersion as well as average life are to be drawn from past plant experience, methods of life analysis which tell us how the retirements of an installation "vintage" are distributed through the years, such as the here-described plant-record simulation method, are essential. The so-called turnover methods which undertake to discover average life directly from the relative behavior of year-by-year additions, retirements, and balances, and which, at least in their present stage of development, do not divulge mortality dispersion, are therefore of limited usefulness. By the application of actuarial principles, as used for life insurance purposes, information as to mortality dispersion as well as average life is usually obtainable, and this is the method commonly used.[1] But the actuarial method, which requires a knowledge of the installation date of each item of retired and surviving plant, is frequently not available because installation dates are not obtainable or because the labor of discovering them in addition to that involved in the pursuit of the method is too great. Fortunately, in such cases, not to mention other reasons why the method might be preferred, the desired results can be generally obtained, if at all obtainable, by what has been called the "indicated survivors method," but which is here designated as the "simulated plant-record method" with a broader implication to be explained later.

This paper undertakes to explain that method, along with various essential improvements developed in connection with its application to an actual extensive analysis of electric and gas plant. With some background mention of the phenomenon of utility-plant-mortality dispersion, the paper not only states the principles involved in the simulated plant-record method, but gives some of the details of computation procedure which have been found helpful. It further presents indices by which the trustworthiness of the results can be judged and correctly interpreted.

Mortality Dispersion

The underlying theory of the simulated plant-record methods depends on a concept of each year's additions, followed by the characteristic year-by-year retirement of those additions. Records in either monetary units or physical units may be thought of, but ordinarily only monetary records are adequately available in practice. The year-by-year retirements of the plant additions made in a particular year have been found to be distributed usually in some such manner as is illustrated by the bar diagram marked "Annual Retirements" in Figure 1.[2] A smooth curve connecting the ends of the bars would be the retirements-frequency-distribution curve. This diagram represents the phenomenon of mortality dispersion, recognition of which is so essential to any proper consideration of group-plant depreciation.

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[1] See *An Appraisal of Methods for Estimating Service Lives of Utility Properties*, prepared by cooperating committees on depreciation, American Gas Association—Edison Electric Institute, 1942.
Also, Report of Committee on Depreciation, National Association of Railroad and Utilities Commissioners, 1943.

[2] *Life Expectancy of Physical Property Based on Mortality Laws* by Edwin B. Kurtz, Ronald Press, 1930.
The Science of Valuation and Depreciation by Edwin B. Kurtz, Ronald Press, 1937.

The upper curve marked "Survivors" is obtained by subtracting from the original additions the accumulated annual retirements as obtained by adding the year-by-year values of the "Annual Retirements" curve. For any year, it shows how much of those original additions remain. In generalized form the annual retirements and survivors are expressed in per cent of the original additions for the various percentages of average life.

Several families of generalized mortality dispersions have been developed. The most generally known and used are those published by the Iowa Engineering Experiment Station, frequently called the Iowa type curves.[3] They are reproduced in Figures 2, 3, and 4. The standardized types developed by Lawrence S. Patterson, of the New York State Department of Public Service, have been reported in the NARUC Depreciation Committee 1943 Report. Some of these extend into a range of extremely wide dispersions not covered by the Iowa types and are therefore particularly useful in utility work. Recently a family of left-moded generalized dispersion types, based on the normal probability distribution truncated at the left and adjusted to unit area, has been introduced by C. Beverley Benson of the New York State Department of Public Service.[4] Individual companies and consultants have also developed dispersion types based on their own experience.

Recognition of mortality dispersion and use of standardized types facilitate an understanding of the methods by which average life and mortality dispersion are deduced from the records of annual plant additions, retirements, and balances. Pictures of successive years' additions with their respective retirements can be imagined as overlapped to give a composite of annual retirements which is a function of the succession of known additions of previous years and of the imagined or assumed average life and mortality dispersion. Alternatively or supplementally, the concept may be the survivors of each year's additions. (Such survivors, of course, being the original addition less the accumulated year-by-year retirements associated with that addition.) In either case, the comparison of this imagined or assumed picture with the actual history of the account is the basis of simulated plant-record method of life analysis.

Principle of the Simulated Plant-Record Method

The principle of the method as applied to balances (survivors) is described in the 1943 report of the Committee on Depreciation of the National Association of Railroad and Utilities Commissioners, in which it is called the "indicated survivors method."[5] The designation "simulated plant-record method" as here used is offered as more appropriate for the reason that the principles of the method apply equally well and quite similarly to comparisons of calculated and actual periodic retirements and of calculated and actual accumulated retirements. Henry R. Whiton of Gulf States Power Co., Beaumont, Texas, has developed the retirement approach in an important practical application. There is no indication of any significant difference in the results between the simulated balances and the simulated retirements procedure. Applied to plant records having stable life and mortality dispersion characteristics, they yield identical answers. This writing will, however, describe the method in reference to only balances, but with appropriate changes in the quantities referred to, the description of the method as to retirements would follow along the same lines.

The essence of the simulated plant-record method is that an effort is made by trial and error to duplicate the year-by-year balances of the account by a series of corresponding calculated, or "simulated," balances arising from the assumption that each year's actual additions were retired in accordance with a selected pattern of average life and mortality dispersion. Successive pattern selections are tried until a pattern is found which results in a series of year-by-year calculated balances simulating the progression of actual balances as closely as possible. That best fitting pattern is deemed to represent the experienced average life and mortality dispersion of the account.

The method requires that the actual annual gross additions be known or estimated quite far back. (Fortunately, it operates in such a way that if there are errors in any estimate of small early additions, the result is not materially influenced thereby.)

The assumed patterns of average life and mortality dispersion are, in practice, selected from a set of precalculated tables based on some family of standardized dispersion types, such as the Iowa types. For a given average life, and for a given type of mortality dispersion, these tables show the percent of a year's additions which survives in each succeeding year.

By multiplying the known additions of a particular year by the successive percentages shown in the selected survivors table, the balance which would result from that particular year's additions in each succeeding year, if the selected pattern of life and dispersion had operated, is obtained. Thus, for additions made in 1901 (assuming that 1901 is the first year of recorded additions), the amount surviving in each succeeding year up to the present is calculated. Similarly, for the additions made in 1902, the survivors of each succeeding year are calculated, and so on for each year's additions. The calculations can be recorded on a columnar sheet, such as is pictured in Figure 5, in which the additions of each year are listed in a column at the left. A column is provided for the survivors in each calendar year. Thus, by the aforementioned multiplication of a given year's additions by the surviving percentage for each succeeding year, each line can be filled in across the sheet. The sum of any survivors column on the sheet will then give the total calculated survivors as of the year of the column heading. That sum of survivors, or simulated balance, is compared with the actual

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[3] "Depreciation of Group Properties," by Robley Winfrey. Bulletin 155, Iowa Engineering Experiment Station of Iowa State College of Agriculture and Mechanic Arts, 1942.

[4] As witness for Public Service Commission of State of New York in Case No. 8858 concerning New York Water Service Corp. The same family appears in Case No. 12455 concerning Consolidated Edison Co.

[5] The NARUC report refers to the basic idea as it appears in an article by Cyrus G. Hill, "Depreciation of Telephone Plants," *Telephony*, Mar. 18 and 25, 1922. But Hill's procedure yields only average life or dispersion type, when the other of the two is known. As a solution for both variables it is indeterminate. The reason for this is that it uses only a single time of comparison between calculated and actual balances, rather than making the comparison over an extended term. The Hill procedure was used in testimony of company witness in New York State Public Service Commission Case 8230 re New York Telephone Co. and by C. Beverley Benson as commission witness in NYPSC Case 8490 re Syracuse Lighting Co., and in NYPSC Case 8403 re Queens Borough Gas and Electric Co. In the latter case, p. 3609 of testimony, and in State of Ohio Public Service Commission Cases 11001, 11218, and 11442 re East Ohio Gas Co. v. City of Cleveland, p. 38 of written testimony, Benson mentions the comparison of calculated with actual balances at more than one point of time. This is the essential fundamental feature of the method reported in this paper.

balance for the corresponding year.

If the simulated balances for an extended number of years duplicate the actual balance history, we know that the actual experience of the account reflects the assumed average life and assumed type of mortality dispersion. If this calculation does not duplicate the actual balances, the calculation must be repeated with a different assumed life or a different mortality dispersion or both. If the second calculation still does not duplicate the actual experience, another trial must be made, and so on.

The usual procedure has been to make this comparison graphically; that is, the curve of the actual balance is drawn on coordinate paper and the calculated results for each trial are plotted. When the plotted points for a particular trial fall closer to the actual line than for any other trial, that trial is said to represent the average life and mortality dispersion of the plant. However, this method is rather crude in that the distinction between the best fit and several inferior fits is frequently not discernible, and, of course, the judgment of the observer enters into such a determination. Deciding between two close fits is not, as might first be supposed, a matter of choosing between two average lives which are close to each other. The average lives of two close fits may be quite far apart. The reason for this will be apparent from later discussion of Multiple Indications.

A more precise and more objective comparison is by the use of the least squares method, which is commonly used for curve-fitting purposes. By this method, the year-by-year differences between the calculated and actual balances are observed; then, to accentuate the larger discrepancies, the differences are squared. The trial which shows the smallest sum of squared differences is deemed to be the best fit and to be indicative of the average life and mortality dispersion of the account.

The result of such a trial and error determination of the best fitting average life and mortality dispersion is illustrated in Figure 6, plant data for which were taken from the 1942 Report of the Depreciation Committees of the American Gas Association and Edison Electric Institute for the purpose of comparing the results of the turnover methods of life analysis.

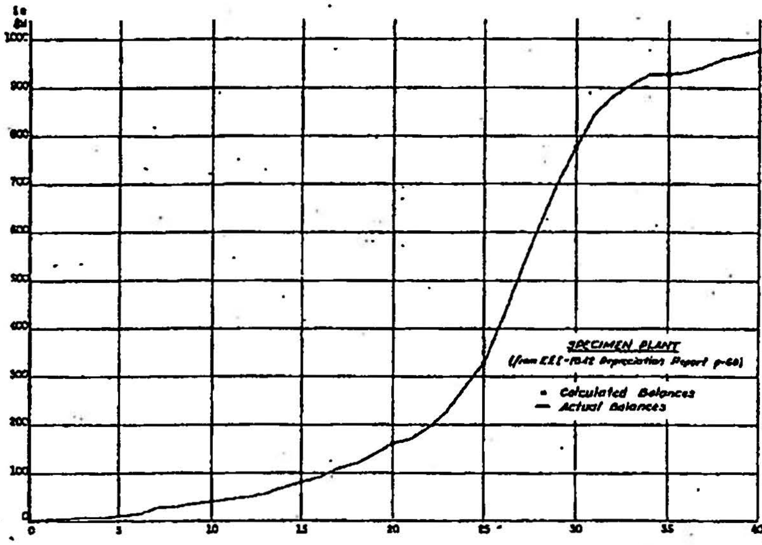

Fig. 6—Comparison of Calculated Balances and Actual Balances. Calculated values were computed from each year's additions on the assumption of a 20-year average life and mortality dispersion of type Iowa S1½. This assumption was found to give the best fit after about 50 trials of various lives and mortality-dispersion types.

In this case, after some 50 to 60 trials of various life and mortality dispersion patterns, by a calculator who was not informed as to the source or life characteristic of the data, the best fit was found to be an average life of 20 years with mortality dispersion of type Iowa S1½. Balance comparisons were made in only every fifth year of the last 20 years. Figure 6 shows that the calculated balances based on the 20-year S1½ assumption agree almost perfectly with the corresponding actual balances.

Survivors Tables

Before the simulated plant-record procedure is started there should be available not only a suitable statement of annual additions and balances for the plant under consideration but also, as stated earlier, a set of survivors tables—showing the per cent of plant installed in any year which survives at each age year — for each of the patterns of average life and mortality dispersion which are to be tested for fit with the plant record.

Figure 7 shows a page from a set of such tables based on the mortality-dispersion curves of the Iowa type. If use is to be made of the Iowa-type curves in any extensive study of utility-plant lives and dispersions, such survivors-per cent tables will be wanted for most of the 18 Iowa types of mortality dispersion for each average life in the range from approximately seven years to 60 years. The wider dispersion types will be needed up to 100 years. At greater or fractional average lives tables can be drawn up as required. Several intermediate dispersion types will also be found necessary, e.g., type R1½, which may be taken as having survivors midway between R1 and R2, and L½, which lies between Lo and L1. Type GC of the Patterson family, reflecting a uniform dispersion of retirements, is likely to be required for the entire range of average lives. Type S-½, referring to a curve midway between So and Patterson GC, will be useful. As many hundreds of tables are required, the labor involved in their initial preparation is considerable. It would be helpful if suitable and generally acceptable tables for the many combinations of average life and mortality dispersion could be published.

The physical arrangement of the tables is important. In any extensive study it is out of the question, because of the labor involved, to rewrite the table on a computation form every time a computation is made. The tables should be written, photographed, or printed on stiff durable paper, or on plastic coated paper, and then cut into so that each strip will show the survivors percentages corresponding to each age-year for a particular pattern of average life and mortality dispersion. Survivors need not be shown for more than 55 or 60 years, if the dispersion extends beyond such an age, unless it is expected to work with plant histories which include a greater span of years. Assuming that the work sheets will show additions chronologically downward, and this is believed to be the best arrangement, the survivors-table strips should run upwards by ages and the line spacing should be identical with that on the work sheets. Thus, the survivors percentages can be used as multipliers of annual additions by simply laying the strip alongside of the additions column without the necessity of rewriting the survivors percentages.

The tables should show per cent survivors at mid-year intervals. This convention is desirable because, in order to facilitate calculation, it can be assumed that all the additions made at various times during a calendar year are equivalently represented by a single installation on July 1. The survivors of these additions may therefore be considered to be one-half year old at the end of the first year, 1½ years old at the end of the second year, etc. It follows that the survivors tables are properly set up at the half-year ages.

Orderly filing of the survivors table strips facilitates their use. A visible index cabinet, using a file pocket deep enough to carry the length of the strip (10 or 11 inches) and wide enough for 0 strips, with celluloid-holding strips at the top and bottom of the pocket, is one suggestion.

Term of Balance Comparisons

A decision which must be made before survivors calculations are started is the extent of and the intervals at which points of comparison between actual and calculated balances will be made. That is, shall the comparison be of annual balances throughout the entire history of the account, as may have been inferred from the previous discussion, or merely between 1940 and 1945 or between 1905 and 1945, or over some intermediate span. It is essential to the process that the analysis include comparisons over a fairly extended period. If the term of comparison is too short, the results are indeterminate. It is, for instance, theoretically impossible to make a determination from a single year by the simulated plant-record method as, by the use of intermediate lives and dispersions, an infinite number of patterns can be found which will yield a calculated balance equal exactly to the actual balance. This condition is probably not much improved by using a span of only four or five years. It appears that theoretically the comparison term should not be less than the age of the first retirements, as would be shown by the actual retirements-frequency-distribution curve of the account. Thus, for a 40-year average life and Iowa Lo dispersion, theoretically one year would suffice; but if the dispersion for that same average life were Iowa S6, a 30-year comparison term would be required. Practically, in dealing with the wider dispersions typical of utility-plant accounts, it is believed that indeterminateness will be avoided if the comparison term is made not less than 20 years.

As to extending the term of comparison beyond that required for determinateness, the choice lies in the statistical philosophy which is to be followed. If one wishes to recognize more fully the influence of earlier experience on the shape of the overall survivorship pattern, it is well to make the term quite extended. In the comparisons made in recent years is included the late history of old plant; but in the comparisons of earlier years, this same plant is included in its younger days. By the more extended comparison term, we give added weight to the experience of earlier years. Thus, in the case of short-lived accounts, is introduced life and dispersion indications of vintages which have no present-day survivors. One reason for doing this, assuming that necessary future redeterminations will be similarly made, would be to avoid the undue fluctuations of life and dispersion estimates which would result if attempt were made to follow the vicissitudes of short-time-life-and-dispersion indications. The point, however, is not as important as it may seem, for the reason that with any plant which has had the growth characteristics exhibited by most of the electric and gas accounts, the additions of recent decades so far outweigh the additions of earlier decades as to make balance comparisons of the recent periods controlling in the findings of the simulated plant-record process as here outlined. In such accounts the result will not be materially changed by making balance comparisons prior to, say, 1915, although it may be desirable to do so if it is thought that the acceptability of the conclusions is thereby improved.

It is, however, not necessary for the observations to be made in each year in the selected comparison term. It appears that, ordinarily, balance comparisons made for every fourth or fifth year will give a result not importantly different than comparisons made on the basis of every year. This reduces the labor of the computations considerably.

Fitting Process

In practice, a computation sheet, such as appears in Figure 5 to illustrate the principle, need not be made. Since we are interested in the simulated balances of only certain years, the selected vertical columns on the illustration can be computed vertically and directly instead of horizontally filling in the whole sheet. Cross multiplications can be accumulated in the calculating machine without the necessity of writing down the individual products. A form such as illustrated in Figure 8 has been found suitable. It has been filled in with the data previously referred to as applying to Figure 6. The survivor-calculation process consists of laying the chosen survivors-table strip alongside of the column of additions which has been entered on the form, matching the bottom on the strip (age 0.5 year) with the year whose survivors are to be first calculated, say in this case 1940, and then cross-multiplying each year's additions by the adjacent percentage on the strip and accumulating the products. Thus is obtained the total of the 1940 survivors contributed by all of the previous years' additions. The result is posted opposite 1940 in the second column of the pair of columns which has been captioned with the average age and mortality dispersion type of the calculation. Using the same survivors-table strip, but shifting it and clipping it so that its bottom (age 0.5 year) is opposite and adjacent to the 1935 additions (assuming the comparison is to be made every five years), the cross-multiplication and product accumulation process is repeated to give the 1935 calculated balance. This result is posted opposite 1935 in the calculated balance column on the form shown in Figure 8. The same procedure is repeated for every fifth year back as far as it is desired to make the computation.

The difference between each calculated balance and the corresponding actual balance is observed and squared. The squared difference, if a form such as in Figure 8 is used, is posted in the column immediately to the left of the calculated balance to which it pertains. The squared differences are then footed and divided by the number of years whose balances have been calculated, to give the mean square of differences. Thus, if observations are made in 1940, 1935, 1930, 1925, and 1920, as in this case, the divisor would be 5. The mean square is, of course, positive, but a plus or minus mark is associated with this figure to indicate whether the sum of the squares of plus differences (over estimates) is respectively more or less than the sum of the squares of minus differences (under estimates). Repeated trials are made with other survivors-table strips to discover the particular average life and mortality dispersion which gives the least mean square of differences.

The results of the successive trials can be conveniently posted on a form such as appears in Figure 9 entitled Mean Square of Differences. This form is designed to guide wisely the selection of, and thereby minimize the number of, successive trial calculations. This effect has been accomplished by arranging the mortality-dispersion-type columns in a suitable order for growing plant, such as is generally experienced in the electric and gas utilities.[6] Ordinarily, trials recorded on this sheet become progressively higher overages as they lie to the right of (decreased dispersion) or below (increased life) the sought-for minimum, and become progressively greater underages as they depart to the left (increased dispersion) and above (decreased life). The finally discovered least square can be circled to indicate that its corresponding average life and dispersion type are selected as representative of the account. The posted figures need be to only three significant places in some convenient power of 10.

Ordinarily, it is wise to make calculations all the way across the sheet by determining the best fitting average life for every type of mortality dispersion. This is advisable because there may be several "nodal" points, i.e., points at which the mean-square-of-differences is lower than for surrounding patterns. In fact, if experience with an account has been meagre, some of these auxiliary low points may be preferred for estimating purposes, for reasons to be explained later. It has been found that few accounts require less than 40 trials and few more than 110. The average runs about 70 trials.

The foregoing calculating procedure and the suggested forms are based on the use of calculating machines. The average elapsed time (not calculating time) required, using skilled operators on key-operated machines for a large project involving, in the main, comparisons at nine points, at intervals of five years, was slightly less than one-half man hour per trial, or about one week's work for one operator per account. Technical supervision of the work should require about one-fourth of the time required for calculating. These time estimates do not include the time required for compilation of additions and balances, preparation of survivors tables, nor the work of organizing the procedures and preparation of forms. The computing time may be shortened by the use of punched-card techniques with an automatic multiplier, but unless punched-card facilities are available on a cost basis which is incremental to some other operation, the cost is not likely to be less. It is conceivable that some of the recent developments in high-speed, large-scale digital computing devices may be very favorable to the simulation method of life analysis.

The work can be speeded considerably by using lumped additions instead of annual additions. That is, the additions of each five-year period may be taken as if made in the middle year of the period or, more accurately, in that year in which the weighted mean time of installation for the five-year period occurs. In this case, years selected for comparison of actual and simulated balances must fall on only the terminal years of the lumped periods. The lumping of additions need not be by uniform periods, but the special care required in handling such an operation is not compatible with production methods. Such rough computations, if handled understandingly, can reduce the time required to discover the area in which the desired fit falls, and can be finished off with the more refined computation using each year's additions in only that area.

Adjustments for Missing Early Additions Records

In connection with the simulated plant-record method, as may be surmised, it is theoretically necessary to have a record of plant additions going back so far that it will include all additions of which there are survivors, according to any trial mortality pattern, in the earliest year which is being used as a year of comparison between calculated and actual balances. Thus, for very short-lived accounts, the record need not go back as far as is necessary for longer-lived accounts. If the actual early additions are not available, it is advisable to make an estimate of them. If they were small in relation to later additions, accuracy of this estimate is not of great importance, as the small early additions have little influence on the selection of the best fitting mortality pattern. If the early additions are large in relation to the more recent additions, the dependability of the results will be affected by the accuracy with which the early additions are estimated.

In reconstructing early history, it is frequently easier to estimate in terms of balances than to estimate additions directly. From these balances, by the further assumption of a reasonable mortality pattern, the corresponding additions can be computed.[7]

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[6] The order here used is that of the areas of the generalized survivor curves between the limits of 10 per cent and 90 per cent of average life.

[7] Some simple mortality pattern or other rough step-by-step development of the additions will probably suffice. If a more rigorous approach is desired, successive values of additions can be calculated from the balances and the selected retirements-frequency distribution by the following formula:

$$A_k = \frac{(B_k - B_{k-1}) + \sum_{n=0}^{n=k-1} A_n f(x=k-t+1)}{1 - f(x-1)}$$

Where A = additions during the chronological year indicated by subscript

B = known balance at the end of the chronological year indicated by subscript

$f(x)$ = selected retirements-frequency distribution, expressed as proportion of a given year's additions retired during each age-year t

t = a sequence of identification numbers representing chronological years, such that $n = 0$ represents the beginning of the record and $n = 1$ represents the year of first additions

k = a particular chronological year, i.e., a particular value of n

If, because the early additions are large in comparison with later additions, this mortality-pattern assumption is deemed to be critical, then theoretically the assumed mortality pattern should, for each particular trial, be that which is to be used for simulation of the later plant record.

Another approach to the estimation of early additions is by the use of the known or estimated age distribution of the plant which survives in the first year of dependable records. By the use of an assumed survivors table the survivors of the various ages can be thrown back to their originating additions values.

It is also possible to disregard the unknown early additions and use for the simulated plant-record procedure only the additions of the years subsequent to the beginning of the dependable record, provided appropriate adjustments of later balances are made. In this case, the subsequent years' survivors of the plant balance at the beginning of the dependable record are computed. Again this requires the assumption of a reasonable survivors pattern. The resulting subsequent years' survivors would be subtracted from the corresponding actual total balances so as to give a series of values comparable with the balances calculated from the known additions; or they could be added to the calculated balances for comparison with the true total balances. This adjustment is, of course, uncalled for if there are no survivors of the first dependable year's balance in the earliest year which is used for comparison of actual and calculated balances.

Even if the early records are dependable as to balances, it is possible that a good record of gross additions may not be available. In such cases the missing data can be reconstructed or adjusted for on an estimated basis by the foregoing methods. A method which obviates any necessity for a separate adjustment in these cases has been proposed by Paul H. Jeynes of Public Service Electric and Gas Co., Newark, N. J. Instead of deriving simulated balances from the summation of cross products of annual additions by the survivors table, or of deriving simulated retirements from the summation of cross products of annual additions by the corresponding retirements table, it uses the summation of the cross products of annual increases in balance (net additions) by a table of annual "replacement" ratios, to get simulated retirements. Tables of annual replacement ratios, which represent the annual replacement required to perpetually maintain an original installation of unity, can be calculated from the retirements-frequency-distribution curve for the several mortality dispersions.[8] If the balances are sound, the use of net additions instead of gross additions eliminates any error arising from absence of good gross additions figures, provided the plant figures are correct in the years which are used for comparison between actual and simulated plant records. The method applies equally well as far as precision is concerned to simulation of balances or of periodic retirements, but is, of course, of no purpose in simulation of accumulated retirements unless the retirements of the unsatisfactory years are excluded from the accumulation. Because simulated periodic retirements are the direct result of this procedure, and simulated balances require further computation, the method is better adapted to the simulation of periodic retirements rather than simulated balances. Except for the elimination of errors, which may be due to inaccurate early gross addition records, the results for homogeneous plant are identical with calculations originating from additions records.

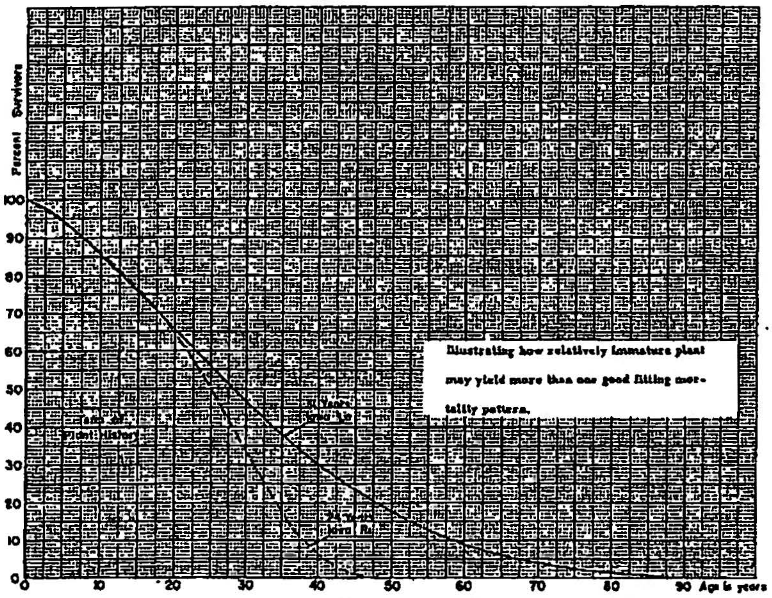

Fig. 10—Multiple Pattern Indications

Multiple Indications

One cannot pursue the plant-record-simulation methods, or for that matter the actuarial methods, in practice without running into indications of more than one good fitting pattern of life and mortality dispersion for some accounts. This arises in the case of plant which is immature in relation to the indications of the best fitting patterns. Thus, it may be found for plant, the bulk of whose additions have occurred in the last 20 years, that the actual year-by-year balances are simulated equally well by calculated balances resulting from average life of 24 years and dispersion type R1, as by the balances calculated from average life of 31 years and dispersion type Lo. The reason for this can be seen by plotting the two patterns in terms of survivors percentages on the same coordinates. The two curves are substantially the same in the range of the 20-year plant history, as will be seen in Figure 10. The method reads the

[8] Such tables for the Iowa dispersion types and for an average life of ten years appear in Bulletin 125 of Iowa Engineering Experiment Station, "Retirement Characteristics of Industrial Property Groups," by Professor Robley Winfrey, 1935.

index is, however, not too important. If it is bad, there is usually not much that can be done about it, except to be forewarned in using the results. Re-examination of the account in the future may divulge a more definite characteristic. But good or bad, nothing better may be available, and therefore it might be quite reasonable to use the figure resulting from the simulated plant-record analysis, even though the conformance index is not good.

If the retirements-experience index is "Poor," or "Valueless," even though the conformance index be high, the result should not be accepted. There simply has not been enough experience with the account for it to exhibit a conclusive life characteristic. In all such cases, for estimating purposes, the result of the analysis should be discarded and a judgment figure should be substituted in place of it. In those cases where the experience index is only fair, the result should be examined critically, and if it is not supported by reasoned judgment, it should be accordingly modified.

Whenever judgment does not permit acceptance of the best fitting pattern as an estimate of the future, it may be desirable that the second, or even the third best fit be selected as typical of the account if one of these falls close to the life and dispersion which is dictated by judgment. The selected pattern will thereby maintain some consistency with the actual, although limited, experience. If none of those subordinate fits is acceptable and judgment dictates some other average life, it may still be desirable to associate with that life, if past experience with the account is deemed to have any value at all, a dispersion type which is consistent with that past experience. This would be done by selecting that mortality dispersion which showed the least mean square of differences between actual and calculated balances for the average life determined by judgment. Inspection of the already calculated mean squares on the form in Figure 9 will probably show this pattern without the necessity of further calculation.

Summary

In summary, the simulated plant-record method of analyzing utility-plant history constitutes at this writing the only method, other than the frequently unavailable actuarial procedure, by which the necessary element of mortality dispersion as well as average life can be determined for group-depreciation-accounting purposes. This exposition of the method elaborates on the indicated survivors method as hitherto reported by:

1. Emphasis of the necessity for comparing balances calculated from assumed patterns of average life and mortality dispersion with the actual balances over an extended term of years.
2. Application of the least squares method of discovering the best fitting pattern of life and mortality dispersion, rather than the rougher and less objective graphical comparison.
3. Reference to Whiton's application of the principle to retirements comparisons.
4. Suggestion of forms and procedures which facilitate the calculations.
5. Determination of the relative stability of the past average-life and dispersion characteristics by means of the conformance index.
6. Indication of results which are of diminished value because of plant immaturity by use of the retirements-experience index.

In any application of this method it goes without saying that the first requirement is a good record of the year-by-year additions and balances classified according to the present system of accounts. Carefully planned production methods are essential. The use of conveniently set up survivors-tables strips, instead of writing and rewriting the figures, and the use of a convenient computation form, are steps to that end. The adoption of the mean-square-of-differences tally sheet, which economically guides the succession of trial and error calculations of "simulated balances" until the least mean square and thus the best fitting pattern of average life and mortality dispersion is found, is an important feature of the procedure. Time and economy considerations will recommend the use of skilled calculators with key-operated machines or automatic multiplication from punched cards.

Basically, operating on corresponding data and fitting the same family of generalized mortality dispersions, the results of the simulation method will be the same as those of the actuarial method. Where a fairly stable life and dispersion characteristic has been experienced, the plant-record-simulation method will discover it. Where the life and dispersion have been moderately fluctuating, the method will give a desirably weighted average indication. In either case, the result should be helpful in selecting a suitable average life and dispersion for the determination of accrual rate and theoretical reserve requirement for future depreciation accounting associated with life. If the life and mortality dispersion characteristics have fluctuated wildly, or if the plant is immature in relation to the best fitting pattern, neither this method nor any other statistical procedure will give an answer of any prophetic merit. The method is entirely independent of irregularities in the amount or rate of growth, and functions equally well on declining plant balances as on increasing balances. Only if the plant is perfectly static does the method become indeterminate as to dispersion type, although not as to the average life indication.

APPENDIX – C

Public Service Co of New Hampshire

Remaining Life Depreciation Accrual Summary

As of: January 1, 2003

Acct	Acct Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
311	STRUCTURES & IMPROVEMENTS	56,807,242	Forecast	24.2	0.00%	0	38,202,602	44,092,692	12,714,550	8.99	1,600,486	2.82%
312	BOILER PLANT EQUIPMENT	254,316,861	Forecast	19.9	0.00%	0	152,183,628	157,947,782	96,369,079	9.09	12,733,018	5.01%
314	TURBOGENERATOR UNITS	85,296,520	Forecast	23.3	0.00%	0	58,212,372	59,800,411	25,496,109	9.04	3,344,980	3.92%
315	ACCESSORY ELECTRIC EQUIPMENT	11,504,508	Forecast	28.3	0.00%	0	8,234,291	9,038,365	2,466,143	8.24	349,058	3.03%
316	MISCELLANEOUS POWER PLANT EQUIPMENT	11,775,811	Forecast	17.6	0.00%	0	5,911,385	6,107,796	5,668,015	10.57	670,057	5.69%
	TOTAL STEAM PRODUTION	419,700,942		21.1	0.00%	0	262,744,278	276,987,047	142,713,895	9.12	18,697,597	4.45%
331	STRUCTURES & IMPROVEMENTS	10,209,025	S0	58.0	0.00%	0	2,832,812	4,040,437	6,168,588	42.8	144,558	1.42%
332	RESERVOIRS, DAMS, WATERWAYS	16,282,676	R0.5	73.0	0.00%	0	4,748,885	7,913,796	8,368,880	54.5	155,879	0.96%
333	WATERWHELLS, TURBINES, GENERATORS	8,889,978	S0	61.0	0.00%	0	2,599,609	3,653,187	5,236,791	46.3	114,431	1.29%
334	ACCESSORY ELECTRIC EQUIPMENT	3,457,820	S0	30.0	0.00%	0	1,175,284	1,700,281	1,757,539	20.8	85,365	2.47%
335	MISCELLANEOUS POWER PLANT EQUIPMENT	800,331	S6	39.0	0.00%	0	357,440	467,252	333,079	25.9	12,960	1.62%
336	ROADS, RAILROADS, BRIDGES	171,164	SQ	50.0	0.00%	0	93,505	116,477	54,687	32.3	1,970	1.15%
	TOTAL HYDRO PRODUCTION	39,810,994		58.2	0.00%	0	11,807,535	17,891,430	21,919,564	46.0	515,162	1.29%
341	STRUCTURES & IMPROVEMENTS	390,404	Forecast	30.0	0.00%	0	331,875	375,029	15,375	4.50	3,417	0.88%
342	FUEL HOLDERS, PRODUCERS, ACCESSORIES	615,841	Forecast	20.9	0.00%	0	483,523	590,135	25,706	4.50	5,712	0.93%
343	PRIME MOVERS	3,187,630	Forecast	30.9	0.00%	0	2,723,029	3,102,664	84,966	4.50	18,881	0.59%
344	GENERATORS	4,459,522	Forecast	37.7	0.00%	0	3,927,128	4,459,522	0	4.50	0	0.00%
345	ACCESSORY ELECTRIC EQUIPMENT	133,895	Forecast	20.0	0.00%	0	103,818	117,535	16,360	4.50	3,636	2.72%
346	MISCELLANEOUS POWER PLANT EQUIPMENT	49,817	Forecast	13.4	0.00%	0	33,055	35,528	14,289	4.50	3,175	6.37%
	TOTAL OTHER PRODUCTION	8,837,109		32.2	0.00%	0	7,602,429	8,680,411	156,697	4.50	34,822	0.39%
	TOTAL PRODUCTION PLANT	468,349,045		22.5	0	0	282,154,242	303,558,888	164,790,157	14.03	19,247,581	4.11%
350	EASEMENTS	10,608,639	SQ	65.0	0.00%	0	0	0	10,608,639	65.00	163,210	1.54%

Public Service Co of New Hampshire

Remaining Life Depreciation Accrual Summary
As of: January 1, 2003

Acct	Acct Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
352	STRUCTURES & IMPROVEMENTS	2,033,232	Various	50.0	0.00%	0	965,551	1,169,033	864,199	26.26	32,915	1.62%
353	STATION EQUIPMENT	36,911,240	Various	62.2	-20.00%	(7,382,248)	16,241,763	19,508,466	24,785,021	34.83	711,552	1.93%
354	TOWERS & FIXTURES	11,346,311	Various	61.0	-25.00%	(2,836,578)	6,703,524	9,345,211	4,837,678	24.97	194,197	1.71%
355	POLES & FIXTURES	32,929,466	Various	67.2	-40.00%	(13,171,786)	17,981,857	22,363,603	23,737,650	30.51	778,200	2.36%
356	OVERHEAD CONDUCTORS & DEVICES	32,119,322	Various	61.2	-20.00%	(6,423,864)	18,142,806	22,556,918	15,986,268	26.64	602,518	1.88%
357	UNDERGROUND CONDUIT	421	Various	83.8	-10.00%	(42)	339	406	57	16.39	3	0.83%
358	UNDRGRND CONDUCTORS & DEVICES	(0)	Various	54.6	-5.00%	0	(0)	(0)	(0)	16.11	(0)	1.06%
359	ROADS & TRAILS	693,507	Various	65.1	0.00%	0	244,791	312,204	381,303	42.15	9,059	1.31%
	TOTAL TRANSMISSION PLANT	126,642,138		56.3	-23.54%	(29,814,519)	60,280,631	75,255,842	81,200,815	35.25	2,491,655	1.97%
360	EASEMENTS	603,300	SQ	65.0	0.00%	0	0	0	603,300	65.00	9,282	1.54%
361	STRUCTURES & IMPROVEMENTS	5,938,344	Various	50.5	0.00%	0	2,895,203	3,605,731	2,332,613	25.86	90,373	1.52%
362	STATION EQUIPMENT	59,958,963	Various	59.5	-17.13%	(10,270,739)	25,888,008	30,528,028	39,701,675	33.84	1,176,065	1.96%
364	POLES, TOWERS, & FIXTURES	134,851,732	Various	32.5	-17.10%	(23,052,968)	66,126,467	76,741,031	81,163,668	16.58	5,120,963	3.80%
365	OVERHEAD CONDUCTORS & DEVICES	210,368,275	Various	39.1	-19.98%	(42,022,136)	63,445,777	58,816,659	193,573,752	27.32	7,086,988	3.37%
366	UNDERGROUND CONDUIT	9,338,314	Various	75.2	-14.86%	(1,387,448)	2,517,250	2,801,824	7,923,938	54.90	146,650	1.57%
367	UNDERGROUND CONDUCTORS & DEVICES	48,504,511	Various	43.0	-14.84%	(7,196,556)	14,887,039	15,375,281	40,325,786	29.77	1,367,726	2.82%
368	LINE TRANSFORMERS	138,077,302	Various	40.0	0.00%	0	40,745,153	55,170,392	82,906,910	28.20	2,940,334	2.13%
369	SERVICES	44,801,579	Various	40.6	-45.00%	(20,160,711)	18,742,483	21,878,398	43,083,892	23.64	1,832,336	4.09%
370	METERS	49,124,861	Various	35.6	0.00%	0	21,753,563	19,408,744	29,716,117	19.84	1,497,945	3.05%
371	INSTALLATIONS ON CUSTOMERS' PREMISES	7,703,465	Various	21.0	-15.00%	(1,155,520)	4,605,459	3,662,770	5,196,214	8.45	615,056	7.98%
373	STREET LGHTING & SIGNAL SYSTEMS	4,437,609	Various	26.8	-15.00%	(665,641)	2,767,964	2,100,572	3,002,678	10.09	297,671	6.71%
	TOTAL DISTRIBUTION PLANT	713,708,255		35.3	-14.84%	(105,911,719)	264,374,366	290,089,432	529,530,542	25.93	22,181,389	3.11%

Public Service Co of New Hampshire

Remaining Life Depreciation Accrual Summary
As of: January 1, 2003

Acct	Acct Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
303	INTANGIBLE PLANT	10,329,075	SQ	5.00	0.00%	0	5,483,103	2,838,428	7,490,647	4.64	1,615,539	15.64%
	TOTAL INTANGIBLE PLANT	10,329,075		5.0	0.00%	0	5,483,103	2,838,428	7,490,647	4.64	1,615,539	15.64%
390	STRUCTURES & IMPROVEMENTS	43,794,591	R1.5	40.0	0.00%	0	3,569,299	6,153,030	37,641,561	36.81	1,022,683	2.34%
391	OFFICE FURNITURE & EQUIPMENT	14,959,879	Various	7.9	1.20%	178,818	10,764,944	9,512,594	5,268,467	3.21	1,638,996	10.96%
393	STORES EQUIPMENT	550,107	SQ	25.0	0.00%	0	340,930	345,385	204,722	11.95	17,137	3.12%
394	TOOLS, SHOP AND GARAGE EQUIPMENT	4,495,441	SQ	24.0	10.00%	449,544	2,260,274	2,906,416	1,139,481	13.73	83,014	1.85%
395	LABORATORY EQUIPMENT	2,869,730	SQ	28.0	0.00%	0	1,478,057	1,677,409	1,192,321	15.48	77,026	2.68%
398	MISCELLANEOUS EQUIPMENT	650,386	SQ	20.0	0.00%	0	350,220	524,595	125,791	11.84	10,626	1.63%
	TOTAL T&D EQUIP	8,565,664		24.9	5.25%	449,544	4,429,481	5,453,805	2,662,314	14.29	187,803	2.19%
397	COMMUNICATIONS EQUIPMENT	22,499,863	L4	18.0	0.00%	0	11,006,404	13,479,858	9,020,005	9.39	973,644	4.33%
392	TRANSPORTATION EQUIPMENT	7,111,433	Various	11.8	10.00%	711,143	6,061,944	6,728,058	(327,768)	0.93	22,053	0.31%
396	POWER OPERATED EQUIPMENT	214,062	SQ	10.0	0.00%	0	214,062	197,779	16,283	1.00	16,283	7.61%
	TOTAL TRANSPORTAITION EQUIP	7,325,495		11.8	9.71%	711,143	6,276,006	6,925,837	(311,485)	0.93	38,336	0.52%
	TOTAL GENERAL PLANT	97,145,492		18.7	1.38%	1,339,505	36,046,134	41,525,124	54,280,863	28.53	3,861,463	3.97%
	TOTAL COMPANY	1,416,174,004		28.0	-9.49%	(134,386,733)	648,338,476	713,267,713	837,293,024	24.47	49,397,627	3.49%

Acct	Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	STEAM PROUCTION PLANT											
	MERRIMACK											
311	STRUCTURES & IMPROVEMENTS											
	COMMON	6,751,441	2008	21.5	0.00%	0	5,021,729	4,864,623	1,886,818	5.50	343,058	5.08%
	UNIT 1	3,900,375	2007	40.6	0.00%	0	3,468,171	3,359,669	540,707	4.50	120,157	3.08%
	UNIT 2	5,626,413	2008	32.9	0.00%	0	4,685,061	4,538,488	1,087,925	5.50	197,805	3.52%
	TOTAL ACCOUNT 311	16,278,229		28.0	0.00%	0	13,174,962	12,762,780	3,515,449	5.35	661,019	4.06%
312	BOILER PLANT EQUIPMENT											
	COMMON	11,062,778	2008	25.8	0.00%	0	8,706,037	7,788,258	3,274,520	5.50	595,367	5.38%
	UNIT 1	27,355,911	2007	15.1	0.00%	0	19,213,204	17,187,774	10,168,137	4.50	2,259,586	8.26%
	UNIT 2	72,726,086	2008	16.0	0.00%	0	47,705,517	42,676,466	30,049,620	5.50	5,463,567	7.51%
	TOTAL ACCOUNT 312	111,144,775		16.4	0.00%	0	75,624,758	67,652,499	43,492,276	5.27	8,318,520	7.48%
314	TURBOGENERATOR UNITS											
	COMMON	295,916	2008	18.1	0.00%	0	206,224	201,323	94,593	5.50	17,199	5.81%
	UNIT 1	9,775,529	2007	23.2	0.00%	0	7,875,484	7,688,323	2,087,206	4.50	463,824	4.74%
	UNIT 2	25,107,113	2008	19.6	0.00%	0	18,054,156	17,625,099	7,482,014	5.50	1,360,366	5.42%
	TOTAL ACCOUNT 314	35,178,558		20.4	0.00%	0	26,135,864	25,514,745	9,663,813	5.28	1,841,388	5.23%
315	ACCESSORY ELECTRIC EQUIPMENT											
	COMMON	896,530	2008	12.0	0.00%	0	486,282	455,086	441,444	5.50	80,262	8.95%
	UNIT 1	1,321,943	2007	25.2	0.00%	0	1,086,321	1,016,631	305,312	4.50	67,847	5.13%
	UNIT 2	1,930,988	2008	23.8	0.00%	0	1,484,305	1,389,083	541,905	5.50	98,528	5.10%
	TOTAL ACCOUNT 315	4,149,461		19.9	0.00%	0	3,056,908	2,860,800	1,288,661	5.26	246,638	5.94%
316	MISCELLANEOUS POWER PLANT EQUIPMENT											
	COMMON	4,691,829	2008	13.8	0.00%	0	2,816,751	2,715,164	1,976,665	5.50	359,394	7.66%
	UNIT 1	242,300	2007	14.3	0.00%	0	166,152	160,159	82,141	4.50	18,254	7.53%
	UNIT 2	205,321	2008	23.4	0.00%	0	157,031	151,367	53,954	5.50	9,810	4.78%
	TOTAL ACCOUNT 316	5,139,450		14.0	0.00%	0	3,139,933	3,026,690	2,112,760	5.46	387,457	7.54%
	TOTAL MERRIMACK	171,890,473		17.8	0.00%	0	121,132,425	111,817,514	60,072,959	5.28	11,455,023	6.66%
	NEWINGTON											
311	STRUCTURES & IMPROVEMENTS	18,729,192	2014	33.3	0.00%	0	12,257,539	12,798,099	5,931,093	11.50	515,747	2.75%
312	BOILER PLANT EQUIPMENT	77,273,737	2014	20.9	0.00%	0	34,777,783	32,041,496	45,232,241	11.50	3,933,238	5.09%
314	TURBOGENERATOR UNITS	29,528,095	2014	25.8	0.00%	0	16,362,609	16,058,885	13,469,210	11.50	1,171,236	3.97%
315	ACCESSORY ELECTRIC EQUIPMENT	5,018,461	2014	35.0	0.00%	0	3,370,918	3,841,957	1,176,504	11.50	102,305	2.04%
316	MISCELLANEOUS POWER PLANT EQUIPMENT	3,309,734	2014	21.6	0.00%	0	1,548,893	1,366,945	1,942,789	11.50	168,938	5.10%
	TOTAL NEWINGTON	133,859,219		23.5	0.00%	0	68,317,741	66,107,382	67,751,837	11.50	5,891,464	4.40%

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Acct	Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	SCHILLER											
311	STRUCTURES & IMPROVEMENTS											
	COMMON	17,819,175	2020	18.0	0.00%	0	10,378,802	15,344,832	2,474,343	7.50	330,044	1.85%
	UNIT 4	1,025,030	2008	14.8	0.00%	0	644,828	953,364	71,666	5.50	13,030	1.27%
	UNIT 5	1,245,791	2020	35.3	0.00%	0	628,399	929,074	316,717	17.50	18,098	1.45%
	UNIT 6	650,741	2007	9.5	0.00%	0	343,989	508,580	142,161	4.50	31,591	4.85%
	TOTAL ACCOUNT 311	20,740,737		17.8	0.00%	0	11,996,019	17,735,851	3,004,886	8.36	392,764	1.89%
312	BOILER PLANT EQUIPMENT											
	COMMON	20,730,220	2020	33.5	0.00%	0	9,915,327	15,272,656	5,457,564	17.50	311,861	1.50%
	UNIT 4	13,578,383	2008	24.0	0.00%	0	10,469,603	13,578,383	(0)	5.50	(0)	0.00%
	UNIT 5	13,308,024	2020	36.5	0.00%	0	6,931,101	11,855,308	1,452,716	17.50	83,012	0.62%
	UNIT 6	14,972,038	2007	22.9	0.00%	0	12,023,973	14,972,038	(0)	4.50	(0)	0.00%
	TOTAL ACCOUNT 312	62,588,665		28.4	0.00%	0	39,340,005	55,678,385	6,910,280	17.50	394,873	0.63%
314	TURBOGENERATOR UNITS											
	COMMON	257,498	2020	30.5	0.00%	0	109,962	160,078	97,420	17.50	5,567	2.16%
	UNIT 4	3,080,981	2008	41.0	0.00%	0	2,667,759	3,080,981	0	5.50	0	0.00%
	UNIT 5	3,374,429	2020	48.0	0.00%	0	2,143,738	2,501,325	873,104	17.50	49,892	1.48%
	UNIT 6	12,368,045	2007	20.7	0.00%	0	9,673,294	11,286,850	1,081,195	4.50	240,266	1.94%
	TOTAL ACCOUNT 314	19,080,953		25.3	0.00%	0	14,594,752	17,029,234	2,051,719	10.65	295,724	1.55%
315	ACCESSORY ELECTRIC EQUIPMENT											
	COMMON	333,098	2020	33.8	0.00%	0	160,403	333,098	0	17.50	0	0.00%
	UNIT 4	883,686	2008	43.4	0.00%	0	771,588	883,686	0	5.50	0	0.00%
	UNIT 5	522,773	2020	53.8	0.00%	0	352,803	522,773	0	17.50	0	0.00%
	UNIT 6	529,026	2007	36.9	0.00%	0	464,514	529,026	0	4.50	0	0.00%
	TOTAL ACCOUNT 315	2,268,583		41.8	0.00%	0	1,749,307	2,268,583	0	0.00	0	0.00%
316	MISCELLANEOUS POWER PLANT EQUIPMENT											
	COMMON	2,627,644	2020	27.1	0.00%	0	929,929	1,382,874	1,244,770	17.50	71,130	2.71%
	UNIT 4	126,975	2008	14.4	0.00%	0	78,372	116,545	10,430	5.50	1,896	1.49%
	UNIT 5	210,068	2020	20.6	0.00%	0	31,290	46,531	163,537	17.50	9,345	4.45%
	UNIT 6	238,407	2007	8.1	0.00%	0	105,668	157,136	81,271	4.50	18,060	7.58%
	TOTAL ACCOUNT 316	3,203,094		22.0	0.00%	0	1,145,258	1,703,086	1,500,008	16.71	100,431	3.14%
	TOTAL SCHILLER	107,882,032		25.0	0.00%	0	68,825,342	94,415,139	13,466,893	14.33	1,183,792	1.10%
	WYMAN											
311	STRUCTURES & IMPROVEMENTS	1,059,084	2011	31.6	0.00%	0	774,082	795,962	263,122	8.50	30,956	2.92%
312	BOILER PLANT EQUIPMENT	3,309,684	2011	32.4	0.00%	0	2,441,082	2,575,403	734,281	8.50	86,386	2.61%
314	TURBOGENERATOR UNITS	1,508,914	2011	32.9	0.00%	0	1,119,147	1,197,547	311,367	8.50	36,631	2.43%
315	ACCESSORY ELECTRIC EQUIPMENT	68,003	2011	53.3	0.00%	0	57,159	67,025	978	8.50	115	0.17%
316	MISCELLANEOUS POWER PLANT EQUIPMENT	123,533	2011	22.7	0.00%	0	77,301	11,075	112,458	8.50	13,230	10.71%
	TOTAL WYMAN	6,069,218		32.2	0.00%	0	4,468,770	4,647,012	1,422,206	8.50	167,318	2.76%
	TOTAL STEAM PRODUCTION	419,700,942		21.1	0.00%	0	262,744,278	276,987,047	142,713,895	9.12	18,697,597	4.45%

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Account:	Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	HYDRAULIC PRODUCTION PLANT											
	AMOSKEAG - LP 1893											
331	STRUCTURES & IMPROVEMENTS											
	PROJECT	2,025,414	S0	58.0	0.00%	0	462,993	639,985	1,385,429	44.7	30,965	1.53%
	NON-PROJECT	0	S0	58.0	0.00%	0	0	0	0	1.0	0	0.00%
	TOTAL ACCOUNT 331	2,025,414		58.0	0.00%	0	462,993	639,985	1,385,429	44.74	30,965	1.53%
332	RESERVOIRS, DAMS, WATERWAYS											
	PROJECT	4,561,390	R0.5	73.0	0.00%	0	998,686	1,525,715	3,035,675	57.0	53,241	1.17%
	NON-PROJECT	10,826	R0.5	73.0	0.00%	0	5,485	8,380	2,446	36.0	68	0.63%
	TOTAL ACCOUNT 332	4,572,216		73.0	0.00%	0	1,004,171	1,534,095	3,038,121	57.00	53,309	1.17%
333	WATERWHELLS, TURBINES, GENERATORS											
	PROJECT	400,897	S0	61.0	0.00%	0	241,942	349,204	51,693	24.2	2,137	0.53%
334	ACCESSORY ELECTRIC EQUIPMENT											
	PROJECT	496,899	S0	30.0	0.00%	0	212,109	299,039	197,860	19.6	10,087	2.03%
	NON-PROJECT	48,749	S0	30.0	0.00%	0	23,914	33,715	15,034	15.3	984	2.02%
	TOTAL ACCOUNT 334	545,648		30.0	0.00%	0	236,023	332,754	212,894	19.3	11,071	2.03%
335	MISCELLANEOUS POWER PLANT EQUIPMENT											
	PROJECT	196,748	S6	39.0	0.00%	0	82,890	100,692	96,056	24.6	3,912	1.99%
	NON-PROJECT	2,580	S6	39.0	0.00%	0	1,026	1,246	1,334	23.4	57	2.21%
	TOTAL ACCOUNT 335	199,328		39.0	0.00%	0	83,916	101,938	97,390	24.5	3,969	1.99%
336	ROADS, RAILROADS, BRIDGES											
	PROJECT	77,585	SQ	50.0	0.00%	0	22,756	34,281	43,304	35.3	1,226	1.58%
	TOTAL AMOSKEAG	7,821,088		60.6	0.00%	0	2,051,801	2,992,257	4,828,831	50.6	102,677	1.31%

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	AYERS ISLAND - LP 2456											
331	STRUCTURES & IMPROVEMENTS	490,459	S0	58.0	0.00%	0	187,936	289,555	200,904	35.8	5,616	1.15%
332	RESERVOIRS, DAMS, WATERWAYS	2,149,374	R0.5	73.0	0.00%	0	878,737	1,343,417	805,957	43.2	18,676	0.87%
333	WATERWHELLS, TURBINES, GENERATORS	401,798	S0	61.0	0.00%	0	147,953	226,476	175,322	38.5	4,549	1.13%
334	ACCESSORY ELECTRIC EQUIPMENT	397,039	S0	30.0	0.00%	0	145,770	185,946	211,093	19.2	11,016	2.77%
335	MISCELLANEOUS POWER PLANT EQUIPMENT	53,959	S6	39.0	0.00%	0	19,742	32,254	21,705	24.8	875	1.62%
336	ROADS, RAILROADS, BRIDGES	23,838	SQ	50.0	0.00%	0	20,465	21,123	2,715	7.1	384	1.61%
	TOTAL AYERS ISLAND	3,516,467		59.0	0.00%	0	1,400,603	2,098,771	1,417,696	37.6	41,116	1.17%
	CANAAN - LP 7528											
331	STRUCTURES & IMPROVEMENTS											
	PROJECT	30,067	S0	58.0	0.00%	0	21,629	30,067	0	16.3	0	0.00%
	NON-PROJECT	2,869	S0	58.0	0.00%	0	641	2,869	0	44.7	0	0.00%
	TOTAL ACCOUNT 331	32,936		58.0	0.00%	0	22,270	32,936	0	0.0	0	0.00%
332	RESERVOIRS, DAMS, WATERWAYS											
	PROJECT	505,515	R0.5	73.0	0.00%	0	185,482	446,081	59,434	46.2	1,286	0.25%
	NON-PROJECT	241,429	R0.5	73.0	0.00%	0	39,244	94,380	147,049	61.1	2,405	1.00%
	TOTAL ACCOUNT 332	746,944		73.0	0.00%	0	224,726	540,461	206,483	56.8	3,691	0.49%
333	WATERWHELLS, TURBINES, GENERATORS											
	PROJECT	46,088	S0	61.0	0.00%	0	32,480	46,088	(0)	1.0	(0)	0.00%
334	ACCESSORY ELECTRIC EQUIPMENT											
	PROJECT	100,461	S0	30.0	0.00%	0	22,563	31,240	69,221	28.0	2,473	2.46%
	NON-PROJECT	26,837	S0	30.0	0.00%	0	5,730	7,934	18,903	23.6	801	2.98%
	TOTAL ACCOUNT 334	127,298		30.0	0.00%	0	28,293	39,174	88,124	27.0	3,274	2.57%
335	MISCELLANEOUS POWER PLANT EQUIPMENT											
	PROJECT	2,970	S6	39.0	0.00%	0	1,559	2,639	331	30.1	11	0.37%
	NON-PROJECT	16,482	S6	39.0	0.00%	0	6,973	11,806	4,676	22.5	208	1.26%
	TOTAL ACCOUNT 334	19,452		39.0	0.00%	0	8,532	14,445	5,007	23.0	219	1.13%
	TOTAL CANAAN	972,718		59.7	0.00%	0	316,301	673,104	299,614	47.5	7,184	0.74%

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	EASTMAN FALLS - LP2457											
331	STRUCTURES & IMPROVEMENTS	2,688,044	S0	58.0	0.00%	0	663,772	840,750	1,847,294	43.7	42,294	1.57%
332	RESERVOIRS, DAMS, WATERWAYS	1,697,606	R0.5	73.0	0.00%	0	354,017	371,994	1,325,612	57.8	22,944	1.35%
333	WATERWHELLS, TURBINES, GENERATORS	2,954,029	S0	61.0	0.00%	0	639,341	696,596	2,257,433	47.8	47,229	1.60%
334	ACCESSORY ELECTRIC EQUIPMENT	862,220	S0	30.0	0.00%	0	252,341	355,884	506,336	21.4	23,714	2.75%
335	MISCELLANEOUS POWER PLANT EQUIPMENT	77,919	S6	39.0	0.00%	0	39,798	47,466	30,453	20.9	1,458	1.87%
336	ROADS, RAILROADS, BRIDGES	4,086	SQ	50.0	0.00%	0	1,430	1,889	2,197	32.3	68	1.66%
	TOTAL EASTMAN FALLS	8,283,904		55.7	0.00%	0	1,950,699	2,314,579	5,969,325	46.4	137,707	1.66%
	GARVINS FALLS - LP 1893											
331	STRUCTURES & IMPROVEMENTS	3,551,216	S0	58.0	0.00%	0	922,555	1,344,094	2,207,122	42.9	51,409	1.45%
332	RESERVOIRS, DAMS, WATERWAYS	1,598,014	R0.5	73.0	0.00%	0	283,885	438,990	1,159,024	60.0	19,307	1.21%
333	WATERWHELLS, TURBINES, GENERATORS	4,017,809	S0	61.0	0.00%	0	953,017	1,374,960	2,642,849	46.5	56,820	1.41%
334	ACCESSORY ELECTRIC EQUIPMENT	823,171	S0	30.0	0.00%	0	249,612	391,302	431,869	20.9	20,657	2.51%
335	MISCELLANEOUS POWER PLANT EQUIPMENT	220,974	S6	39.0	0.00%	0	70,677	86,492	134,482	27.7	4,847	2.19%
336	ROADS, RAILROADS, BRIDGES	7,029	SQ	50.0	0.00%	0	3,304	4,753	2,276	26.5	86	1.22%
	TOTAL GARVINS FALLS	10,218,213		56.1	0.00%	0	2,483,050	3,640,591	6,577,622	45.6	153,126	1.50%
	GORHAM - LP 2288											
331	STRUCTURES & IMPROVEMENTS	165,017	S0	58.0	0.00%	0	109,997	157,515	7,502	19.3	388	0.24%
332	RESERVOIRS, DAMS, WATERWAYS	979,172	R0.5	73.0	0.00%	0	294,673	540,958	438,214	51.0	8,587	0.88%
333	WATERWHELLS, TURBINES, GENERATORS	151,937	S0	61.0	0.00%	0	86,648	143,363	8,574	26.2	327	0.22%
334	ACCESSORY ELECTRIC EQUIPMENT											
	PROJECT	231,771	S0	30.0	0.00%	0	95,699	155,349	76,422	17.6	4,339	1.87%
	NON-PROJECT	12,015	S0	30.0	0.00%	0	8,649	12,015	0	8.5	0	0.00%
	TOTAL ACCOUNT 334	243,786		30.0	0.00%	0	104,348	167,364	76,422	17.6	4,339	1.78%
335	MISCELLANEOUS POWER PLANT EQUIPMENT											
	PROJECT	4,821	S6	39.0	0.00%	0	2,159	3,007	1,814	27.5	66	1.37%
	TOTAL GORHAM	1,544,733		57.2	0.00%	0	597,825	1,012,207	532,526	45.3	13,707	0.89%

Data Request OCA Set 2
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Public Service Co of New Hampshire
Remaining Life Depreciation Accrual Summary
As of: January 1, 2003

Account:	Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	HOOKSETT - LP 1893											
331	STRUCTURES & IMPROVEMENTS	102,881	S0	58.0	0.00%	0	35,760	58,570	44,311	37.8	1,171	1.14%
332	RESERVOIRS, DAMS, WATERWAYS	528,545	R0.5	73.0	0.00%	0	190,444	305,894	222,651	46.7	4,768	0.90%
333	WATERWHELLS, TURBINES, GENERATORS	100,365	S0	61.0	0.00%	0	69,255	97,225	3,140	18.9	166	0.17%
334	ACCESSORY ELECTRIC EQUIPMENT	119,699	S0	30.0	0.00%	0	35,473	45,535	74,164	21.3	3,483	2.91%
335	MISCELLANEOUS POWER PLANT EQUIPMENT	106,197	S6	39.0	0.00%	0	34,360	63,969	42,228	27.7	1,526	1.44%
	TOTAL HOOKSETT	957,687		55.1	0.00%	0	365,292	571,193	386,494	38.5	11,114	1.16%
	JACKMAN STATION											
331	STRUCTURES & IMPROVEMENTS											
	LIMITED LIFE	60,499	S0	58.0	0.00%	0	40,349	60,499	0	19.3	0	0.00%
	UNIT 1	33,257	S0	58.0	0.00%	0	8,353	17,191	16,066	43.4	370	1.11%
	TOTAL ACCOUNT 331	93,756		58.0	0.00%	0	48,702	77,690	16,066	43.4	370	0.39%
332	RESERVOIRS, DAMS, WATERWAYS											
	LIMITED LIFE	860,209	R0.5	73.0	0.00%	0	425,331	860,209	0	36.9	0	0.00%
	UNIT 1	832,024	R0.5	73.0	0.00%	0	152,397	444,287	387,737	59.6	6,503	0.78%
	TOTAL ACCOUNT 332	1,692,233		73.0	0.00%	0	577,728	1,304,496	387,737	59.6	6,503	0.38%
333	WATERWHELLS, TURBINES, GENERATORS											
	LIMITED LIFE	85,959	S0	61.0	0.00%	0	53,431	85,959	0	23.1	0	0.00%
	UNIT 1	84,506	S0	61.0	0.00%	0	20,004	60,534	23,972	46.6	515	0.61%
	TOTAL ACCOUNT 333	170,465		61.0	0.00%	0	73,435	146,493	23,972	46.6	515	0.30%
334	ACCESSORY ELECTRIC EQUIPMENT											
	LIMITED LIFE	46,683	S0	30.0	0.00%	0	29,843	43,627	3,056	10.9	281	0.60%
	UNIT 1	3,318	S0	30.0	0.00%	0	817	1,194	2,124	22.6	94	2.83%
	TOTAL ACCOUNT 334	50,001		30.0	0.00%	0	30,660	44,821	5,180	15.7	375	0.75%
335	MISCELLANEOUS POWER PLANT EQUIPMENT											
	LIMITED LIFE	1,289	S6	39.0	0.00%	0	1,289	1,289	0	1.0	0	0.00%
	UNIT 1	0	S6	39.0	0.00%	0	0	0	0	1.0	0	0.00%
	TOTAL ACCOUNT 335	1,289		39.0	0.00%	0	1,289	1,289	0	0.0	0	0.00%
336	ROADS, RAILROADS, BRIDGES											
	LIMITED LIFE	17,856	SQ	50.0	0.00%	0	10,595	13,662	4,194	20.4	206	1.15%
	TOTAL JACKMAN	2,025,600		68.3	0.00%	0	742,409	1,588,451	437,149	57.4	7,969	0.39%

Public Service Co of New Hampshire
Remaining Life Depreciation Accrual Summary
As of: January 1, 2003

Account:	Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	SMITH - LP2287											
331	STRUCTURES & IMPROVEMENTS	1,059,302	S0	58.0	0.00%	0	378,827	599,342	459,960	37.3	12,345	1.17%
332	RESERVOIRS, DAMS, WATERWAYS	2,318,572	R0.5	73.0	0.00%	0	940,504	1,533,491	785,081	43.4	18,094	0.78%
333	WATERWHELLS, TURBINES, GENERATORS	646,591	S0	61.0	0.00%	0	355,538	572,782	73,809	27.5	2,688	0.42%
334	ACCESSORY ELECTRIC EQUIPMENT	288,958	S0	30.0	0.00%	0	92,764	137,501	151,457	20.4	7,436	2.57%
335	MISCELLANEOUS POWER PLANT EQUIPMENT											
	PROJECT	113,251	S6	39.0	0.00%	0	95,368	113,251	0	13.4	0	0.00%
	NON-PROJECT	3,141	S6	39.0	0.00%	0	1,599	3,141	0	19.1	0	0.00%
	TOTAL ACCOUNT 335	116,392		39.0	0.00%	0	96,967	116,392	0	0.0	0	0.00%
336	ROADS, RAILROADS, BRIDGES	40,769	SQ	50.0	0.00%	0	34,955	40,769	0	1.0	0	0.00%
	TOTAL SMITH	4,470,584		60.4	0.00%	0	1,899,555	3,000,277	1,470,307	38.3	40,563	0.91%
	TOTAL HYDRAULIC PRODUCTION	39,810,994		58.2	0.00%	0	11,807,535	17,891,430	21,919,564	46.0	515,162	1.29%

Public Service Co of New Hampshire
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As of: January 1, 2003

Account:	Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	OTHER PRODUCTION PLANT											
	LOST NATION CT UNIT 10											
341	STRUCTURES & IMPROVEMENTS	209,700	2007	27.9	0.00%	0	175,898	205,950	3,750	4.50	833	0.40%
342	FUEL HOLDERS, PRODUCERS, ACCESSORIES	157,016	2007	20.8	0.00%	0	123,050	147,089	9,927	4.50	2,206	1.40%
343	PRIME MOVERS	1,318,246	2007	38.0	0.00%	0	1,162,125	1,318,246	(0)	4.50	(0)	0.00%
345	ACCESSORY ELECTRIC EQUIPMENT	61,392	2007	22.8	0.00%	0	49,250	48,270	13,122	4.50	2,916	4.75%
346	MISCELLANEOUS POWER PLANT EQUIPMENT	12,306	2007	27.5	0.00%	0	10,293	12,035	271	4.50	60	0.49%
	TOTAL LOST NATION	1,758,660		33.2	0.00%	0	1,520,615	1,731,591	27,069	4.50	6,015	0.34%
	MERRIMACK CT											
341	STRUCTURES & IMPROVEMENTS											
	UNIT 1	38,016	2007	39.0	0.00%	0	33,630	38,016	(0)	4.50	(0)	0.00%
	UNIT 2	36,746	2007	38.0	0.00%	0	32,394	36,746	0	4.50	0	0.00%
	TOTAL ACCOUNT 341	74,762		38.5	0.00%	0	66,024	74,762	(0)	4.50	(0)	0.00%
342	FUEL HOLDERS, PRODUCERS, ACCESSORIES											
	UNIT 1	201,072	2007	19.4	0.00%	0	154,526	199,090	1,982	4.50	440	0.22%
	UNIT 2	37,554	2007	38.0	0.00%	0	33,107	37,554	(0)	4.50	(0)	0.00%
	TOTAL ACCOUNT 342	238,626		21.1	0.00%	0	187,633	236,645	1,981	4.50	440	0.18%
343	PRIME MOVERS											
	UNIT 1	207,481	2007	19.0	0.00%	0	158,266	202,782	4,699	4.50	1,044	0.50%
	UNIT 2	53,315	2007	22.6	0.00%	0	42,683	53,315	0	4.50	0	0.00%
	TOTAL ACCOUNT 343	260,796		19.6	0.00%	0	200,948	256,097	4,699	4.50	1,044	0.40%
344	GENERATORS											
	UNIT 1	1,338,644	2007	39.0	0.00%	0	1,184,185	1,338,644	0	4.50	0	0.00%
	UNIT 2	1,449,068	2007	38.0	0.00%	0	1,277,468	1,449,068	(0)	4.50	(0)	0.00%
	TOTAL ACCOUNT 344	2,787,712		38.5	0.00%	0	2,461,653	2,787,712	(0)	4.50	(0)	0.00%
345	ACCESSORY ELECTRIC EQUIPMENT											
	UNIT 1	886	2007	35.0	0.00%	0	773	886	0	4.50	0	0.00%
	UNIT 2	28,983	2007	32.9	0.00%	0	25,015	28,709	274	4.50	61	0.21%
	TOTAL ACCOUNT 345	29,870		32.9	0.00%	0	25,787	29,596	274	4.50	61	0.20%
346	MISCELLANEOUS POWER PLANT EQUIPMENT											
	UNIT 1	6,828	2007	25.2	0.00%	0	5,610	6,817	11	4.50	2	0.03%
	UNIT 2	3,801	2007	20.5	0.00%	0	2,969	3,607	194	4.50	43	1.13%
	TOTAL ACCOUNT 346	10,629		23.3	0.00%	0	8,579	10,425	204	4.50	45	0.43%
	TOTAL MERRIMACK	3,402,395		33.9	0.00%	0	2,950,625	3,395,236	7,159	4.50	1,591	0.05%

Public Service Co of New Hampshire
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	SCHILLER CT UNIT 10											
341	STRUCTURES & IMPROVEMENTS	57,843	2007	25.9	0.00%	0	47,789	46,217	11,626	4.50	2,583	4.47%
342	FUEL HOLDERS, PRODUCERS, ACCESSORIES	49,907	2007	36.1	0.00%	0	43,690	49,907	0	4.50	0	0.00%
343	PRIME MOVERS	150,292	2007	10.4	0.00%	0	85,471	70,025	80,267	4.50	17,837	11.87%
344	GENERATORS	1,671,810	2007	36.5	0.00%	0	1,465,475	1,671,810	0	4.50	0	0.00%
345	ACCESSORY ELECTRIC EQUIPMENT	28,808	2007	13.5	0.00%	0	19,237	27,719	1,089	4.50	242	0.84%
346	MISCELLANEOUS POWER PLANT EQUIPMENT	6,842	2007	29.7	0.00%	0	5,805	6,842	(0)	4.50	(0)	0.00%
	TOTAL SCHILLER	1,965,502		29.7	0.00%	0	1,667,467	1,872,520	92,982	4.50	20,663	1.05%
	WHITE LAKE CT UNIT 10											
341	STRUCTURES & IMPROVEMENTS	48,099	2007	36.5	0.00%	0	42,164	48,099	(0)	4.50	(0)	0.00%
342	FUEL HOLDERS, PRODUCERS, ACCESSORIES	170,292	2007	18.6	0.00%	0	129,149	156,495	13,797	4.50	3,066	1.80%
343	PRIME MOVERS	1,458,296	2007	35.7	0.00%	0	1,274,485	1,458,296	(0)	4.50	(0)	0.00%
345	ACCESSORY ELECTRIC EQUIPMENT	13,825	2007	14.5	0.00%	0	9,545	11,949	1,876	4.50	417	3.01%
346	MISCELLANEOUS POWER PLANT EQUIPMENT	20,040	2007	7.7	0.00%	0	8,378	6,226	13,814	4.50	3,070	15.32%
	TOTAL WHITE LAKE	1,710,552		31.2	0.00%	0	1,463,722	1,681,065	29,487	4.50	6,553	0.38%
	TOTAL OTHER PRODUCTION	8,837,109		32.2	0.00%	0	7,602,429	8,680,411	156,698	4.50	34,822	0.39%

Public Service Co of New Hampshire
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Account:	Acct Description	Plant Balance	Dispersion	Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	TRANSMISSION PLANT											
350.2	EASEMENTS											
	SYSTEM	10,608,639	SQ	65.00	0.00%	0	0	0	10,608,639	65.00	163,210	1.538%
352	STRUCTURES & IMPROVEMENTS											
	SYSTEM	2,033,232	L3	50.00	0.00%	0	965,551	1,169,033	864,199	26.26	32,915	1.619%
353	STATION EQUIPMENT											
	SYSTEM	36,911,240	R3	55.00	-20.00%	(7,382,248)	16,241,763	19,508,466	24,785,021	34.83	711,552	1.928%
354	TOWERS & FIXTURES											
	SYSTEM	2,334,614	L4	50.00	-25.00%	(583,654)	1,524,963	2,113,288	804,980	22.36	36,007	1.542%
	345 KV SYSTEM	9,011,697	L4	50.00	-25.00%	(2,252,924)	5,178,561	7,231,923	4,032,698	25.49	158,190	1.755%
	TOTAL ACCOUNT 354	11,346,311		50.00	-25.00%	(2,836,578)	6,703,524	9,345,211	4,837,678	24.97	194,197	1.712%
355	POLES & FIXTURES											
	SYSTEM	20,271,098	R2	50.00	-40.00%	(8,108,439)	10,905,162	13,445,129	14,934,408	30.79	485,089	2.393%
	345 KV SYSTEM	12,658,368	R2	50.00	-40.00%	(5,063,347)	7,076,695	8,918,474	8,803,241	30.03	293,111	2.316%
	TOTAL ACCOUNT 355	32,929,466		50.00	-40.00%	(13,171,786)	17,981,857	22,363,603	23,737,650	30.51	778,200	2.363%
356	OVERHEAD CONDUCTORS & DEVICES											
	SYSTEM	14,938,736	S4	50.00	-20.00%	(2,987,747)	7,781,842	9,675,150	8,251,333	28.30	291,533	1.952%
	345 KV SYSTEM	17,180,586	S4	50.00	-20.00%	(3,436,117)	10,360,964	12,881,768	7,734,935	24.87	310,985	1.810%
	TOTAL ACCOUNT 356	32,119,322		50.00	-20.00%	(6,423,864)	18,142,806	22,556,918	15,986,268	26.64	602,518	1.876%
357	UNDERGROUND CONDUIT	421	SQ	61.00	-10.00%	(42)	339	406	57	16.39	3	0.825%
358	UNDRGRND CONDUCTORS & DEVICES	(0)	R4	49.00	-5.00%	0	(0)	(0)	(0)	16.11	(0)	1.060%
359	ROADS & TRAILS											
	SYSTEM	179,913	SQ	65.00	0.00%	0	71,041	90,605	89,308	39.34	2,270	1.262%
	345 KV SYSTEM	513,594	SQ	65.00	0.00%	0	173,750	221,599	291,995	43.01	6,789	1.322%
	TOTAL ACCOUNT 359	693,507		65.00	0.00%	0	244,791	312,204	381,303	42.15	9,059	1.306%
	TOTAL TRANSMISSION PLANT	126,642,138		56.28	-23.54%	(29,814,519)	60,280,631	75,255,842	81,200,815	35.25	2,491,655	1.967%

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11/06/2003

Public Service Co of New Hampshire
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	DISTRIBUTION PLANT											
350.2	EASEMENTS											
	SYSTEM	603,300	SQ	65.00	0.00%	0	0	0	603,300	65.00	9,282	1.538%
361	STRUCTURES & IMPROVEMENTS											
	SYSTEM	1,101,081	L3	50.00	0.00%	0	598,060	824,484	276,596	22.92	12,065	1.10%
	34.5 KV	4,837,264	L3	50.00	0.00%	0	2,297,143	2,781,247	2,056,017	26.26	78,307	1.62%
	TOTAL ACCOUNT 361	5,938,344		50.00	0.00%	0	2,895,203	3,605,731	2,332,613	25.86	90,373	1.52%
362	STATION EQUIPMENT											
	SYSTEM	17,210,535	R1	50.00	-10.00%	(1,721,053)	7,077,752	7,711,600	11,219,988	31.31	358,385	2.08%
	34.5 KV	42,748,429	R3	55.00	-20.00%	(8,549,686)	18,810,256	22,816,428	28,481,687	34.83	817,680	1.91%
	TOTAL ACCOUNT 362	59,958,963		53.47	-17.13%	(10,270,739)	25,888,008	30,528,028	39,701,675	33.84	1,176,065	1.96%
364	POLES, TOWERS, & FIXTURES											
	SYSTEM	123,431,841	S1	26.00	-15.00%	(18,514,776)	59,723,465	68,655,314	73,291,303	15.07	4,864,420	3.94%
	34.5 KV TOWERS	198,432	L4	50.00	-25.00%	(49,608)	129,615	179,620	68,420	22.36	3,060	1.54%
	34.5 KV POLES	11,221,459	R2	50.00	-40.00%	(4,488,584)	6,273,387	7,906,097	7,803,945	30.79	253,483	2.26%
	TOTAL ACCOUNT 364	134,851,732		27.10	-17.10%	(23,052,968)	66,126,467	76,741,031	81,163,668	16.58	5,120,963	3.80%
365	OVERHEAD CONDUCTORS & DEVICES											
	SYSTEM	200,269,342	R2	36.00	-20.00%	(40,053,868)	58,217,542	52,313,139	188,010,071	27.28	6,891,681	3.44%
	ROADS & TRAILS	257,593	SQ	65.00	0.00%	0	101,713	129,725	127,868	39.34	3,251	1.26%
	34.5 KV	9,841,340	S4	50.00	-20.00%	(1,968,268)	5,126,522	6,373,795	5,435,813	28.30	192,056	1.95%
	TOTAL ACCOUNT 365	210,368,275		36.50	-19.98%	(42,022,136)	63,445,777	58,816,659	193,573,752	27.32	7,086,988	3.37%
366	UNDERGROUND CONDUIT											
	DUCT SYSTEM	6,826,892	R3	70.00	-15.00%	(1,024,034)	2,055,664	2,271,819	5,579,107	51.67	107,973	1.58%
	34.5 KV	265,979	SQ	61.00	-10.00%	(26,598)	214,001	256,603	35,974	16.39	2,196	0.83%
	DIRECT BURIAL	2,245,443	R3	70.00	-15.00%	(336,816)	247,585	273,403	2,308,856	63.29	36,481	1.62%
	TOTAL ACCOUNT 366	9,338,314		69.71	-14.86%	(1,387,448)	2,517,250	2,801,824	7,923,938	54.90	146,650	1.57%
367	UNDERGROUND CONDUCTORS & DEVICES											
	DUCT SYSTEM	2,846,124	R2.5	40.00	-15.00%	(426,919)	1,752,535	1,794,099	1,478,944	18.58	79,608	2.80%
	34.5 KV	791,206	R4	49.00	-5.00%	(39,560)	557,571	695,616	135,150	16.11	8,389	1.06%
	DIRECT BURIAL	44,867,181	R2.5	40.00	-15.00%	(6,730,077)	12,576,933	12,885,566	38,711,692	30.25	1,279,729	2.85%
	TOTAL ACCOUNT 367	48,504,511		40.12	-14.84%	(7,196,556)	14,887,039	15,375,281	40,325,786	29.77	1,367,726	2.82%

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368	LINE TRANSFORMERS	138,077,302	R2	40.00	0.00%	0	40,745,153	55,170,392	82,906,910	28.20	2,940,334	2.13%
369	SERVICES											
	OVERHEAD	24,359,014	R1	33.00	-45.00%	(10,961,556)	11,792,163	13,770,900	21,549,670	21.98	980,312	4.02%
	DUCT SYSTEM	260,872	R1	33.00	-45.00%	(117,392)	183,783	214,381	163,883	16.97	9,659	3.70%
	DIRECT BURIAL	20,181,693	R1	33.00	-45.00%	(9,081,762)	6,766,537	7,893,117	21,370,338	25.37	842,365	4.17%
	TOTAL ACCOUNT 369	44,801,579		33.00	-45.00%	(20,160,711)	18,742,483	21,878,398	43,083,892	23.64	1,832,336	4.09%
370	METERS	49,124,861	S6	35.00	0.00%	0	21,753,563	19,408,744	29,716,117	19.84	1,497,945	3.05%
371	INSTALLATIONS ON CUSTOMERS' PREMISE	7,703,465	S3	17.00	-15.00%	(1,155,520)	4,605,459	3,662,770	5,196,214	8.45	615,056	7.98%
373	STREET LGHTING & SIGNAL SYSTEMS	4,437,609	R2	20.00	-15.00%	(665,641)	2,767,964	2,100,572	3,002,678	10.09	297,671	6.71%
	TOTAL DISTRIBUTION	713,708,255		35.31	-14.84%	(105,911,719)	264,374,366	290,089,432	529,530,542	25.93	22,181,389	3.11%

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11/06/2003

Public Service Co of New Hampshire
Remaining Life Depreciation Accrual Summary
As of: January 1, 2003

Account	Acct Description	Plant Balance	Dispersion		Avg Dollar Svc Life	Future Net Salvage Rate	Future Net Salvage Expectancy	Theoretical Reserve	Accumulated Reserve	Net Unrecovered Plant	Avg Remaining Life	Accrual (Dollars)	Accrual Rate (Gross)
	Intangible Plant												
303	Intangible Plant	10,329,075	SQ	2,065,815	5.00	0.00%	0	5,483,103	2,838,428	7,490,647	4.64	1,615,539	15.64%

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	GENERAL PLANT												
390	STRUCTURES & IMPROVEMENTS	43,794,591	R1.5	1,094,865	40.00	0.00%	0	3,569,299	6,153,030	37,641,561	36.81	1,022,683	2.34%
391	OFFICE FURNITURE & EQUIPMENT												
	SYSTEM LESS PC's	8,940,881	S4	388,734	23.00	2.00%	178,818	5,034,656	5,430,225	3,331,838	11.40	292,326	3.27%
	PC EQUIPMENT	6,018,997	SQ	1,504,749	4.00	0.00%	0	5,730,289	4,082,369	1,936,629	1.44	1,346,671	22.37%
	TOTAL ACCOUNT 391	14,959,879	S4	1,893,483	7.9	1.20%	178,818	10,764,944	9,512,594	5,268,467	3.21	1,638,996	10.96%
393	STORES EQUIPMENT	550,107	SQ	22,004	25.00	0.00%	0	340,930	345,385	204,722	11.95	17,137	3.12%
394	TOOLS, SHOP AND GARAGE EQUIPMENT	4,495,441	SQ	187,310	24.00	10.00%	449,544	2,260,274	2,906,416	1,139,481	13.73	83,014	1.85%
395	LABORATORY EQUIPMENT	2,869,730	SQ	102,490	28.00	0.00%	0	1,478,057	1,677,409	1,192,321	15.48	77,026	2.68%
398	MISCELLANEOUS EQUIPMENT	650,386	SQ	32,519	20.00	0.00%	0	350,220	524,595	125,791	11.84	10,626	1.63%
		8,565,664		344,324	24.9	5.25%	449,544	4,429,481	5,453,805	2,662,314	14.29	187,803	2.19%
397	COMMUNICATIONS EQUIPMENT												
	MISCELLANEOUS	17,116,487	L4	950,916	18.00	0.00%	0	8,936,942	10,945,329	6,171,158	8.61	716,570	4.19%
	MICROWAVE	5,383,376	L4	299,076	18.00	0.00%	0	2,069,462	2,534,529	2,848,847	11.08	257,074	4.78%
	TOTAL ACCOUNT 397	22,499,863		1,249,992	18.0	0.00%	0	11,006,404	13,479,858	9,020,005	9.39	973,644	4.33%
392.04	TRANSPORTATION EQUIPMENT												
	CLASS 1 AUTOS	507,453	SC	63,432	8.00	10.00%	50,745	426,182	473,013	(16,305)	1.00	0	0.00%
	CLASS 2 LIGHT TRUCKS	1,651,876	SC	183,542	9.00	10.00%	165,188	1,307,070	1,450,697	35,991	1.63	22,053	1.34%
	CLASS 4 HEAVY TRUCKS	4,952,104	SQ	353,722	14.00	10.00%	495,210	4,328,692	4,804,348	(347,454)	1.00	0	0.00%
	TOTAL ACCOUNT 392	7,111,433		600,695	11.8	10.00%	711,143	6,061,944	6,728,058	(327,768)	0.93	22,053	0.31%
396	POWER OPERATED EQUIPMENT	214,062	SQ	21,406	10.00	0.00%	0	214,062	197,779	16,283	1.00	16,283	7.61%
		7,325,495		622,101	11.8	9.71%	711,143	6,276,006	6,925,837	(311,485)	0.93	38,336	0.52%
		97,145,492		5,204,766	18.7	1.38%	1,339,505	36,046,134	41,525,124	54,280,863	28.53	3,861,463	3.97%

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/22/2014 | **Date of Response: 09/19/2014**
Request No. OCA 2-006 | **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Frederick White

Request:
Please quantify the percent of impact that migration has on PSNH's obligations reported in column 3?

Response:
The table below shows the impact of migration on the figures shown in column 3 of FBW-5, i.e., the figures in column 3 are these percentages lower than they would otherwise be absent migration.

2013	Impact of Migration
Jan	42.8%
Feb	43.4%
Mar	45.1%
Apr	47.8%
May	49.4%
Jun	50.8%
Jul	50.8%
Aug	51.4%
Sep	51.8%
Oct	52.0%
Nov	51.9%
Dec	50.7%

Note - These figures also include the impact of 3rd party supplier defaults in February, March, and December, 2013.

Witness: **Frederick White, Richard C. Labrecque**

Request:
Please provide a copy of the Company's report submitted to the PUC's Sustainable Energy Division detailing its compliance with NH's Renewable Portfolio Standard requirements for calendar year 2013.

Response:
See attached.

Pursuant to Puc 203.08(d) and RSA 363:28, VI, PSNH provides this response on a confidential basis to the Commission Staff and the Office of Consumer Advocate. PSNH submits that it has a good faith basis for seeking confidential treatment of the documents in this response and that it intends to submit a motion for confidential treatment of the documents prior to the commencement of any hearing in this proceeding.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/22/2014 **Date of Response: 09/19/2014**
Request No. OCA 2-008 **Page 1 of 1**
Request from: Office of Consumer Advocate

Witness: Frederick White, Richard C. Labrecque

Request:
Please provide details on energy generated from the Company's solar photo-voltaic facility located at Energy Park in Manchester during 2013. Please provide monthly generation details. Please also specify the total number of and Class of RECS claimed from this generation and used in the Company's compliance with RPS requirements.

Response:
The table below provides the 2013 monthly generation details and the number of NH Class II RECs created.
All of the RECs created were used for RPS compliance.
Note: the January meter reading was deferred until February. Thus, the initial entry in the table is for the combined production in both January and February.

Month	Generation (kWh)	RECs
Jan & Feb	2680	3
Mar	2620	2
Apr	6600	7
May	7880	8
Jun	7900	8
Jul	6340	6
Aug	8200	8
Sep	5940	6
Oct	4320	4
Nov	3020	3
Dec	980	1
	56480	56

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. CLF 1-004 | **Page 1 of 3**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Please provide, for each fossil-fired PSNH generating unit, a schedule showing weekly energy output provided into the ISO-NE system in 2013, the amount paid for such output by ISO-NE for each week, and the average ISO-NE revenues per MWh exclusive of NCPC. On the schedule, please indicate, for each week, the number of hours in which PSNH received NCPC in addition to LMPs and the amount of such NCPC payments.

Response:
Please see the attached tables.

PSNH Fossil-Fired Generation - Energy Market and NCPC

	Merrimack 1						Merrimack 2						Newington					
		Energy Market			NCPC			Energy Market			NCPC			Energy Market			NCPC	
	Generation	Revenue			Revenue		Generation	Revenue			Revenue		Generation	Revenue			Revenue	
Week Beginning	MWh	$(000)	$/MWh	Hours	$(000)	$/MWh	MWh	$(000)	$/MWh	Hours	$(000)	$/MWh	MWh	$(000)	$/MWh	Hours	$(000)	$/MWh
1/1/13	14,336	1,035	72.2	0	0	0.0	42,513	3,049	71.7	0	0	0.0	3,360	204	60.8	31	716	213.2
1/7/13	4,171	180	43.1	1	0	0.0	46,867	1,753	37.4	14	0	0.0	0	0	0.0	0	0	0.0
1/14/13	11,448	819	71.5	18	21	1.8	50,667	3,147	62.1	7	0	0.0	0	0	0.0	0	0	0.0
1/21/13	18,315	3,052	166.6	0	0	0.0	53,933	8,985	166.6	0	0	0.0	11,607	2,609	224.7	13	147	12.6
1/28/13	16,417	1,795	109.3	29	4	0.2	50,605	5,412	107.0	15	10	0.2	2,170	165	75.8	11	175	80.9
2/4/13	18,063	2,849	157.7	0	0	0.0	53,352	8,436	158.1	0	0	0.0	11,457	2,065	180.3	66	1,175	102.6
2/11/13	17,817	2,524	141.6	0	0	0.0	52,673	7,498	142.4	1	0	0.0	6,738	1,244	184.7	40	640	95.0
2/18/13	17,248	1,508	87.4	0	0	0.0	51,824	4,480	86.4	1	0	0.0	1,609	195	121.3	14	296	184.3
2/25/13	15,307	677	44.2	4	1	0.0	48,132	2,111	43.9	6	1	0.0	0	0	0.0	0	0	0.0
3/4/13	16,536	848	51.3	0	0	0.0	50,198	2,561	51.0	4	0	0.0	0	0	0.0	0	0	0.0
3/11/13	15,973	797	49.9	8	1	0.0	48,900	2,422	49.5	24	1	0.0	0	0	0.0	0	0	0.0
3/18/13	16,546	1,103	66.7	0	0	0.0	22,240	1,271	57.1	0	0	0.0	1,699	169	99.6	1	0	0.2
3/25/13	10,885	537	49.4	0	0	0.0	33,396	1,601	47.9	4	0	0.0	1,953	174	88.9	14	87	44.3
4/1/13	3,569	205	57.6	42	21	5.9	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
4/8/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
4/15/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
4/22/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
4/29/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
5/6/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
5/13/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
5/20/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
5/27/13	8,906	466	52.3	18	7	0.8	20,767	1,031	49.7	7	0	0.0	2,177	150	68.9	19	310	142.5
6/3/13	6,453	214	33.2	1	0	0.1	17,363	576	33.2	2	0	0.0	0	0	0.0	0	0	0.0
6/10/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
6/17/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
6/24/13	6,740	372	55.2	41	27	4.0	12,988	770	59.3	4	111	8.6	956	55	57.2	9	257	269.1
7/1/13	6,661	422	63.3	15	2	0.3	18,530	1,191	64.3	14	43	2.3	2,733	341	124.8	0	0	0.0
7/8/13	15,442	680	44.0	27	2	0.1	43,743	1,951	44.6	2	1	0.0	0	0	0.0	0	0	0.0
7/15/13	16,379	1,329	81.2	0	0	0.0	48,587	4,013	82.6	2	0	0.0	14,091	1,866	132.4	81	1,338	95.0
7/22/13	0	0	0.0	0	0	0.0	12,013	552	46.0	0	0	0.0	1,024	63	61.5	8	83	80.9
7/29/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
8/5/13	7,436	235	31.6	0	0	0.0	17,690	569	32.2	0	0	0.0	974	34	34.6	9	100	103.0
8/12/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
8/19/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	5,624	259	46.0	11	121	21.5
8/26/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	1,010	72	71.4	8	89	88.4
9/2/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
9/9/13	3,595	260	72.3	0	0	0.0	8,780	405	46.1	0	0	0.0	983	54	55.0	9	108	109.9
9/16/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
9/23/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
9/30/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/7/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/14/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/21/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/28/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
11/4/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
11/11/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	1,765	55	30.9	7	199	112.8
11/18/13	5,677	334	58.8	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
11/25/13	15,864	1,081	68.1	7	4	0.3	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
12/2/13	15,121	787	52.0	0	0	0.0	8,659	438	50.6	0	0	0.0	0	0	0.0	0	0	0.0
12/9/13	18,079	2,738	151.4	0	0	0.0	52,963	8,111	153.1	0	0	0.0	1,452	269	185.1	10	204	140.1
12/16/13	16,768	2,052	122.4	13	4	0.2	48,943	6,047	123.6	13	7	0.1	7,452	1,366	183.4	47	431	57.8
12/23/13	16,415	1,001	61.0	15	1	0.1	40,338	2,382	59.1	9	0	0.0	0	0	0.0	0	0	0.0
12/30/13	4,133	515	124.7	0	0	0.0	652	36	55.6	0	0	0.0	0	0	0.0	0	0	0.0
Total	360,300	30,414	84.4	239	95	0.3	957,314	80,799	84.4	129	176	0.2	80,834	11,408	141.1	408	6,478	80.1

PSNH Fossil-Fired Generation - Energy Market and NCPC

	Schiller 4						Schiller 6					
		Energy Market Revenue			NCPC Revenue			Energy Market Revenue			NCPC Revenue	
Week Beginning	Generation MWh	$(000)	$/MWh	Hours	$(000)	$/MWh	Generation MWh	$(000)	$/MWh	Hours	$(000)	$/MWh
1/1/13	3,943	343	86.9	0	0	0.0	4,189	357	85.2	7	5	1.3
1/7/13	244	12	48.5	8	13	53.4	1,052	49	46.6	33	35	33.4
1/14/13	3,044	255	83.8	8	11	3.7	3,293	270	82.1	20	20	6.0
1/21/13	7,080	1,213	171.4	0	0	0.0	6,748	1,167	172.9	0	0	0.0
1/28/13	4,348	636	146.3	0	0	0.0	2,614	417	159.4	0	0	0.0
2/4/13	7,100	1,185	166.9	1	0	0.0	7,121	1,187	166.7	1	0	0.0
2/11/13	6,998	1,047	149.7	0	0	0.0	7,010	1,049	149.6	0	0	0.0
2/18/13	2,089	251	120.1	0	0	0.0	4,977	536	107.8	0	0	0.0
2/25/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
3/4/13	2,311	144	62.1	60	22	9.3	2,918	176	60.4	60	21	7.1
3/11/13	1,489	99	66.3	42	6	3.8	0	0	0.0	0	0	0.0
3/18/13	4,428	341	77.1	24	1	0.2	0	0	0.0	0	0	0.0
3/25/13	649	45	69.2	16	1	2.2	0	0	0.0	0	0	0.0
4/1/13	391	20	51.4	14	14	34.9	0	0	0.0	0	0	0.0
4/8/13	382	17	45.4	13	15	39.3	1,017	45	44.6	15	13	12.8
4/15/13	662	30	46.0	23	26	38.7	504	24	46.9	17	12	24.4
4/22/13	2,261	109	48.4	77	60	26.3	1,109	51	46.3	40	42	37.7
4/29/13	2,996	145	48.3	101	71	23.7	2,066	102	49.6	73	55	26.5
5/6/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
5/13/13	635	28	43.4	2	2	2.6	0	0	0.0	0	0	0.0
5/20/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
5/27/13	956	68	71.4	26	14	14.3	1,592	112	70.5	32	16	10.1
6/3/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
6/10/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
6/17/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
6/24/13	1,310	133	101.4	13	4	3.4	1,374	135	98.2	11	4	2.9
7/1/13	1,675	134	80.2	17	6	3.3	1,564	123	78.9	18	8	5.2
7/8/13	546	34	63.0	8	7	13.3	360	27	75.7	1	0	0.7
7/15/13	3,877	425	109.7	6	1	0.2	4,332	449	103.6	9	0	0.0
7/22/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
7/29/13	1,609	60	37.0	0	0	0.0	0	0	0.0	0	0	0.0
8/5/13	0	0	0.0	0	0	0.0	991	34	34.5	0	0	0.0
8/12/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
8/19/13	2,954	132	44.7	0	0	0.0	0	0	0.0	0	0	0.0
8/26/13	1,512	74	49.2	0	0	0.0	0	0	0.0	0	0	0.0
9/2/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
9/9/13	854	74	87.2	1	1	0.7	907	79	87.2	2	1	1.4
9/16/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
9/23/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
9/30/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/7/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/14/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
10/21/13	0	0	0.0	0	0	0.0	658	25	38.7	16	11	16.5
10/28/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
11/4/13	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
11/11/13	682	49	72.1	19	4	5.6	676	49	71.9	19	5	8.1
11/18/13	1,539	117	76.3	17	3	2.2	1,487	114	76.5	17	5	3.1
11/25/13	5,465	396	72.5	7	0	0.0	5,498	398	72.4	34	1	0.2
12/2/13	2,173	138	63.5	0	0	0.0	1,859	120	64.4	1	0	0.0
12/9/13	7,064	1,108	156.9	0	0	0.0	7,027	1,103	157.0	3	0	0.0
12/16/13	4,957	761	153.5	0	0	0.0	4,901	754	153.8	1	1	0.1
12/23/13	4,998	357	71.4	40	6	1.2	3,669	257	70.2	40	8	2.3
12/30/13	1,735	239	137.6	0	0	0.0	452	93	206.4	0	0	0.0
Total	94,954	10,221	107.6	543	285	3.0	81,968	9,304	113.5	470	264	3.2

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. CLF 1-005 **Page 1 of 31**
Request from: Conservation Law Foundation

Witness: William H. Smagula, Frederick White

Request:
Please provide schedules explaining the reason for daily operation of each fossil-fired PSNH generating unit, similar to the format provided in PSNH's data response to Technical Session 2, Data Request 7, in Docket No. DE 13-108, showing the date, hours serving ES load, and reason for dispatch. On such schedules, please also provide an additional column indicating the average day-ahead and real-time ISO-NE market prices for energy for the hours that the unit was dispatched, for each day of unit operation.

Response:
Please see the attached tables for the requested information. Note that these tables also include information requested in Q-CLF 1-008. In addition to the reasons for dispatch identified in the tables, during a given operating period various other considerations may have included environmental/emissions tests, fuel inventory management, plant equipment operating requirements affecting reliability, and ISO-NE operating directives; as reasons for dispatch are not mutually exclusive and many factors could influence a given operating period.

Merrimack 1

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
1/1/13	24	(103,192)	91.1	Self-scheduled for load.
1/2/13	24	(132,532)	104.8	Self-scheduled for load.
1/3/13	24	(71,772)	76.5	Self-scheduled for load.
1/4/13	24	(40,416)	64.7	Self-scheduled for load.
1/5/13	24	5,024	46.7	Self-scheduled based on market price volatility, reliable op's, & for load.
1/6/13	24	11,153	44.0	Self-scheduled based on market price volatility, reliable op's, & for load.
1/7/13	24	2,548	47.8	Self-scheduled based on market price volatility, reliable op's, & for load.
1/8/13	24	22,259	38.2	Self-scheduled based on market price volatility, reliable op's, & for load.
1/9/13	0	0	-	
1/10/13	0	0	-	
1/11/13	0	0	-	
1/12/13	0	0	-	
1/13/13	0	0	-	
1/14/13	0	0	-	
1/15/13	0	0	-	
1/16/13	19	(33,323)	56.2	Dispatched by ISO-NE for load.
1/17/13	24	(38,193)	64.7	Self-scheduled for load.
1/18/13	24	(79,442)	81.5	Self-scheduled for load.
1/19/13	24	(66,108)	74.7	Self-scheduled for load.
1/20/13	24	(61,551)	76.4	Self-scheduled for load.
1/21/13	24	(90,669)	84.9	Self-scheduled for load.
1/22/13	24	(199,426)	125.3	Self-scheduled for load.
1/23/13	24	(326,576)	173.1	Self-scheduled for environmental testing (mercury/PM) & load.
1/24/13	24	(404,344)	202.7	Self-scheduled for load.
1/25/13	24	(482,181)	231.8	Self-scheduled for load.
1/26/13	24	(322,917)	171.6	Self-scheduled for load.
1/27/13	24	(327,733)	173.4	Self-scheduled for load.
1/28/13	24	(301,034)	163.7	Self-scheduled for load.
1/29/13	24	(39,575)	64.8	Self-scheduled for environmental testing (RATA) & load.
1/30/13	24	16,085	40.2	Self-scheduled based on market price volatility, reliable op's, & for load.
1/31/13	24	(2,893)	49.8	Self-scheduled for load.
2/1/13	24	(154,654)	107.8	Self-scheduled for environmental testing (RATA) & load.
2/2/13	24	(321,463)	180.5	Self-scheduled for load.
2/3/13	24	(190,133)	133.6	Self-scheduled for environmental testing (RATA) & load.
2/4/13	24	(318,429)	177.3	Self-scheduled for load.
2/5/13	24	(186,045)	120.2	Self-scheduled for load.
2/6/13	24	(157,113)	109.6	Self-scheduled for load.
2/7/13	24	(293,182)	163.1	Self-scheduled for load.
2/8/13	24	(189,766)	122.4	Self-scheduled for load.
2/9/13	24	(335,566)	179.1	Self-scheduled for load.
2/10/13	24	(483,633)	232.5	Self-scheduled for load.
2/11/13	24	(444,993)	217.7	Self-scheduled for load.
2/12/13	24	(444,279)	226.6	Self-scheduled for load.
2/13/13	24	(329,297)	175.6	Self-scheduled for load.
2/14/13	24	(153,508)	109.8	Self-scheduled for load.
2/15/13	24	(55,276)	70.3	Self-scheduled for load.
2/16/13	24	(107,060)	93.2	Self-scheduled for load.
2/17/13	24	(115,762)	94.8	Self-scheduled for load.
2/18/13	24	(188,257)	121.5	Self-scheduled for load.
2/19/13	24	(164,007)	111.9	Self-scheduled for load.
2/20/13	24	(120,637)	96.7	Self-scheduled for load.
2/21/13	24	(172,497)	114.7	Self-scheduled for load.
2/22/13	24	(57,065)	70.9	Self-scheduled for load.
2/23/13	24	19,397	39.9	Self-scheduled based on market price volatility, reliable op's, & for load.
2/24/13	24	20,535	39.5	Self-scheduled based on market price volatility, reliable op's, & for load.
2/25/13	24	2,897	47.7	Self-scheduled based on market price volatility, reliable op's, & for load.
2/26/13	24	124	49.0	Self-scheduled based on market price volatility, reliable op's, & for load.
2/27/13	24	2,504	48.0	Self-scheduled based on market price volatility, reliable op's, & for load.
2/28/13	24	(6,892)	52.1	Self-scheduled for load.

Merrimack 1

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
3/1/13	24	18,008	40.0	Self-scheduled based on market price volatility, reliable op's, & for load.
3/2/13	24	31,096	34.2	Self-scheduled based on market price volatility, reliable op's, & for load.
3/3/13	24	25,346	37.4	Self-scheduled based on market price volatility, reliable op's, & for load.
3/4/13	24	(6,661)	51.9	Self-scheduled for load.
3/5/13	24	(404)	49.2	Self-scheduled for load.
3/6/13	24	(5,831)	51.4	Self-scheduled for load.
3/7/13	24	(21,156)	57.3	Self-scheduled for load.
3/8/13	24	(18,745)	56.5	Self-scheduled for VAR testing & load.
3/9/13	24	5,682	46.6	Self-scheduled based on market price volatility, reliable op's, & for load.
3/10/13	23	10,127	44.2	Self-scheduled based on market price volatility, reliable op's, & for load.
3/11/13	24	6,525	46.0	Self-scheduled based on market price volatility, reliable op's, & for load.
3/12/13	24	16,825	41.4	Self-scheduled based on market price volatility, reliable op's, & for load.
3/13/13	24	18,074	40.4	Self-scheduled based on market price volatility, reliable op's, & for load.
3/14/13	24	(35,151)	63.9	Self-scheduled for load.
3/15/13	24	(19,358)	56.8	Self-scheduled for load.
3/16/13	24	(3,334)	50.5	Self-scheduled for load.
3/17/13	24	1,868	48.2	Self-scheduled for reliable operations & load.
3/18/13	24	(42,090)	66.2	Self-scheduled for load.
3/19/13	24	(57,781)	71.3	Self-scheduled for load.
3/20/13	24	(66,524)	74.9	Self-scheduled for load.
3/21/13	24	(96,865)	90.8	Self-scheduled for load.
3/22/13	24	(28,710)	61.2	Self-scheduled for load.
3/23/13	24	(4,890)	51.3	Self-scheduled for load.
3/24/13	24	4,819	46.7	Self-scheduled for reliable operations & load.
3/25/13	24	(29,272)	61.0	Self-scheduled for load.
3/26/13	24	(18,210)	57.3	Self-scheduled for load.
3/27/13	24	19,640	39.8	Self-scheduled based on market price volatility & for load.
3/28/13	24	19,790	39.7	Self-scheduled based on market price volatility & for load.
3/29/13	24	4,539	46.8	Self-scheduled based on market price volatility & for load.
3/30/13	0	0	-	
3/31/13	0	0	-	
4/1/13	0	0	-	
4/2/13	20	(35,566)	61.7	Dispatched by ISO-NE for load.
4/3/13	24	(14,934)	54.4	Dispatched by ISO-NE for load.
4/4/13	2	(996)	65.5	Dispatched by ISO-NE for load.
4/5/13	0	0	-	
4/6/13	0	0	-	
4/7/13	0	0	-	
4/8/13	0	0	-	
4/9/13	0	0	-	
4/10/13	0	0	-	
4/11/13	0	0	-	
4/12/13	0	0	-	
4/13/13	0	0	-	
4/14/13	0	0	-	
4/15/13	0	0	-	
4/16/13	0	0	-	
4/17/13	0	0	-	
4/18/13	0	0	-	
4/19/13	0	0	-	
4/20/13	0	0	-	
4/21/13	0	0	-	
4/22/13	0	0	-	
4/23/13	0	0	-	
4/24/13	0	0	-	
4/25/13	0	0	-	
4/26/13	0	0	-	
4/27/13	0	0	-	
4/28/13	0	0	-	
4/29/13	0	0	-	
4/30/13	0	0	-	

Merrimack 1

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
5/1/13	0	0	-	
5/2/13	0	0	-	
5/3/13	0	0	-	
5/4/13	0	0	-	
5/5/13	0	0	-	
5/6/13	0	0	-	
5/7/13	0	0	-	
5/8/13	0	0	-	
5/9/13	0	0	-	
5/10/13	0	0	-	
5/11/13	0	0	-	
5/12/13	0	0	-	
5/13/13	0	0	-	
5/14/13	0	0	-	
5/15/13	0	0	-	
5/16/13	0	0	-	
5/17/13	0	0	-	
5/18/13	0	0	-	
5/19/13	0	0	-	
5/20/13	0	0	-	
5/21/13	0	0	-	
5/22/13	0	0	-	
5/23/13	0	0	-	
5/24/13	0	0	-	
5/25/13	0	0	-	
5/26/13	0	0	-	
5/27/13	0	0	-	
5/28/13	0	0	-	
5/29/13	0	0	-	
5/30/13	19	(34,947)	66.3	Dispatched by ISO-NE for load.
5/31/13	24	(27,063)	60.0	Self-scheduled for load.
6/1/13	24	9,449	45.1	Self-scheduled for ISO-NE capability audit & load.
6/2/13	24	15,865	42.5	Self-scheduled based on market price volatility & for load.
6/3/13	24	17,587	40.7	Self-scheduled based on market price volatility & for load.
6/4/13	24	38,407	30.6	Self-scheduled based on market price volatility & for load.
6/5/13	24	45,733	28.7	Self-scheduled based on market price volatility & for load.
6/6/13	0	0	-	
6/7/13	0	0	-	
6/8/13	0	0	-	
6/9/13	0	0	-	
6/10/13	0	0	-	
6/11/13	0	0	-	
6/12/13	0	0	-	
6/13/13	0	0	-	
6/14/13	0	0	-	
6/15/13	0	0	-	
6/16/13	0	0	-	
6/17/13	0	0	-	
6/18/13	0	0	-	
6/19/13	0	0	-	
6/20/13	0	0	-	
6/21/13	0	0	-	
6/22/13	0	0	-	
6/23/13	0	0	-	
6/24/13	11	(56,467)	118.3	Dispatched by ISO-NE for load.
6/25/13	24	(4,779)	46.9	Self-scheduled for load.
6/26/13	24	(8,686)	53.2	Self-scheduled for load.
6/27/13	19	1,163	36.7	Self-scheduled for load.
6/28/13	0	0	-	
6/29/13	0	0	-	
6/30/13	0	0	-	

Merrimack 1

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
7/1/13	0	0	-	
7/2/13	0	0	-	
7/3/13	0	0	-	
7/4/13	0	0	-	
7/5/13	19	(19,994)	58.9	Dispatched by ISO-NE for load.
7/6/13	24	(37,974)	64.5	Self-scheduled for load.
7/7/13	24	(39,316)	65.5	Self-scheduled for load.
7/8/13	24	(18,492)	56.7	Self-scheduled for load.
7/9/13	24	1,702	47.7	Self-scheduled based on market price volatility, reliable op's, & for load.
7/10/13	24	3,178	47.6	Self-scheduled based on market price volatility, reliable op's, & for load.
7/11/13	24	10,448	44.3	Self-scheduled based on market price volatility, reliable op's, & for load.
7/12/13	24	29,044	34.9	Self-scheduled based on market price volatility, reliable op's, & for load.
7/13/13	24	27,974	34.9	Self-scheduled based on market price volatility, reliable op's, & for load.
7/14/13	24	22,051	39.7	Self-scheduled based on market price volatility, reliable op's, & for load.
7/15/13	24	(33,718)	63.0	Self-scheduled for load.
7/16/13	24	(109,142)	92.0	Self-scheduled for environmental testing (RATA/mercury/PM) & load.
7/17/13	24	(126,260)	100.4	Self-scheduled for load.
7/18/13	24	(132,838)	102.5	Self-scheduled for load.
7/19/13	24	(122,731)	101.6	Self-scheduled for load.
7/20/13	24	(14,322)	55.1	Self-scheduled for load.
7/21/13	24	12,846	41.9	Self-scheduled for environmental testing (RATA) & load.
7/22/13	0	0	-	
7/23/13	0	0	-	
7/24/13	0	0	-	
7/25/13	0	0	-	
7/26/13	0	0	-	
7/27/13	0	0	-	
7/28/13	0	0	-	
7/29/13	0	0	-	
7/30/13	0	0	-	
7/31/13	0	0	-	
8/1/13	0	0	-	
8/2/13	0	0	-	
8/3/13	0	0	-	
8/4/13	0	0	-	
8/5/13	9	14,004	22.2	Self-scheduled for Clean Air Project testing & load.
8/6/13	24	44,533	26.6	Self-scheduled for Clean Air Project & VAR testing, & load.
8/7/13	24	42,151	30.0	Self-scheduled for Clean Air Project testing & load.
8/8/13	24	23,127	39.4	Self-scheduled for Clean Air Project testing & load.
8/9/13	9	5,908	29.4	Self-scheduled for Clean Air Project testing & load.
8/10/13	0	0	-	
8/11/13	0	0	-	
8/12/13	0	0	-	
8/13/13	0	0	-	
8/14/13	0	0	-	
8/15/13	0	0	-	
8/16/13	0	0	-	
8/17/13	0	0	-	
8/18/13	0	0	-	
8/19/13	0	0	-	
8/20/13	0	0	-	
8/21/13	0	0	-	
8/22/13	0	0	-	
8/23/13	0	0	-	
8/24/13	0	0	-	
8/25/13	0	0	-	
8/26/13	0	0	-	
8/27/13	0	0	-	
8/28/13	0	0	-	
8/29/13	0	0	-	
8/30/13	0	0	-	
8/31/13	0	0	-	

Merrimack 1

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
9/1/13	0	0	-	
9/2/13	0	0	-	
9/3/13	0	0	-	
9/4/13	0	0	-	
9/5/13	0	0	-	
9/6/13	0	0	-	
9/7/13	0	0	-	
9/8/13	0	0	-	
9/9/13	0	0	-	
9/10/13	0	0	-	
9/11/13	16	(62,737)	93.9	Dispatched by ISO-NE for load.
9/12/13	24	(22,077)	59.3	Dispatched by ISO-NE for load.
9/13/13	1	1,085	28.3	Dispatched by ISO-NE for load.
9/14/13	0	0	-	
9/15/13	0	0	-	
9/16/13	0	0	-	
9/17/13	0	0	-	
9/18/13	0	0	-	
9/19/13	0	0	-	
9/20/13	0	0	-	
9/21/13	0	0	-	
9/22/13	0	0	-	
9/23/13	0	0	-	
9/24/13	0	0	-	
9/25/13	0	0	-	
9/26/13	0	0	-	
9/27/13	0	0	-	
9/28/13	0	0	-	
9/29/13	0	0	-	
9/30/13	0	0	-	
10/1/13	0	0	-	
10/2/13	0	0	-	
10/3/13	0	0	-	
10/4/13	0	0	-	
10/5/13	0	0	-	
10/6/13	0	0	-	
10/7/13	0	0	-	
10/8/13	0	0	-	
10/9/13	0	0	-	
10/10/13	0	0	-	
10/11/13	0	0	-	
10/12/13	0	0	-	
10/13/13	0	0	-	
10/14/13	0	0	-	
10/15/13	0	0	-	
10/16/13	0	0	-	
10/17/13	0	0	-	
10/18/13	0	0	-	
10/19/13	0	0	-	
10/20/13	0	0	-	
10/21/13	0	0	-	
10/22/13	0	0	-	
10/23/13	0	0	-	
10/24/13	0	0	-	
10/25/13	0	0	-	
10/26/13	0	0	-	
10/27/13	0	0	-	
10/28/13	0	0	-	
10/29/13	0	0	-	
10/30/13	0	0	-	
10/31/13	0	0	-	

Merrimack 1

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
11/1/13	0	0	-	
11/2/13	0	0	-	
11/3/13	0	0	-	
11/4/13	0	0	-	
11/5/13	0	0	-	
11/6/13	0	0	-	
11/7/13	0	0	-	
11/8/13	0	0	-	
11/9/13	0	0	-	
11/10/13	0	0	-	
11/11/13	0	0	-	
11/12/13	0	0	-	
11/13/13	0	0	-	
11/14/13	0	0	-	
11/15/13	0	0	-	
11/16/13	0	0	-	
11/17/13	0	0	-	
11/18/13	0	0	-	
11/19/13	0	0	-	
11/20/13	0	0	-	
11/21/13	0	0	-	
11/22/13	12	9,489	39.5	Self-scheduled for load.
11/23/13	24	(5,826)	51.6	Self-scheduled for load.
11/24/13	24	(59,005)	73.5	Self-scheduled for load.
11/25/13	24	(127,316)	99.7	Self-scheduled for load.
11/26/13	24	(35,245)	64.1	Self-scheduled for load.
11/27/13	24	(61,081)	76.4	Self-scheduled for load.
11/28/13	24	(4,009)	48.9	Self-scheduled for load.
11/29/13	24	(36,916)	66.4	Self-scheduled for load.
11/30/13	24	(28,153)	60.9	Self-scheduled for load.
12/1/13	24	(14,717)	56.4	Self-scheduled for load.
12/2/13	24	(27,030)	60.8	Self-scheduled for load.
12/3/13	24	13,224	42.5	Self-scheduled based on market price volatility, reliable op's, & for load.
12/4/13	24	18,377	40.7	Self-scheduled based on market price volatility, reliable op's, & for load.
12/5/13	24	16,297	41.2	Self-scheduled based on market price volatility, reliable op's, & for load.
12/6/13	24	16,344	40.6	Self-scheduled based on market price volatility, reliable op's, & for load.
12/7/13	24	(15,001)	55.6	Self-scheduled for load.
12/8/13	24	(67,370)	78.3	Self-scheduled for load.
12/9/13	24	(77,397)	80.1	Self-scheduled for load.
12/10/13	24	(160,238)	111.8	Self-scheduled for load.
12/11/13	24	(246,045)	145.0	Self-scheduled for ISO-NE capability audit & load.
12/12/13	24	(275,988)	154.2	Self-scheduled for load.
12/13/13	24	(357,302)	185.3	Self-scheduled for load.
12/14/13	24	(365,752)	188.6	Self-scheduled for load.
12/15/13	24	(368,845)	190.4	Self-scheduled for load.
12/16/13	24	(418,053)	211.1	Self-scheduled for load.
12/17/13	24	(361,331)	186.5	Self-scheduled for load.
12/18/13	24	(299,386)	163.1	Self-scheduled for load.
12/19/13	24	(127,059)	100.5	Self-scheduled for load.
12/20/13	24	(76,594)	80.5	Self-scheduled for load.
12/21/13	24	16,020	40.8	Self-scheduled based on market price volatility, reliable op's, & for load.
12/22/13	24	33,063	31.4	Self-scheduled based on market price volatility, reliable op's, & for load.
12/23/13	24	21,027	38.8	Self-scheduled based on market price volatility, reliable op's, & for load.
12/24/13	24	(25,316)	59.2	Self-scheduled for load.
12/25/13	24	(20,047)	57.8	Self-scheduled for load.
12/26/13	24	(37,114)	64.2	Self-scheduled for load.
12/27/13	24	(65,814)	74.3	Self-scheduled for load.
12/28/13	24	(35,162)	63.7	Self-scheduled for load.
12/29/13	24	(35,246)	64.6	Self-scheduled for load.
12/30/13	24	(68,194)	81.0	Self-scheduled for load.
12/31/13	24	(244,484)	171.2	Self-scheduled for load.

Merrimack 2

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
1/1/13	24	(253,988)	91.0	Self-scheduled for load.
1/2/13	24	(352,719)	101.3	Self-scheduled for load.
1/3/13	24	(176,221)	77.5	Self-scheduled for load.
1/4/13	24	(81,757)	65.3	Self-scheduled for load.
1/5/13	24	49,290	46.6	Self-scheduled for reliable operations (high pressure heater) & load.
1/6/13	24	70,961	43.6	Self-scheduled for reliable operations (high pressure heater) & load.
1/7/13	24	43,148	47.6	Self-scheduled for reliable operations (high pressure heater) & load.
1/8/13	24	111,626	37.3	Self-scheduled for reliable operations (high pressure heater) & load.
1/9/13	24	119,564	36.0	Self-scheduled for reliable operations (high pressure heater) & load.
1/10/13	24	137,768	33.1	Self-scheduled for reliable operations (high pressure heater) & load.
1/11/13	24	151,287	31.6	Self-scheduled for reliable operations (high pressure heater) & load.
1/12/13	24	95,857	40.4	Self-scheduled for reliable operations (high pressure heater) & load.
1/13/13	24	128,248	36.0	Self-scheduled for reliable operations (high pressure heater) & load.
1/14/13	24	92,924	40.6	Self-scheduled for reliable operations (high pressure heater) & load.
1/15/13	24	80,068	43.0	Self-scheduled for reliable operations (high pressure heater) & load.
1/16/13	24	(2,723)	54.6	Self-scheduled for load.
1/17/13	24	(75,203)	64.4	Self-scheduled for load.
1/18/13	24	(198,673)	81.0	Self-scheduled for load.
1/19/13	24	(152,832)	74.4	Self-scheduled for load.
1/20/13	24	(143,857)	74.8	Self-scheduled for load.
1/21/13	24	(221,366)	83.5	Self-scheduled for load.
1/22/13	24	(546,462)	125.3	Self-scheduled for load.
1/23/13	24	(918,402)	173.0	Self-scheduled for environmental testing (mercury/PM) & load.
1/24/13	24	(1,154,556)	203.1	Self-scheduled for load.
1/25/13	24	(1,382,932)	232.9	Self-scheduled for environmental testing (RATA) & load.
1/26/13	24	(907,627)	171.8	Self-scheduled for load.
1/27/13	24	(929,043)	174.3	Self-scheduled for load.
1/28/13	24	(844,585)	163.8	Self-scheduled for load.
1/29/13	24	(78,890)	65.1	Self-scheduled for load.
1/30/13	24	95,822	39.9	Self-scheduled for reliable operations (high pressure heater) & load.
1/31/13	24	21,465	50.6	Self-scheduled for reliable operations (high pressure heater) & load.
2/1/13	24	(418,924)	108.3	Self-scheduled for environmental testing (RATA) & load.
2/2/13	24	(918,173)	179.7	Self-scheduled for load.
2/3/13	24	(535,095)	127.3	Self-scheduled for environmental testing (RATA) & load.
2/4/13	24	(911,963)	177.7	Self-scheduled for load.
2/5/13	24	(510,429)	120.4	Self-scheduled for load.
2/6/13	24	(423,067)	109.3	Self-scheduled for load.
2/7/13	24	(830,859)	163.1	Self-scheduled for load.
2/8/13	24	(520,393)	122.8	Self-scheduled for load.
2/9/13	24	(954,721)	179.9	Self-scheduled for load.
2/10/13	24	(1,392,125)	233.6	Self-scheduled for load.
2/11/13	24	(1,274,255)	218.7	Self-scheduled for load.
2/12/13	24	(1,326,534)	226.9	Self-scheduled for load.
2/13/13	24	(930,063)	175.7	Self-scheduled for load.
2/14/13	24	(434,782)	111.2	Self-scheduled for load.
2/15/13	24	(124,416)	70.6	Self-scheduled for load.
2/16/13	24	(280,223)	92.8	Self-scheduled for load.
2/17/13	24	(272,152)	92.4	Self-scheduled for load.
2/18/13	24	(512,333)	121.1	Self-scheduled for load.
2/19/13	24	(444,200)	112.2	Self-scheduled for load.
2/20/13	24	(318,582)	96.7	Self-scheduled for load.
2/21/13	24	(465,882)	114.4	Self-scheduled for load.
2/22/13	24	(126,992)	70.8	Self-scheduled for load.
2/23/13	24	96,908	39.9	Self-scheduled for reliable operations (high pressure heater) & load.
2/24/13	24	100,889	39.4	Self-scheduled for reliable operations (high pressure heater) & load.
2/25/13	24	45,116	47.5	Self-scheduled for reliable operations (high pressure heater) & load.
2/26/13	24	37,738	48.7	Self-scheduled for reliable operations (high pressure heater) & load.
2/27/13	24	46,547	47.8	Self-scheduled for reliable operations (high pressure heater) & load.
2/28/13	24	19,612	51.4	Self-scheduled for reliable operations (high pressure heater) & load.

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Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
3/1/13	24	93,795	40.2	Self-scheduled for reliable operations (high pressure heater) & load.
3/2/13	24	135,199	34.1	Self-scheduled for reliable operations (high pressure heater) & load.
3/3/13	24	119,369	36.8	Self-scheduled for reliable operations (high pressure heater) & load.
3/4/13	24	17,636	51.7	Self-scheduled for reliable operations (high pressure heater) & load.
3/5/13	24	39,707	48.6	Self-scheduled for reliable operations (high pressure heater) & load.
3/6/13	24	21,710	51.3	Self-scheduled for reliable operations (high pressure heater) & load.
3/7/13	24	(22,298)	57.2	Self-scheduled for load.
3/8/13	24	(24,140)	57.4	Self-scheduled for VAR testing & load.
3/9/13	24	59,924	45.7	Self-scheduled based on market price volatility, reliable op's, & for load.
3/10/13	23	68,498	43.9	Self-scheduled based on market price volatility, reliable op's, & for load.
3/11/13	24	57,256	45.9	Self-scheduled based on market price volatility, reliable op's, & for load.
3/12/13	24	87,995	41.3	Self-scheduled based on market price volatility, reliable op's, & for load.
3/13/13	22	90,679	40.8	Self-scheduled based on market price volatility, reliable op's, & for load.
3/14/13	24	(63,139)	63.4	Self-scheduled for load.
3/15/13	24	(17,318)	56.5	Self-scheduled for load.
3/16/13	24	26,607	50.4	Self-scheduled based on market price volatility, reliable op's, & for load.
3/17/13	24	45,705	47.8	Self-scheduled based on market price volatility, reliable op's, & for load.
3/18/13	24	7,302	53.2	Self-scheduled based on market price volatility, reliable op's, & for load.
3/19/13	24	24,547	50.8	Self-scheduled based on market price volatility, reliable op's, & for load.
3/20/13	24	(94,956)	68.5	Self-scheduled for load.
3/21/13	1	(31)	66.6	Self-scheduled for load.
3/22/13	0	0	-	
3/23/13	0	0	-	
3/24/13	8	(1,706)	55.4	Self-scheduled for reliable operations (test repairs) & load.
3/25/13	24	(26,261)	58.0	Self-scheduled for reliable operations (test repairs) & load.
3/26/13	24	(8,486)	55.5	Self-scheduled for reliable operations (test repairs) & load.
3/27/13	24	98,384	39.6	Self-scheduled for reliable operations (test repairs) & load.
3/28/13	24	99,054	39.4	Self-scheduled for reliable operations (test repairs) & load.
3/29/13	22	47,079	46.8	Self-scheduled for reliable operations (test repairs) & load.
3/30/13	0	0	-	
3/31/13	0	0	-	
4/1/13	0	0	-	
4/2/13	0	0	-	
4/3/13	0	0	-	
4/4/13	0	0	-	
4/5/13	0	0	-	
4/6/13	0	0	-	
4/7/13	0	0	-	
4/8/13	0	0	-	
4/9/13	0	0	-	
4/10/13	0	0	-	
4/11/13	0	0	-	
4/12/13	0	0	-	
4/13/13	0	0	-	
4/14/13	0	0	-	
4/15/13	0	0	-	
4/16/13	0	0	-	
4/17/13	0	0	-	
4/18/13	0	0	-	
4/19/13	0	0	-	
4/20/13	0	0	-	
4/21/13	0	0	-	
4/22/13	0	0	-	
4/23/13	0	0	-	
4/24/13	0	0	-	
4/25/13	0	0	-	
4/26/13	0	0	-	
4/27/13	0	0	-	
4/28/13	0	0	-	
4/29/13	0	0	-	
4/30/13	0	0	-	

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Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
5/1/13	0	0	-	
5/2/13	0	0	-	
5/3/13	0	0	-	
5/4/13	0	0	-	
5/5/13	0	0	-	
5/6/13	0	0	-	
5/7/13	0	0	-	
5/8/13	0	0	-	
5/9/13	0	0	-	
5/10/13	0	0	-	
5/11/13	0	0	-	
5/12/13	0	0	-	
5/13/13	0	0	-	
5/14/13	0	0	-	
5/15/13	0	0	-	
5/16/13	0	0	-	
5/17/13	0	0	-	
5/18/13	0	0	-	
5/19/13	0	0	-	
5/20/13	0	0	-	
5/21/13	0	0	-	
5/22/13	0	0	-	
5/23/13	0	0	-	
5/24/13	0	0	-	
5/25/13	0	0	-	
5/26/13	0	0	-	
5/27/13	0	0	-	
5/28/13	0	0	-	
5/29/13	0	0	-	
5/30/13	3	460	46.7	Self-scheduled for reliable operations (post-maint. testing) & load.
5/31/13	20	(39,584)	60.0	Self-scheduled for reliable operations (post-maint. testing) & load.
6/1/13	24	57,304	46.0	Self-scheduled for reliable operations (post-maint. testing) & load.
6/2/13	24	76,532	43.1	Self-scheduled for reliable operations (post-maint. testing) & load.
6/3/13	24	81,254	40.4	Self-scheduled for reliable operations (post-maint. testing) & load.
6/4/13	21	137,431	30.7	Self-scheduled for reliable operations (post-maint. testing) & load.
6/5/13	20	146,693	28.2	Self-scheduled for reliable operations (post-maint. testing) & load.
6/6/13	1	28	38.7	Self-scheduled for reliable operations (post-maint. testing) & load.
6/7/13	0	0	-	
6/8/13	0	0	-	
6/9/13	0	0	-	
6/10/13	0	0	-	
6/11/13	0	0	-	
6/12/13	0	0	-	
6/13/13	0	0	-	
6/14/13	0	0	-	
6/15/13	0	0	-	
6/16/13	0	0	-	
6/17/13	0	0	-	
6/18/13	0	0	-	
6/19/13	0	0	-	
6/20/13	0	0	-	
6/21/13	0	0	-	
6/22/13	0	0	-	
6/23/13	0	0	-	
6/24/13	8	(101,775)	43.7	Dispatched by ISO-NE for load.
6/25/13	24	(63,249)	63.8	Self-scheduled for load.
6/26/13	24	(12,084)	56.4	Self-scheduled for load.
6/27/13	0	0	-	
6/28/13	0	0	-	
6/29/13	0	0	-	
6/30/13	0	0	-	

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Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
7/1/13	0	0	-	
7/2/13	0	0	-	
7/3/13	0	0	-	
7/4/13	0	0	-	
7/5/13	19	(66,435)	59.0	Dispatched by ISO-NE for load.
7/6/13	24	(79,508)	65.7	Self-scheduled for load.
7/7/13	24	(84,292)	66.6	Self-scheduled for load.
7/8/13	24	(23,322)	57.5	Self-scheduled for ISO-NE capability audit & load.
7/9/13	24	37,301	47.9	Self-scheduled based on market price volatility, reliable op's, & for load.
7/10/13	24	39,754	48.2	Self-scheduled based on market price volatility, reliable op's, & for load.
7/11/13	24	58,588	44.6	Self-scheduled based on market price volatility, reliable op's, & for load.
7/12/13	24	110,559	35.0	Self-scheduled based on market price volatility, reliable op's, & for load.
7/13/13	24	103,316	35.6	Self-scheduled based on market price volatility, reliable op's, & for load.
7/14/13	24	93,647	40.5	Self-scheduled based on market price volatility, reliable op's, & for load.
7/15/13	24	(58,202)	62.7	Self-scheduled for VAR testing & load.
7/16/13	24	(284,751)	93.6	Self-scheduled for environmental testing (RATA/mercury/PM) & load.
7/17/13	24	(338,816)	102.8	Self-scheduled for load.
7/18/13	24	(349,458)	101.9	Self-scheduled for load.
7/19/13	24	(414,512)	111.8	Self-scheduled for load.
7/20/13	24	(7,862)	55.3	Self-scheduled for load.
7/21/13	24	74,485	41.8	Self-scheduled for environmental testing (RATA) & load.
7/22/13	24	42,216	47.8	Self-scheduled for load.
7/23/13	22	56,981	43.7	Self-scheduled for load.
7/24/13	0	0	-	
7/25/13	0	0	-	
7/26/13	0	0	-	
7/27/13	0	0	-	
7/28/13	0	0	-	
7/29/13	0	0	-	
7/30/13	0	0	-	
7/31/13	0	0	-	
8/1/13	0	0	-	
8/2/13	0	0	-	
8/3/13	0	0	-	
8/4/13	0	0	-	
8/5/13	10	5,096	22.7	Self-scheduled for Clean Air Project testing & load.
8/6/13	24	102,629	27.3	Self-scheduled for Clean Air Project testing & load.
8/7/13	24	158,146	29.5	Self-scheduled for Clean Air Project testing & load.
8/8/13	24	107,106	38.9	Self-scheduled for Clean Air Project testing & load.
8/9/13	3	16,898	(0.3)	Self-scheduled for Clean Air Project testing & load.
8/10/13	0	0	-	
8/11/13	0	0	-	
8/12/13	0	0	-	
8/13/13	0	0	-	
8/14/13	0	0	-	
8/15/13	0	0	-	
8/16/13	0	0	-	
8/17/13	0	0	-	
8/18/13	0	0	-	
8/19/13	0	0	-	
8/20/13	0	0	-	
8/21/13	0	0	-	
8/22/13	0	0	-	
8/23/13	0	0	-	
8/24/13	0	0	-	
8/25/13	0	0	-	
8/26/13	0	0	-	
8/27/13	0	0	-	
8/28/13	0	0	-	
8/29/13	0	0	-	
8/30/13	0	0	-	
8/31/13	0	0	-	

Merrimack 2

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
9/1/13	0	0	-	
9/2/13	0	0	-	
9/3/13	0	0	-	
9/4/13	0	0	-	
9/5/13	0	0	-	
9/6/13	0	0	-	
9/7/13	0	0	-	
9/8/13	0	0	-	
9/9/13	0	0	-	
9/10/13	0	0	-	
9/11/13	14	22,327	47.4	Dispatched by ISO-NE for load.
9/12/13	22	48,996	45.3	Self-scheduled for reliable operations & load.
9/13/13	0	0	-	
9/14/13	0	0	-	
9/15/13	0	0	-	
9/16/13	0	0	-	
9/17/13	0	0	-	
9/18/13	0	0	-	
9/19/13	0	0	-	
9/20/13	0	0	-	
9/21/13	0	0	-	
9/22/13	0	0	-	
9/23/13	0	0	-	
9/24/13	0	0	-	
9/25/13	0	0	-	
9/26/13	0	0	-	
9/27/13	0	0	-	
9/28/13	0	0	-	
9/29/13	0	0	-	
9/30/13	0	0	-	
10/1/13	0	0	-	
10/2/13	0	0	-	
10/3/13	0	0	-	
10/4/13	0	0	-	
10/5/13	0	0	-	
10/6/13	0	0	-	
10/7/13	0	0	-	
10/8/13	0	0	-	
10/9/13	0	0	-	
10/10/13	0	0	-	
10/11/13	0	0	-	
10/12/13	0	0	-	
10/13/13	0	0	-	
10/14/13	0	0	-	
10/15/13	0	0	-	
10/16/13	0	0	-	
10/17/13	0	0	-	
10/18/13	0	0	-	
10/19/13	0	0	-	
10/20/13	0	0	-	
10/21/13	0	0	-	
10/22/13	0	0	-	
10/23/13	0	0	-	
10/24/13	0	0	-	
10/25/13	0	0	-	
10/26/13	0	0	-	
10/27/13	0	0	-	
10/28/13	0	0	-	
10/29/13	0	0	-	
10/30/13	0	0	-	
10/31/13	0	0	-	

Merrimack 2

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
11/1/13	0	0	-	
11/2/13	0	0	-	
11/3/13	0	0	-	
11/4/13	0	0	-	
11/5/13	0	0	-	
11/6/13	0	0	-	
11/7/13	0	0	-	
11/8/13	0	0	-	
11/9/13	0	0	-	
11/10/13	0	0	-	
11/11/13	0	0	-	
11/12/13	0	0	-	
11/13/13	0	0	-	
11/14/13	0	0	-	
11/15/13	0	0	-	
11/16/13	0	0	-	
11/17/13	0	0	-	
11/18/13	0	0	-	
11/19/13	0	0	-	
11/20/13	0	0	-	
11/21/13	0	0	-	
11/22/13	0	0	-	
11/23/13	0	0	-	
11/24/13	0	0	-	
11/25/13	0	0	-	
11/26/13	0	0	-	
11/27/13	0	0	-	
11/28/13	0	0	-	
11/29/13	0	0	-	
11/30/13	0	0	-	
12/1/13	0	0	-	
12/2/13	0	0	-	
12/3/13	0	0	-	
12/4/13	0	0	-	
12/5/13	0	0	-	
12/6/13	0	0	-	
12/7/13	11	10,050	49.7	Self-scheduled for load.
12/8/13	24	21,641	50.8	Self-scheduled for load.
12/9/13	24	(243,761)	87.9	Self-scheduled for load.
12/10/13	24	(437,846)	113.2	Self-scheduled for load.
12/11/13	24	(690,064)	147.5	Self-scheduled for load.
12/12/13	24	(769,181)	153.3	Self-scheduled for load.
12/13/13	24	(1,016,461)	185.1	Self-scheduled for load.
12/14/13	24	(1,038,254)	187.8	Self-scheduled for load.
12/15/13	24	(1,043,578)	191.3	Self-scheduled for load.
12/16/13	24	(1,202,932)	214.6	Self-scheduled for load.
12/17/13	24	(1,026,184)	186.4	Self-scheduled for load.
12/18/13	24	(844,393)	163.1	Self-scheduled for load.
12/19/13	24	(336,805)	99.8	Self-scheduled for load.
12/20/13	24	(190,262)	81.1	Self-scheduled for load.
12/21/13	24	75,159	40.9	Self-scheduled based on market price volatility, reliable op's, & for load.
12/22/13	24	124,665	31.7	Self-scheduled based on market price volatility, reliable op's, & for load.
12/23/13	24	90,010	38.4	Self-scheduled based on market price volatility, reliable op's, & for load.
12/24/13	24	(44,782)	61.0	Self-scheduled for load.
12/25/13	24	(25,270)	58.1	Self-scheduled for load.
12/26/13	24	(69,098)	63.9	Self-scheduled for load.
12/27/13	24	(168,520)	76.5	Self-scheduled for load.
12/28/13	24	(75,457)	65.3	Self-scheduled for load.
12/29/13	1	97,660	(1,214.5)	Self-scheduled for load.
12/30/13	0	0	-	
12/31/13	6	(883)	55.6	Self-scheduled for load.

Newington

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
1/1/13	0	0	-	
1/2/13	0	0	-	
1/3/13	4	(247,343)	60.4	Dispatched by ISO-NE for reliability & load.
1/4/13	2	(281,517)	61.3	Dispatched by ISO-NE for reliability & load.
1/5/13	0	0	-	
1/6/13	0	0	-	
1/7/13	0	0	-	
1/8/13	0	0	-	
1/9/13	0	0	-	
1/10/13	0	0	-	
1/11/13	0	0	-	
1/12/13	0	0	-	
1/13/13	0	0	-	
1/14/13	0	0	-	
1/15/13	0	0	-	
1/16/13	0	0	-	
1/17/13	0	0	-	
1/18/13	0	0	-	
1/19/13	0	0	-	
1/20/13	0	0	-	
1/21/13	0	0	-	
1/22/13	0	0	-	
1/23/13	4	(448,072)	204.1	Dispatched by ISO-NE for reliability & load.
1/24/13	4	(785,761)	212.4	Self-scheduled based on market price volatility, reliable op's, & for load.
1/25/13	3	(492,629)	276.9	Self-scheduled based on market price volatility, reliable op's, & for load.
1/26/13	0	0	-	
1/27/13	0	0	-	
1/28/13	0	0	-	
1/29/13	5	(30,003)	75.8	Dispatched by ISO-NE for reliability & load.
1/30/13	0	0	-	
1/31/13	0	0	-	
2/1/13	0	0	-	
2/2/13	0	0	-	
2/3/13	0	0	-	
2/4/13	0	(215,155)	142.6	Dispatched by ISO-NE for reliability & load.
2/5/13	0	0	-	
2/6/13	0	0	-	
2/7/13	1	(331,739)	140.8	Dispatched by ISO-NE for reliability & load.
2/8/13	0	0	-	
2/9/13	1	(578,144)	142.5	Dispatched by ISO-NE for reliability & load.
2/10/13	0	(895,196)	228.9	Dispatched by ISO-NE for reliability & load.
2/11/13	1	(579,091)	208.5	Dispatched by ISO-NE for reliability & load.
2/12/13	0	(393,350)	172.1	Dispatched by ISO-NE for reliability & load.
2/13/13	0	0	-	
2/14/13	0	0	-	
2/15/13	0	0	-	
2/16/13	0	0	-	
2/17/13	3	(84,552)	127.8	Dispatched by ISO-NE for reliability & load.
2/18/13	3	(102,647)	121.3	Dispatched by ISO-NE for reliability & load.
2/19/13	0	0	-	
2/20/13	0	0	-	
2/21/13	0	0	-	
2/22/13	0	0	-	
2/23/13	0	0	-	
2/24/13	0	0	-	
2/25/13	0	0	-	
2/26/13	0	0	-	
2/27/13	0	0	-	
2/28/13	0	0	-	

Newington

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
3/1/13	0	0	-	
3/2/13	0	0	-	
3/3/13	0	0	-	
3/4/13	0	0	-	
3/5/13	0	0	-	
3/6/13	0	0	-	
3/7/13	0	0	-	
3/8/13	0	0	-	
3/9/13	0	0	-	
3/10/13	0	0	-	
3/11/13	0	0	-	
3/12/13	0	0	-	
3/13/13	0	0	-	
3/14/13	0	0	-	
3/15/13	0	0	-	
3/16/13	0	0	-	
3/17/13	0	0	-	
3/18/13	0	0	-	
3/19/13	0	0	-	
3/20/13	0	0	-	
3/21/13	4	174,061	100.2	Self-scheduled for load.
3/22/13	1	3,639	59.0	Self-scheduled for load.
3/23/13	0	0	-	
3/24/13	0	0	-	
3/25/13	0	(25,320)	88.9	Dispatched by ISO-NE for reliability & load.
3/26/13	0	0	-	
3/27/13	0	0	-	
3/28/13	0	0	-	
3/29/13	0	0	-	
3/30/13	0	0	-	
3/31/13	0	0	-	
4/1/13	0	0	-	
4/2/13	0	0	-	
4/3/13	0	0	-	
4/4/13	0	0	-	
4/5/13	0	0	-	
4/6/13	0	0	-	
4/7/13	0	0	-	
4/8/13	0	0	-	
4/9/13	0	0	-	
4/10/13	0	0	-	
4/11/13	0	0	-	
4/12/13	0	0	-	
4/13/13	0	0	-	
4/14/13	0	0	-	
4/15/13	0	0	-	
4/16/13	0	0	-	
4/17/13	0	0	-	
4/18/13	0	0	-	
4/19/13	0	0	-	
4/20/13	0	0	-	
4/21/13	0	0	-	
4/22/13	0	0	-	
4/23/13	0	0	-	
4/24/13	0	0	-	
4/25/13	0	0	-	
4/26/13	0	0	-	
4/27/13	0	0	-	
4/28/13	0	0	-	
4/29/13	0	0	-	
4/30/13	0	0	-	

Newington

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
5/1/13	0	0	-	
5/2/13	0	0	-	
5/3/13	0	0	-	
5/4/13	0	0	-	
5/5/13	0	0	-	
5/6/13	0	0	-	
5/7/13	0	0	-	
5/8/13	0	0	-	
5/9/13	0	0	-	
5/10/13	0	0	-	
5/11/13	0	0	-	
5/12/13	0	0	-	
5/13/13	0	0	-	
5/14/13	0	0	-	
5/15/13	0	0	-	
5/16/13	0	0	-	
5/17/13	0	0	-	
5/18/13	0	0	-	
5/19/13	0	0	-	
5/20/13	0	0	-	
5/21/13	0	0	-	
5/22/13	0	0	-	
5/23/13	0	0	-	
5/24/13	0	0	-	
5/25/13	0	0	-	
5/26/13	0	0	-	
5/27/13	0	0	-	
5/28/13	0	0	-	
5/29/13	0	0	-	
5/30/13	0	0	-	
5/31/13	0	(28,451)	77.0	Dispatched by ISO-NE for reliability & load.
6/1/13	6	(3,743)	58.1	Dispatched by ISO-NE for reliability & load.
6/2/13	0	0	-	
6/3/13	0	0	-	
6/4/13	0	0	-	
6/5/13	0	0	-	
6/6/13	0	0	-	
6/7/13	0	0	-	
6/8/13	0	0	-	
6/9/13	0	0	-	
6/10/13	0	0	-	
6/11/13	0	0	-	
6/12/13	0	0	-	
6/13/13	0	0	-	
6/14/13	0	0	-	
6/15/13	0	0	-	
6/16/13	0	0	-	
6/17/13	0	0	-	
6/18/13	0	0	-	
6/19/13	0	0	-	
6/20/13	0	0	-	
6/21/13	0	0	-	
6/22/13	0	0	-	
6/23/13	0	0	-	
6/24/13	0	0	-	
6/25/13	12	8,234	57.2	Dispatched by ISO-NE for reliability & load.
6/26/13	0	0	-	
6/27/13	0	0	-	
6/28/13	0	0	-	
6/29/13	0	0	-	
6/30/13	0	0	-	

Newington

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
7/1/13	0	0	-	
7/2/13	0	0	-	
7/3/13	0	0	-	
7/4/13	0	0	-	
7/5/13	1	(48,173)	124.8	Dispatched by ISO-NE for reliability & load.
7/6/13	0	0	-	
7/7/13	0	0	-	
7/8/13	0	0	-	
7/9/13	0	0	-	
7/10/13	0	0	-	
7/11/13	0	0	-	
7/12/13	0	0	-	
7/13/13	0	0	-	
7/14/13	0	0	-	
7/15/13	9	40,901	188.9	Dispatched by ISO-NE for reliability & load.
7/16/13	12	(46,094)	104.3	Dispatched by ISO-NE for reliability & load.
7/17/13	13	(146,497)	87.8	Dispatched by ISO-NE for reliability & load.
7/18/13	13	(181,292)	172.4	Dispatched by ISO-NE for reliability & load.
7/19/13	13	(235,636)	160.5	Dispatched by ISO-NE for reliability & load.
7/20/13	15	(88,926)	77.8	Dispatched by ISO-NE for reliability & load.
7/21/13	0	0	-	
7/22/13	0	0	-	
7/23/13	11	(28,685)	61.5	Dispatched by ISO-NE for reliability & load.
7/24/13	0	0	-	
7/25/13	0	0	-	
7/26/13	0	0	-	
7/27/13	0	0	-	
7/28/13	0	0	-	
7/29/13	0	0	-	
7/30/13	0	0	-	
7/31/13	0	0	-	
8/1/13	0	0	-	
8/2/13	0	0	-	
8/3/13	0	0	-	
8/4/13	0	0	-	
8/5/13	0	0	-	
8/6/13	0	0	-	
8/7/13	0	0	-	
8/8/13	0	0	-	
8/9/13	0	0	-	
8/10/13	12	(31,678)	34.6	Dispatched by ISO-NE for reliability & load.
8/11/13	0	0	-	
8/12/13	0	0	-	
8/13/13	0	0	-	
8/14/13	0	0	-	
8/15/13	0	0	-	
8/16/13	0	0	-	
8/17/13	0	0	-	
8/18/13	0	0	-	
8/19/13	0	0	-	
8/20/13	0	0	-	
8/21/13	17	368,270	47.8	Self-scheduled for ISO-NE capability audit, VAR testing, & load.
8/22/13	13	(18,408)	38.9	Dispatched by ISO-NE for reliability & load.
8/23/13	0	0	-	
8/24/13	0	0	-	
8/25/13	0	0	-	
8/26/13	0	0	-	
8/27/13	10	(40,678)	71.4	Dispatched by ISO-NE for reliability & load.
8/28/13	0	0	-	
8/29/13	0	0	-	
8/30/13	0	0	-	
8/31/13	0	0	-	

Newington

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
9/1/13	0	0	-	
9/2/13	0	0	-	
9/3/13	0	0	-	
9/4/13	0	0	-	
9/5/13	0	0	-	
9/6/13	0	0	-	
9/7/13	0	0	-	
9/8/13	0	0	-	
9/9/13	0	0	-	
9/10/13	0	0	-	
9/11/13	0	0	-	
9/12/13	0	(31,569)	55.0	Dispatched by ISO-NE for reliability & load.
9/13/13	0	0	-	
9/14/13	0	0	-	
9/15/13	0	0	-	
9/16/13	0	0	-	
9/17/13	0	0	-	
9/18/13	0	0	-	
9/19/13	0	0	-	
9/20/13	0	0	-	
9/21/13	0	0	-	
9/22/13	0	0	-	
9/23/13	0	0	-	
9/24/13	0	0	-	
9/25/13	0	0	-	
9/26/13	0	0	-	
9/27/13	0	0	-	
9/28/13	0	0	-	
9/29/13	0	0	-	
9/30/13	0	0	-	
10/1/13	0	0	-	
10/2/13	0	0	-	
10/3/13	0	0	-	
10/4/13	0	0	-	
10/5/13	0	0	-	
10/6/13	0	0	-	
10/7/13	0	0	-	
10/8/13	0	0	-	
10/9/13	0	0	-	
10/10/13	0	0	-	
10/11/13	0	0	-	
10/12/13	0	0	-	
10/13/13	0	0	-	
10/14/13	0	0	-	
10/15/13	0	0	-	
10/16/13	0	0	-	
10/17/13	0	0	-	
10/18/13	0	0	-	
10/19/13	0	0	-	
10/20/13	0	0	-	
10/21/13	0	0	-	
10/22/13	0	0	-	
10/23/13	0	0	-	
10/24/13	0	0	-	
10/25/13	0	0	-	
10/26/13	0	0	-	
10/27/13	0	0	-	
10/28/13	0	0	-	
10/29/13	0	0	-	
10/30/13	0	0	-	
10/31/13	0	0	-	

Newington

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
11/1/13	0	0	-	
11/2/13	0	0	-	
11/3/13	0	0	-	
11/4/13	0	0	-	
11/5/13	0	0	-	
11/6/13	0	0	-	
11/7/13	0	0	-	
11/8/13	0	0	-	
11/9/13	0	0	-	
11/10/13	0	0	-	
11/11/13	0	0	-	
11/12/13	0	0	-	
11/13/13	0	0	-	
11/14/13	9	61,469	30.9	Self-scheduled for Winter Reliability Program & load.
11/15/13	0	0	-	
11/16/13	0	0	-	
11/17/13	0	0	-	
11/18/13	0	0	-	
11/19/13	0	0	-	
11/20/13	0	0	-	
11/21/13	0	0	-	
11/22/13	0	0	-	
11/23/13	0	0	-	
11/24/13	0	0	-	
11/25/13	0	0	-	
11/26/13	0	0	-	
11/27/13	0	0	-	
11/28/13	0	0	-	
11/29/13	0	0	-	
11/30/13	0	0	-	
12/1/13	0	0	-	
12/2/13	0	0	-	
12/3/13	0	0	-	
12/4/13	0	0	-	
12/5/13	0	0	-	
12/6/13	0	0	-	
12/7/13	0	0	-	
12/8/13	0	0	-	
12/9/13	0	0	-	
12/10/13	0	0	-	
12/11/13	0	0	-	
12/12/13	0	0	-	
12/13/13	0	0	-	
12/14/13	0	0	-	
12/15/13	6	(79,541)	185.1	Dispatched by ISO-NE for reliability & load.
12/16/13	4	(139,566)	201.3	Dispatched by ISO-NE for reliability & load.
12/17/13	6	(39,473)	184.3	Dispatched by ISO-NE for reliability & load.
12/18/13	3	(30,173)	155.9	Dispatched by ISO-NE for reliability & load.
12/19/13	0	3,735	106.3	Dispatched by ISO-NE for reliability & load.
12/20/13	0	0	-	
12/21/13	0	0	-	
12/22/13	0	0	-	
12/23/13	0	0	-	
12/24/13	0	0	-	
12/25/13	0	0	-	
12/26/13	0	0	-	
12/27/13	0	0	-	
12/28/13	0	0	-	
12/29/13	0	0	-	
12/30/13	0	0	-	
12/31/13	0	0	-	

Schiller 4

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
1/1/13	7	(36,216)	96.5	Self-scheduled for load.
1/2/13	6	(47,468)	106.5	Self-scheduled for load.
1/3/13	7	(22,407)	79.5	Self-scheduled for load.
1/4/13	5	(8,673)	66.5	Self-scheduled for load.
1/5/13	0	34	43.7	Self-scheduled for load.
1/6/13	0	0	-	
1/7/13	0	0	-	
1/8/13	0	0	-	
1/9/13	0	0	-	
1/10/13	0	0	-	
1/11/13	0	0	-	
1/12/13	10	(10,766)	48.5	Dispatched by ISO-NE for load.
1/13/13	0	0	-	
1/14/13	7	(6,454)	37.3	Dispatched by ISO-NE for load.
1/15/13	0	0	-	
1/16/13	1	(16,010)	94.2	Dispatched by ISO-NE for load.
1/17/13	0	0	-	
1/18/13	5	(26,957)	99.7	Dispatched by ISO-NE for load.
1/19/13	0	(21,080)	79.5	Dispatched by ISO-NE for load.
1/20/13	3	(19,982)	84.3	Dispatched by ISO-NE for load.
1/21/13	3	(29,432)	87.9	Dispatched by ISO-NE for load.
1/22/13	4	(72,642)	129.5	Self-scheduled for load.
1/23/13	6	(124,879)	176.9	Self-scheduled for load.
1/24/13	10	(157,362)	205.3	Self-scheduled for load.
1/25/13	6	(188,751)	235.9	Dispatched by ISO-NE for load.
1/26/13	4	(106,252)	181.0	Self-scheduled for load.
1/27/13	12	(124,861)	176.7	Self-scheduled for load.
1/28/13	12	(108,812)	169.3	Self-scheduled for load.
1/29/13	7	(9,379)	70.5	Dispatched by ISO-NE for load.
1/30/13	0	166	43.8	Dispatched by ISO-NE for load.
1/31/13	0	0	-	
2/1/13	0	(62,146)	140.7	Dispatched by ISO-NE for load.
2/2/13	0	(129,273)	198.0	Dispatched by ISO-NE for load.
2/3/13	2	(75,531)	137.2	Dispatched by ISO-NE for load.
2/4/13	3	(129,218)	197.5	Dispatched by ISO-NE for load.
2/5/13	3	(69,900)	124.7	Dispatched by ISO-NE for load.
2/6/13	1	(58,226)	114.7	Dispatched by ISO-NE for load.
2/7/13	3	(115,611)	174.3	Dispatched by ISO-NE for load.
2/8/13	5	(73,812)	130.0	Dispatched by ISO-NE for load.
2/9/13	3	(131,872)	189.2	Dispatched by ISO-NE for load.
2/10/13	3	(195,710)	237.7	Dispatched by ISO-NE for load.
2/11/13	3	(178,430)	221.7	Dispatched by ISO-NE for load.
2/12/13	0	(181,545)	229.7	Dispatched by ISO-NE for load.
2/13/13	1	(131,627)	182.5	Dispatched by ISO-NE for load.
2/14/13	0	(58,205)	116.1	Dispatched by ISO-NE for load.
2/15/13	0	(15,265)	73.5	Dispatched by ISO-NE for load.
2/16/13	0	(36,539)	100.5	Dispatched by ISO-NE for load.
2/17/13	8	(41,202)	100.2	Dispatched by ISO-NE for load.
2/18/13	4	(68,271)	125.6	Dispatched by ISO-NE for load.
2/19/13	3	(59,580)	117.3	Dispatched by ISO-NE for load.
2/20/13	0	(2,282)	86.1	Dispatched by ISO-NE for load.
2/21/13	0	0	-	
2/22/13	0	0	-	
2/23/13	0	0	-	
2/24/13	0	0	-	
2/25/13	0	0	-	
2/26/13	0	0	-	
2/27/13	0	0	-	
2/28/13	0	0	-	

Schiller 4

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
3/1/13	0	0	-	
3/2/13	0	0	-	
3/3/13	0	0	-	
3/4/13	0	(9,870)	56.1	Dispatched by ISO-NE for load.
3/5/13	0	0	-	
3/6/13	0	(6,064)	70.8	Dispatched by ISO-NE for load.
3/7/13	1	(8,345)	63.4	Dispatched by ISO-NE for load.
3/8/13	0	(6,480)	61.3	Dispatched by ISO-NE for load.
3/9/13	0	(736)	53.3	Dispatched by ISO-NE for load.
3/10/13	0	0	-	
3/11/13	0	0	-	
3/12/13	0	0	-	
3/13/13	0	0	-	
3/14/13	0	(13,393)	77.1	Dispatched by ISO-NE for load.
3/15/13	0	(4,898)	58.7	Dispatched by ISO-NE for load.
3/16/13	0	30	48.2	Dispatched by ISO-NE for load.
3/17/13	0	0	-	
3/18/13	0	(12,274)	75.1	Dispatched by ISO-NE for load.
3/19/13	1	(17,446)	75.5	Dispatched by ISO-NE for load.
3/20/13	1	(18,541)	77.0	Dispatched by ISO-NE for load.
3/21/13	24	(32,063)	92.7	Dispatched by ISO-NE for load.
3/22/13	24	(5,937)	63.7	Dispatched by ISO-NE for load.
3/23/13	1	79	43.4	Dispatched by ISO-NE for load.
3/24/13	0	0	-	
3/25/13	0	(8,794)	69.2	Dispatched by ISO-NE for load.
3/26/13	0	0	-	
3/27/13	0	0	-	
3/28/13	0	0	-	
3/29/13	0	0	-	
3/30/13	0	0	-	
3/31/13	0	0	-	
4/1/13	0	0	-	
4/2/13	17	(11,151)	51.4	Dispatched by ISO-NE for load.
4/3/13	0	0	-	
4/4/13	0	0	-	
4/5/13	0	0	-	
4/6/13	0	0	-	
4/7/13	0	0	-	
4/8/13	0	0	-	
4/9/13	0	0	-	
4/10/13	0	0	-	
4/11/13	0	0	-	
4/12/13	0	0	-	
4/13/13	0	0	-	
4/14/13	15	(10,288)	45.4	Dispatched by ISO-NE for load.
4/15/13	0	0	-	
4/16/13	14	(6,452)	44.7	Dispatched by ISO-NE for load.
4/17/13	0	0	-	
4/18/13	0	0	-	
4/19/13	0	0	-	
4/20/13	14	(11,298)	47.3	Dispatched by ISO-NE for load.
4/21/13	0	0	-	
4/22/13	9	(6,728)	40.4	Dispatched by ISO-NE for load.
4/23/13	24	(8,777)	54.4	Dispatched by ISO-NE for load.
4/24/13	24	(7,665)	44.8	Dispatched by ISO-NE for load.
4/25/13	1	67	47.1	Dispatched by ISO-NE for load.
4/26/13	16	(8,902)	43.1	Dispatched by ISO-NE for load.
4/27/13	0	0	-	
4/28/13	11	(6,384)	55.4	Dispatched by ISO-NE for load.
4/29/13	16	(7,003)	60.9	Dispatched by ISO-NE for load.
4/30/13	18	(7,429)	51.2	Dispatched by ISO-NE for load.

Schiller 4

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
5/1/13	24	(11,051)	50.8	Dispatched by ISO-NE for load.
5/2/13	24	(9,525)	43.9	Dispatched by ISO-NE for load.
5/3/13	24	(7,457)	36.5	Dispatched by ISO-NE for load.
5/4/13	0	0	-	
5/5/13	0	0	-	
5/6/13	0	0	-	
5/7/13	0	0	-	
5/8/13	0	0	-	
5/9/13	0	0	-	
5/10/13	0	0	-	
5/11/13	0	0	-	
5/12/13	0	0	-	
5/13/13	0	0	-	
5/14/13	0	0	-	
5/15/13	0	0	-	
5/16/13	18	7,449	43.4	Self-scheduled for mercury testing & load.
5/17/13	0	0	-	
5/18/13	0	0	-	
5/19/13	0	0	-	
5/20/13	0	0	-	
5/21/13	0	0	-	
5/22/13	0	0	-	
5/23/13	0	0	-	
5/24/13	0	0	-	
5/25/13	0	0	-	
5/26/13	0	0	-	
5/27/13	0	0	-	
5/28/13	0	0	-	
5/29/13	0	0	-	
5/30/13	0	0	-	
5/31/13	0	(10,553)	80.9	Dispatched by ISO-NE for load.
6/1/13	10	(8,397)	65.3	Dispatched by ISO-NE for load.
6/2/13	10	(7,756)	64.5	Dispatched by ISO-NE for load.
6/3/13	0	0	-	
6/4/13	0	0	-	
6/5/13	0	0	-	
6/6/13	0	0	-	
6/7/13	0	0	-	
6/8/13	0	0	-	
6/9/13	0	0	-	
6/10/13	0	0	-	
6/11/13	0	0	-	
6/12/13	0	0	-	
6/13/13	0	0	-	
6/14/13	0	0	-	
6/15/13	0	0	-	
6/16/13	0	0	-	
6/17/13	0	0	-	
6/18/13	0	0	-	
6/19/13	0	0	-	
6/20/13	0	0	-	
6/21/13	0	0	-	
6/22/13	0	0	-	
6/23/13	0	0	-	
6/24/13	16	(40,003)	135.4	Dispatched by ISO-NE for load.
6/25/13	15	(12,206)	83.0	Dispatched by ISO-NE for load.
6/26/13	14	(9,244)	74.3	Dispatched by ISO-NE for load.
6/27/13	0	0	-	
6/28/13	0	0	-	
6/29/13	0	0	-	
6/30/13	0	0	-	

Schiller 4

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
7/1/13	0	0	-	
7/2/13	0	0	-	
7/3/13	0	0	-	
7/4/13	12	(10,685)	78.1	Dispatched by ISO-NE for load.
7/5/13	13	(7,359)	68.7	Dispatched by ISO-NE for load.
7/6/13	14	(12,755)	86.6	Dispatched by ISO-NE for load.
7/7/13	14	(12,370)	88.2	Dispatched by ISO-NE for load.
7/8/13	12	(2,955)	67.4	Dispatched by ISO-NE for load.
7/9/13	0	0	-	
7/10/13	5	(7,105)	57.3	Dispatched by ISO-NE for load.
7/11/13	0	0	-	
7/12/13	0	0	-	
7/13/13	0	0	-	
7/14/13	0	0	-	
7/15/13	14	(17,412)	87.0	Dispatched by ISO-NE for load & ISO-NE capability audit.
7/16/13	14	(38,038)	114.7	Dispatched by ISO-NE for load.
7/17/13	16	(46,637)	124.0	Dispatched by ISO-NE for load.
7/18/13	14	(41,714)	104.4	Dispatched by ISO-NE for load.
7/19/13	15	(52,967)	138.8	Dispatched by ISO-NE for load.
7/20/13	12	(5,204)	70.9	Dispatched by ISO-NE for load.
7/21/13	0	0	-	
7/22/13	0	0	-	
7/23/13	0	0	-	
7/24/13	0	0	-	
7/25/13	0	0	-	
7/26/13	0	0	-	
7/27/13	0	0	-	
7/28/13	0	0	-	
7/29/13	0	0	-	
7/30/13	13	5,161	39.8	Self-scheduled for environmental (RATA) testing & load.
7/31/13	19	10,968	39.4	Self-scheduled for environmental (RATA) testing & load.
8/1/13	17	10,855	34.3	Self-scheduled for environmental (RATA) testing & load.
8/2/13	8	6,421	33.5	Self-scheduled for environmental (RATA) testing & load.
8/3/13	0	0	-	
8/4/13	0	0	-	
8/5/13	0	0	-	
8/6/13	0	0	-	
8/7/13	0	0	-	
8/8/13	0	0	-	
8/9/13	0	0	-	
8/10/13	0	0	-	
8/11/13	0	0	-	
8/12/13	0	0	-	
8/13/13	0	0	-	
8/14/13	0	0	-	
8/15/13	0	0	-	
8/16/13	0	0	-	
8/17/13	0	0	-	
8/18/13	0	0	-	
8/19/13	0	0	-	
8/20/13	20	7,892	45.7	Self-scheduled for operational (DSI) testing & load.
8/21/13	24	9,119	46.6	Self-scheduled for operational (DSI) & VAR testing, & load.
8/22/13	24	9,223	46.8	Self-scheduled for operational (DSI) testing & load.
8/23/13	21	12,530	38.7	Self-scheduled for operational (DSI) testing & load.
8/24/13	0	0	-	
8/25/13	0	0	-	
8/26/13	19	7,929	46.3	Self-scheduled for operational (DSI) testing & load.
8/27/13	22	5,035	51.7	Self-scheduled for operational (DSI) testing & load.
8/28/13	0	0	-	
8/29/13	0	0	-	
8/30/13	0	0	-	
8/31/13	0	0	-	

Schiller 4

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
9/1/13	0	0	-	
9/2/13	0	0	-	
9/3/13	0	0	-	
9/4/13	0	0	-	
9/5/13	0	0	-	
9/6/13	0	0	-	
9/7/13	0	0	-	
9/8/13	0	0	-	
9/9/13	0	0	-	
9/10/13	0	0	-	
9/11/13	13	(18,300)	94.6	Dispatched by ISO-NE for load.
9/12/13	7	(7,434)	76.9	Dispatched by ISO-NE for load.
9/13/13	0	0	-	
9/14/13	0	0	-	
9/15/13	0	0	-	
9/16/13	0	0	-	
9/17/13	0	0	-	
9/18/13	0	0	-	
9/19/13	0	0	-	
9/20/13	0	0	-	
9/21/13	0	0	-	
9/22/13	0	0	-	
9/23/13	0	0	-	
9/24/13	0	0	-	
9/25/13	0	0	-	
9/26/13	0	0	-	
9/27/13	0	0	-	
9/28/13	0	0	-	
9/29/13	0	0	-	
9/30/13	0	0	-	
10/1/13	0	0	-	
10/2/13	0	0	-	
10/3/13	0	0	-	
10/4/13	0	0	-	
10/5/13	0	0	-	
10/6/13	0	0	-	
10/7/13	0	0	-	
10/8/13	0	0	-	
10/9/13	0	0	-	
10/10/13	0	0	-	
10/11/13	0	0	-	
10/12/13	0	0	-	
10/13/13	0	0	-	
10/14/13	0	0	-	
10/15/13	0	0	-	
10/16/13	0	0	-	
10/17/13	0	0	-	
10/18/13	0	0	-	
10/19/13	0	0	-	
10/20/13	0	0	-	
10/21/13	0	0	-	
10/22/13	0	0	-	
10/23/13	0	0	-	
10/24/13	0	0	-	
10/25/13	0	0	-	
10/26/13	0	0	-	
10/27/13	0	0	-	
10/28/13	0	0	-	
10/29/13	0	0	-	
10/30/13	0	0	-	
10/31/13	0	0	-	

Schiller 4

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
11/1/13	0	0	-	
11/2/13	0	0	-	
11/3/13	0	0	-	
11/4/13	0	0	-	
11/5/13	0	0	-	
11/6/13	0	0	-	
11/7/13	0	0	-	
11/8/13	0	0	-	
11/9/13	0	0	-	
11/10/13	0	0	-	
11/11/13	0	0	-	
11/12/13	0	0	-	
11/13/13	20	(13,673)	72.4	Dispatched by ISO-NE for load.
11/14/13	1	143	33.6	Dispatched by ISO-NE for load.
11/15/13	0	0	-	
11/16/13	0	0	-	
11/17/13	0	0	-	
11/18/13	0	0	-	
11/19/13	0	0	-	
11/20/13	0	0	-	
11/21/13	0	0	-	
11/22/13	0	0	-	
11/23/13	18	(13,234)	74.3	Dispatched by ISO-NE for load.
11/24/13	24	(18,532)	77.5	Self-scheduled for load.
11/25/13	24	(44,455)	101.5	Self-scheduled for load.
11/26/13	24	(7,725)	66.7	Dispatched by ISO-NE for load.
11/27/13	24	(18,218)	82.6	Dispatched by ISO-NE for load.
11/28/13	24	(87)	57.9	Self-scheduled for load.
11/29/13	24	(7,885)	68.3	Self-scheduled for load.
11/30/13	24	(2,905)	61.6	Self-scheduled for load.
12/1/13	24	851	56.6	Self-scheduled based on market price volatility, reliable op's, & for load.
12/2/13	24	(3,767)	63.0	Self-scheduled for load.
12/3/13	24	10,630	43.7	Self-scheduled based on market price volatility, reliable op's, & for load.
12/4/13	1	177	30.7	Self-scheduled for load.
12/5/13	0	0	-	
12/6/13	0	0	-	
12/7/13	1	219	33.6	Dispatched by ISO-NE for load.
12/8/13	13	(19,711)	86.8	Dispatched by ISO-NE for load.
12/9/13	3	(22,185)	81.5	Dispatched by ISO-NE for load.
12/10/13	3	(58,330)	118.1	Dispatched by ISO-NE for load.
12/11/13	3	(96,534)	154.0	Dispatched by ISO-NE for load.
12/12/13	4	(106,916)	158.2	Dispatched by ISO-NE for load.
12/13/13	5	(138,991)	189.1	Dispatched by ISO-NE for load.
12/14/13	14	(140,493)	192.1	Dispatched by ISO-NE for load.
12/15/13	11	(136,410)	195.7	Dispatched by ISO-NE for load.
12/16/13	6	(159,173)	223.4	Dispatched by ISO-NE for load.
12/17/13	12	(135,891)	187.2	Dispatched by ISO-NE for load.
12/18/13	5	(111,522)	164.2	Dispatched by ISO-NE for load.
12/19/13	7	(44,088)	104.3	Dispatched by ISO-NE for load.
12/20/13	3	(23,849)	83.2	Dispatched by ISO-NE for load.
12/21/13	0	134	42.0	Dispatched by ISO-NE for load.
12/22/13	0	0	-	
12/23/13	0	0	-	
12/24/13	2	(13,352)	75.3	Dispatched by ISO-NE for load.
12/25/13	7	(1,828)	60.2	Self-scheduled for load.
12/26/13	4	(7,672)	66.0	Self-scheduled for load.
12/27/13	3	(22,213)	80.8	Dispatched by ISO-NE for load.
12/28/13	10	(16,537)	73.6	Dispatched by ISO-NE for load.
12/29/13	24	(12,048)	71.8	Dispatched by ISO-NE for load.
12/30/13	24	(23,940)	90.2	Dispatched by ISO-NE for load.
12/31/13	23	(114,499)	172.7	Dispatched by ISO-NE for load.

Schiller 6

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
1/1/13	11	(39,054)	96.1	Self-scheduled for load.
1/2/13	7	(51,059)	106.7	Self-scheduled for load.
1/3/13	15	(26,079)	79.4	Self-scheduled for load.
1/4/13	9	(12,175)	66.6	Self-scheduled for load.
1/5/13	0	16	43.7	Dispatched by ISO-NE for load.
1/6/13	10	(6,652)	59.5	Dispatched by ISO-NE for load.
1/7/13	7	(6,115)	46.8	Dispatched by ISO-NE for load.
1/8/13	0	18	35.7	Dispatched by ISO-NE for load.
1/9/13	9	(7,535)	36.6	Dispatched by ISO-NE for load.
1/10/13	0	0	-	
1/11/13	10	(6,620)	37.4	Dispatched by ISO-NE for load.
1/12/13	11	(6,839)	60.8	Dispatched by ISO-NE for load.
1/13/13	0	0	-	
1/14/13	9	(7,880)	37.0	Dispatched by ISO-NE for load.
1/15/13	9	(7,732)	54.9	Dispatched by ISO-NE for load.
1/16/13	0	(17,401)	96.0	Dispatched by ISO-NE for load.
1/17/13	0	0	-	
1/18/13	5	(30,120)	99.1	Dispatched by ISO-NE for load.
1/19/13	2	(25,266)	80.0	Dispatched by ISO-NE for load.
1/20/13	4	(22,924)	85.4	Dispatched by ISO-NE for load.
1/21/13	5	(33,427)	88.3	Dispatched by ISO-NE for load.
1/22/13	6	(77,565)	129.2	Self-scheduled for load.
1/23/13	13	(131,589)	177.4	Self-scheduled for load.
1/24/13	15	(163,657)	205.4	Self-scheduled for load.
1/25/13	15	(195,417)	235.3	Dispatched by ISO-NE for load.
1/26/13	12	(127,316)	175.2	Self-scheduled for load.
1/27/13	2	(71,328)	214.3	Self-scheduled for load.
1/28/13	0	0	-	
1/29/13	0	0	-	
1/30/13	0	0	-	
1/31/13	0	0	-	
2/1/13	3	(63,263)	140.3	Dispatched by ISO-NE for load.
2/2/13	3	(132,694)	199.1	Dispatched by ISO-NE for load.
2/3/13	4	(78,940)	136.3	Dispatched by ISO-NE for load.
2/4/13	4	(133,489)	199.2	Dispatched by ISO-NE for load.
2/5/13	4	(74,424)	124.7	Dispatched by ISO-NE for load.
2/6/13	4	(61,841)	114.4	Dispatched by ISO-NE for load.
2/7/13	4	(118,643)	174.1	Dispatched by ISO-NE for load.
2/8/13	11	(77,163)	129.7	Dispatched by ISO-NE for load.
2/9/13	9	(135,511)	188.3	Dispatched by ISO-NE for load.
2/10/13	4	(199,770)	237.5	Dispatched by ISO-NE for load.
2/11/13	4	(182,022)	221.4	Dispatched by ISO-NE for load.
2/12/13	3	(186,441)	228.9	Dispatched by ISO-NE for load.
2/13/13	4	(135,016)	182.2	Dispatched by ISO-NE for load.
2/14/13	2	(61,616)	116.6	Dispatched by ISO-NE for load.
2/15/13	0	(18,205)	73.2	Dispatched by ISO-NE for load.
2/16/13	4	(39,569)	100.0	Dispatched by ISO-NE for load.
2/17/13	13	(45,643)	100.7	Dispatched by ISO-NE for load.
2/18/13	9	(74,738)	126.6	Dispatched by ISO-NE for load.
2/19/13	4	(62,086)	116.3	Dispatched by ISO-NE for load.
2/20/13	4	(44,108)	103.6	Dispatched by ISO-NE for load.
2/21/13	4	(66,652)	118.2	Dispatched by ISO-NE for load.
2/22/13	2	(18,761)	73.1	Dispatched by ISO-NE for load.
2/23/13	0	191	36.8	Dispatched by ISO-NE for load.
2/24/13	0	0	-	
2/25/13	0	0	-	
2/26/13	0	0	-	
2/27/13	0	0	-	
2/28/13	0	0	-	

Schiller 6

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
3/1/13	0	0	-	
3/2/13	0	0	-	
3/3/13	0	0	-	
3/4/13	3	(10,620)	57.3	Dispatched by ISO-NE for load.
3/5/13	4	382	53.6	Self-scheduled for VAR testing & load.
3/6/13	2	(7,209)	70.7	Dispatched by ISO-NE for load.
3/7/13	3	(11,043)	63.8	Dispatched by ISO-NE for load.
3/8/13	0	(8,917)	60.7	Dispatched by ISO-NE for load.
3/9/13	0	(1,192)	52.9	Dispatched by ISO-NE for load.
3/10/13	0	0	-	
3/11/13	0	0	-	
3/12/13	0	0	-	
3/13/13	0	0	-	
3/14/13	0	0	-	
3/15/13	0	0	-	
3/16/13	0	0	-	
3/17/13	0	0	-	
3/18/13	0	0	-	
3/19/13	0	0	-	
3/20/13	0	0	-	
3/21/13	0	0	-	
3/22/13	0	0	-	
3/23/13	0	0	-	
3/24/13	0	0	-	
3/25/13	0	0	-	
3/26/13	0	0	-	
3/27/13	0	0	-	
3/28/13	0	0	-	
3/29/13	0	0	-	
3/30/13	0	0	-	
3/31/13	0	0	-	
4/1/13	0	0	-	
4/2/13	0	0	-	
4/3/13	0	0	-	
4/4/13	0	0	-	
4/5/13	0	0	-	
4/6/13	0	0	-	
4/7/13	0	0	-	
4/8/13	0	0	-	
4/9/13	0	0	-	
4/10/13	4	181	39.3	Dispatched by ISO-NE for load, however unit trip.
4/11/13	13	3,756	39.0	Dispatched by ISO-NE for load, however unit trip.
4/12/13	12	1,330	50.0	Dispatched by ISO-NE for load, however unit trip.
4/13/13	0	0	-	
4/14/13	18	(8,517)	44.2	Dispatched by ISO-NE for load.
4/15/13	0	0	-	
4/16/13	19	(8,601)	46.9	Dispatched by ISO-NE for load.
4/17/13	0	0	-	
4/18/13	0	0	-	
4/19/13	0	0	-	
4/20/13	0	0	-	
4/21/13	0	0	-	
4/22/13	0	0	-	
4/23/13	0	0	-	
4/24/13	20	(15,495)	46.7	Dispatched by ISO-NE for load.
4/25/13	1	98	47.1	Dispatched by ISO-NE for load.
4/26/13	18	(11,121)	43.5	Dispatched by ISO-NE for load.
4/27/13	0	0	-	
4/28/13	10	(6,534)	54.6	Dispatched by ISO-NE for load.
4/29/13	12	(9,578)	75.2	Dispatched by ISO-NE for load.
4/30/13	17	(11,904)	53.5	Dispatched by ISO-NE for load.

Schiller 6

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
5/1/13	24	(12,072)	41.1	Dispatched by ISO-NE for load.
5/2/13	24	(11,506)	42.2	Dispatched by ISO-NE for load.
5/3/13	0	0	-	
5/4/13	0	0	-	
5/5/13	0	0	-	
5/6/13	0	0	-	
5/7/13	0	0	-	
5/8/13	0	0	-	
5/9/13	0	0	-	
5/10/13	0	0	-	
5/11/13	0	0	-	
5/12/13	0	0	-	
5/13/13	0	0	-	
5/14/13	0	0	-	
5/15/13	0	0	-	
5/16/13	0	0	-	
5/17/13	0	0	-	
5/18/13	0	0	-	
5/19/13	0	0	-	
5/20/13	0	0	-	
5/21/13	0	0	-	
5/22/13	0	0	-	
5/23/13	0	0	-	
5/24/13	0	0	-	
5/25/13	0	0	-	
5/26/13	0	0	-	
5/27/13	0	0	-	
5/28/13	0	0	-	
5/29/13	0	0	-	
5/30/13	14	(12,384)	72.7	Dispatched by ISO-NE for load.
5/31/13	3	(10,585)	76.1	Dispatched by ISO-NE for load.
6/1/13	12	(10,424)	66.6	Dispatched by ISO-NE for load.
6/2/13	11	(8,472)	63.3	Dispatched by ISO-NE for load.
6/3/13	0	0	-	
6/4/13	0	0	-	
6/5/13	0	0	-	
6/6/13	0	0	-	
6/7/13	0	0	-	
6/8/13	0	0	-	
6/9/13	0	0	-	
6/10/13	0	0	-	
6/11/13	0	0	-	
6/12/13	0	0	-	
6/13/13	0	0	-	
6/14/13	0	0	-	
6/15/13	0	0	-	
6/16/13	0	0	-	
6/17/13	0	0	-	
6/18/13	0	0	-	
6/19/13	0	0	-	
6/20/13	0	0	-	
6/21/13	0	0	-	
6/22/13	0	0	-	
6/23/13	0	0	-	
6/24/13	13	(42,175)	148.9	Dispatched by ISO-NE for load.
6/25/13	15	(13,463)	83.2	Dispatched by ISO-NE for load.
6/26/13	13	(8,795)	64.5	Dispatched by ISO-NE for load & ISO-NE capability audit.
6/27/13	0	0	-	
6/28/13	0	0	-	
6/29/13	0	0	-	
6/30/13	0	0	-	

Schiller 6

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
7/1/13	0	0	-	
7/2/13	0	0	-	
7/3/13	0	0	-	
7/4/13	11	(12,069)	74.5	Dispatched by ISO-NE for load.
7/5/13	11	(8,658)	67.6	Dispatched by ISO-NE for load.
7/6/13	12	(12,780)	88.2	Dispatched by ISO-NE for load.
7/7/13	12	(13,148)	85.7	Dispatched by ISO-NE for load.
7/8/13	10	(7,971)	75.7	Dispatched by ISO-NE for load.
7/9/13	0	0	-	
7/10/13	0	0	-	
7/11/13	0	0	-	
7/12/13	0	0	-	
7/13/13	0	0	-	
7/14/13	0	0	-	
7/15/13	14	(14,503)	80.3	Dispatched by ISO-NE for load.
7/16/13	14	(40,949)	116.1	Dispatched by ISO-NE for load.
7/17/13	16	(48,819)	110.7	Dispatched by ISO-NE for load.
7/18/13	16	(48,898)	107.5	Dispatched by ISO-NE for load & VAR testing.
7/19/13	16	(55,394)	139.1	Dispatched by ISO-NE for load.
7/20/13	15	(5,237)	61.8	Dispatched by ISO-NE for load.
7/21/13	0	0	-	
7/22/13	0	0	-	
7/23/13	0	0	-	
7/24/13	0	0	-	
7/25/13	0	0	-	
7/26/13	0	0	-	
7/27/13	0	0	-	
7/28/13	0	0	-	
7/29/13	0	0	-	
7/30/13	0	0	-	
7/31/13	0	0	-	
8/1/13	0	0	-	
8/2/13	0	0	-	
8/3/13	0	0	-	
8/4/13	0	0	-	
8/5/13	12	3,720	38.1	Self-scheduled for environmental testing (RATA) & load.
8/6/13	8	10,626	32.2	Self-scheduled for environmental testing (RATA) & load.
8/7/13	0	5,254	35.4	Self-scheduled for environmental testing (RATA) & load.
8/8/13	0	0	-	
8/9/13	0	0	-	
8/10/13	0	0	-	
8/11/13	0	0	-	
8/12/13	0	0	-	
8/13/13	0	0	-	
8/14/13	0	0	-	
8/15/13	0	0	-	
8/16/13	0	0	-	
8/17/13	0	0	-	
8/18/13	0	0	-	
8/19/13	0	0	-	
8/20/13	0	0	-	
8/21/13	0	0	-	
8/22/13	0	0	-	
8/23/13	0	0	-	
8/24/13	0	0	-	
8/25/13	0	0	-	
8/26/13	0	0	-	
8/27/13	0	0	-	
8/28/13	0	0	-	
8/29/13	0	0	-	
8/30/13	0	0	-	
8/31/13	0	0	-	

Schiller 6

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
9/1/13	0	0	-	
9/2/13	0	0	-	
9/3/13	0	0	-	
9/4/13	0	0	-	
9/5/13	0	0	-	
9/6/13	0	0	-	
9/7/13	0	0	-	
9/8/13	0	0	-	
9/9/13	0	0	-	
9/10/13	0	0	-	
9/11/13	16	(20,958)	91.4	Dispatched by ISO-NE for load.
9/12/13	7	(10,146)	80.7	Dispatched by ISO-NE for load.
9/13/13	0	0	-	
9/14/13	0	0	-	
9/15/13	0	0	-	
9/16/13	0	0	-	
9/17/13	0	0	-	
9/18/13	0	0	-	
9/19/13	0	0	-	
9/20/13	0	0	-	
9/21/13	0	0	-	
9/22/13	0	0	-	
9/23/13	0	0	-	
9/24/13	0	0	-	
9/25/13	0	0	-	
9/26/13	0	0	-	
9/27/13	0	0	-	
9/28/13	0	0	-	
9/29/13	0	0	-	
9/30/13	0	0	-	
10/1/13	0	0	-	
10/2/13	0	0	-	
10/3/13	0	0	-	
10/4/13	0	0	-	
10/5/13	0	0	-	
10/6/13	0	0	-	
10/7/13	0	0	-	
10/8/13	0	0	-	
10/9/13	0	0	-	
10/10/13	0	0	-	
10/11/13	0	0	-	
10/12/13	0	0	-	
10/13/13	0	0	-	
10/14/13	0	0	-	
10/15/13	0	0	-	
10/16/13	0	0	-	
10/17/13	0	0	-	
10/18/13	0	0	-	
10/19/13	0	0	-	
10/20/13	0	0	-	
10/21/13	11	(2,710)	39.6	Dispatched by ISO-NE for load.
10/22/13	11	2,089	37.8	Dispatched by ISO-NE for load.
10/23/13	0	0	-	
10/24/13	0	0	-	
10/25/13	0	0	-	
10/26/13	0	0	-	
10/27/13	0	0	-	
10/28/13	0	0	-	
10/29/13	0	0	-	
10/30/13	0	0	-	
10/31/13	0	0	-	

Schiller 6

Date	Number of Hours Serving ES Load	Above-Market Energy Cost $	Average LMPs Received $/MWh	Reason for Dispatch (See Page 1 - Additional factors could influence dispatch decisions.)
11/1/13	0	0	-	
11/2/13	0	0	-	
11/3/13	0	0	-	
11/4/13	0	0	-	
11/5/13	0	0	-	
11/6/13	0	0	-	
11/7/13	0	0	-	
11/8/13	0	0	-	
11/9/13	0	0	-	
11/10/13	0	0	-	
11/11/13	0	0	-	
11/12/13	0	0	-	
11/13/13	21	(17,068)	73.3	Dispatched by ISO-NE for load.
11/14/13	1	(325)	33.6	Dispatched by ISO-NE for load.
11/15/13	0	0	-	
11/16/13	0	0	-	
11/17/13	0	0	-	
11/18/13	0	0	-	
11/19/13	0	0	-	
11/20/13	0	0	-	
11/21/13	0	0	-	
11/22/13	0	0	-	
11/23/13	18	(16,157)	74.8	Dispatched by ISO-NE for load.
11/24/13	24	(21,601)	77.6	Self-scheduled for load.
11/25/13	24	(48,038)	101.5	Self-scheduled for load.
11/26/13	24	(11,815)	66.6	Dispatched by ISO-NE for load.
11/27/13	24	(20,813)	82.7	Dispatched by ISO-NE for load.
11/28/13	24	(1,435)	56.5	Self-scheduled for load.
11/29/13	24	(10,789)	68.4	Self-scheduled for load.
11/30/13	24	(6,204)	62.0	Self-scheduled for load.
12/1/13	24	(1,630)	56.6	Self-scheduled for load.
12/2/13	24	(7,115)	64.6	Self-scheduled for load.
12/3/13	24	7,741	43.6	Self-scheduled based on market price volatility, reliable op's, & for load.
12/4/13	1	193	30.7	Dispatched by ISO-NE for load.
12/5/13	0	0	-	
12/6/13	0	0	-	
12/7/13	0	0	-	
12/8/13	15	(19,596)	99.1	Dispatched by ISO-NE for load.
12/9/13	6	(25,289)	81.7	Dispatched by ISO-NE for load.
12/10/13	5	(62,722)	118.5	Dispatched by ISO-NE for load.
12/11/13	5	(99,294)	154.1	Dispatched by ISO-NE for load.
12/12/13	6	(110,341)	158.1	Dispatched by ISO-NE for load.
12/13/13	7	(142,104)	189.0	Dispatched by ISO-NE for load.
12/14/13	14	(143,548)	192.0	Dispatched by ISO-NE for load.
12/15/13	13	(138,655)	196.4	Dispatched by ISO-NE for load.
12/16/13	8	(161,800)	225.7	Dispatched by ISO-NE for load.
12/17/13	17	(138,967)	187.1	Dispatched by ISO-NE for load.
12/18/13	11	(114,497)	164.6	Dispatched by ISO-NE for load.
12/19/13	9	(46,024)	103.8	Dispatched by ISO-NE for load.
12/20/13	6	(27,249)	84.3	Dispatched by ISO-NE for load.
12/21/13	0	(87)	40.7	Dispatched by ISO-NE for load.
12/22/13	0	0	-	
12/23/13	0	0	-	
12/24/13	5	(12,995)	73.7	Dispatched by ISO-NE for load.
12/25/13	11	(4,364)	60.3	Self-scheduled for load.
12/26/13	5	(10,751)	65.9	Self-scheduled for load.
12/27/13	5	(24,836)	80.2	Dispatched by ISO-NE for load.
12/28/13	5	(22,528)	84.3	Dispatched by ISO-NE for load.
12/29/13	0	8,724	-	
12/30/13	0	0	-	
12/31/13	12	(68,823)	206.4	Dispatched by ISO-NE for load.

REDACTED

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. CLF 1-006 | **Page 1 of 2**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Please provide a schedule identifying typical or average weekly offer/dispatch prices used by PSNH (internally or for market bidding purposes) for each PSNH fossil-fired generating unit and the corresponding weekly average day-ahead and real-time energy market prices.

Response:
Pursuant to Puc 203.08(d) and RSA 363:28, VI, PSNH provides this response on a confidential basis to the Commission Staff and the Office of Consumer Advocate. PSNH submits that it has a good faith basis for seeking confidential treatment of the documents in this response and that it intends to submit a motion for confidential treatment of the documents prior to the commencement of any hearing in this proceeding.

Please see the attached table. Figures shown are typical/average running costs at full load and do not include start-up costs. ISO-NE day-ahead and real-time energy market clearing prices are available from ISO-NE's website:

http://www.iso-ne.com/markets/hrly_data/selectHourlyLMP.do?locationType=HUB&node=4002&startDate=4%2F22%2F2010&endDate=04%2F23%2F2010

REDACTED

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. CLF 1-007 | **Page 1 of 2**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Please provide a complete accounting of monthly capacity market revenues received for each PSNH fossil-fired generating unit.

Response:
Please see the attached table.

PSNH Fossil-Fired Generation - Capacity Market Revenues - $(000)

Merrimack 1

Year	Month	Capacity Auction Revenues	Adjustments PER	Adjustments Availability	Net Capacity Revenue
2013	1	285	0	0	285
	2	285	(1)	0	284
	3	285	(1)	0	284
	4	285	(1)	0	284
	5	285	(1)	0	284
	6	288	(1)	0	287
	7	288	(2)	0	286
	8	288	(8)	0	280
	9	288	(8)	0	280
	10	288	(8)	0	280
	11	288	(8)	0	280
	12	288	(9)	22	301
Total		3,442	(50)	22	3,414

Merrimack 2

Year	Month	Capacity Auction Revenues	Adjustments PER	Adjustments Availability	Net Capacity Revenue
2013	1	811	0	0	811
	2	811	(4)	0	807
	3	811	(4)	0	807
	4	811	(4)	0	807
	5	811	(4)	0	807
	6	824	(4)	0	820
	7	824	(6)	0	818
	8	824	(23)	0	801
	9	824	(23)	0	801
	10	824	(24)	0	800
	11	824	(24)	0	800
	12	824	(27)	67	864
Total		9,823	(146)	67	9,745

Newington

Year	Month	Capacity Auction Revenues	Adjustments PER	Adjustments Availability	Net Capacity Revenue
2013	1	1,015	0	0	1,015
	2	1,015	(5)	0	1,010
	3	1,015	(5)	0	1,010
	4	1,015	(5)	0	1,010
	5	1,015	(5)	0	1,010
	6	1,025	(5)	0	1,019
	7	1,025	(7)	0	1,018
	8	1,025	(28)	0	997
	9	1,025	(28)	0	997
	10	1,025	(29)	0	996
	11	1,025	(29)	0	996
	12	1,025	(32)	(569)	424
Total		12,245	(177)	(569)	11,499

Schiller 4

Year	Month	Capacity Auction Revenues	Adjustments PER	Adjustments Availability	Net Capacity Revenue
2013	1	120	0	0	120
	2	120	(1)	0	120
	3	120	(1)	0	120
	4	120	(1)	0	120
	5	120	(1)	0	120
	6	122	(1)	0	121
	7	122	(1)	0	121
	8	122	(3)	0	118
	9	122	(3)	0	118
	10	122	(3)	0	118
	11	122	(3)	0	118
	12	122	(4)	8	126
Total		1,453	(21)	8	1,440

Schiller 6

Year	Month	Capacity Auction Revenues	Adjustments PER	Adjustments Availability	Net Capacity Revenue
2013	1	122	0	0	122
	2	122	(1)	0	121
	3	122	(1)	0	121
	4	122	(1)	0	121
	5	122	(1)	0	121
	6	123	(1)	0	122
	7	123	(1)	0	122
	8	123	(3)	0	119
	9	123	(3)	0	119
	10	123	(3)	0	119
	11	123	(3)	0	119
	12	123	(4)	7	126
Total		1,467	(21)	7	1,453

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. CLF 1-008 **Page 1 of 1**
Request from: Conservation Law Foundation

Witness: William H. Smagula, Frederick White

Request:
Please provide, in a schedule for each PSNH fossil-fired generating unit, the 2013 dates on which each unit ran out of economic merit for any purpose, the reason for such operation if any, and the above-market costs of such operation, in a format similar to PSNH's data response to Office of Consumer Advocate Set 2, Data Request 16, in Docket No. DE 13-108.

Response:
Please refer to the tables provided in Q-CLF 1-005 which include the information requested here.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 | **Date of Response: 08/01/2014**
Request No. CLF 1-009 | **Page 1 of 4**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Please provide a table showing monthly energy MWh, hours of operation, energy and capacity market revenues from ISO-NE, heat rate, full load heat rate, capacity factor, and capacity factor not taking into account planned outages for each PSNH fossil-fired generating unit and Schiller Unit 5.

Response:
Please see the attached spreadsheets.

PSNH Fossil-Fired Generation

		Merrimack 1			Merrimack 2		
Year	Month	Generation GWh	Hours of Operation	Revenue $(000)	Generation GWh	Hours of Operation	Revenue $(000)
2013	1	57.397	571	5,858	222.317	744	19,274
	2	69.396	672	8,344	207.917	672	24,846
	3	66.268	695	3,520	175.066	608	8,607
	4	3.569	46	205	0.000	0	0
	5	4.058	43	253	6.875	27	412
	6	18.041	198	799	44.242	177	1,965
	7	38.483	403	2,431	122.872	449	7,707
	8	7.436	90	235	17.690	85	569
	9	3.595	41	260	8.780	36	405
	10	0.000	0	0	0.000	0	0
	11	19.531	204	1,301	0.000	0	0
	12	72.525	744	7,206	151.555	522	17,014
Total		360.300	3,707	30,414	957.314	3,320	80,799

		Newington			Schiller 4		
Year	Month	Generation GWh	Hours of Operation	Revenue $(000)	Generation GWh	Hours of Operation	Revenue $(000)
2013	1	17.137	116	2,978	16.035	416	2,041
	2	19.804	145	3,505	18.810	455	2,901
	3	3.652	36	343	8.877	248	628
	4	0.000	0	0	4.766	179	238
	5	1.242	14	96	2.948	103	143
	6	1.890	22	109	1.879	66	170
	7	17.847	133	2,270	6.980	221	629
	8	7.608	52	365	5.193	155	231
	9	0.983	13	54	0.854	26	74
	10	0.000	0	0	0.000	0	0
	11	1.765	9	55	6.978	207	523
	12	8.905	66	1,635	21.635	574	2,643
Total		80.834	606	11,408	94.954	2,650	10,221

		Schiller 5			Schiller 6		
Year	Month	Generation GWh	Hours of Operation	Revenue $(000)	Generation GWh	Hours of Operation	Revenue $(000)
2013	1	29.658	724	2,557	15.283	405	1,843
	2	27.438	672	3,294	21.722	524	3,189
	3	29.802	743	1,577	2.918	85	176
	4	12.071	299	529	3.419	144	170
	5	28.454	682	1,145	2.178	77	120
	6	30.347	719	1,111	2.066	66	180
	7	30.306	744	1,562	6.257	174	599
	8	30.829	744	1,075	0.991	35	34
	9	29.780	720	1,111	0.907	29	79
	10	24.672	598	836	0.658	22	25
	11	28.781	694	1,327	6.963	208	521
	12	29.539	737	2,787	18.607	498	2,367
Total		331.680	8,076	18,911	81.968	2,267	9,304

2013	CF	CF w/o PO	CF	CF w/o PO	CF	CF w/o PO	CF	CF w/o PO	CF	CF w/o PO	CF	CF w/o PO
	MK1		MK2		NT		SR4		SR5		SR6	
Jan	71.4%	71.4%	90.5%	90.5%	5.8%	5.8%	45.9%	45.9%	92.7%	92.7%	42.8%	42.8%
Feb	95.6%	95.6%	93.8%	93.8%	7.4%	7.4%	59.6%	59.6%	95.0%	95.0%	67.3%	67.3%
Mar	82.5%	82.5%	71.3%	71.3%	1.2%	1.2%	25.4%	25.4%	93.2%	93.2%	8.2%	25.4%
Apr	4.6%	4.6%	0.0%	0.0%	0.0%	0.0%	14.1%	14.1%	39.0%	94.1%	9.9%	15.4%
May	5.1%	5.1%	2.8%	2.8%	0.4%	0.4%	8.4%	8.4%	88.9%	96.3%	6.1%	6.1%
Jun	23.2%	23.2%	18.6%	18.6%	0.7%	0.7%	5.6%	5.6%	98.0%	98.0%	6.0%	6.0%
Jul	47.9%	47.9%	50.0%	50.0%	6.0%	6.0%	20.0%	20.0%	94.7%	94.7%	17.5%	17.5%
Aug	9.3%	9.3%	7.2%	7.2%	2.6%	2.6%	14.8%	14.8%	96.4%	96.4%	2.8%	2.8%
Sep	4.6%	4.6%	3.7%	7.4%	0.3%	0.3%	2.5%	2.5%	96.2%	96.2%	2.6%	2.6%
Oct	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	77.1%	77.1%	1.8%	1.8%
Nov	25.1%	84.7%	0.0%	0.0%	0.6%	0.6%	20.6%	20.6%	93.0%	93.0%	20.1%	20.1%
Dec	90.3%	90.3%	61.7%	61.7%	3.0%	3.0%	61.9%	61.9%	92.3%	92.3%	52.1%	52.1%
TOTAL	38.1%	40.9%	33.1%	37.9%	2.3%	2.4%	23.1%	23.1%	88.1%	93.1%	19.5%	21.3%

CF: capacity factor
CF w/o PO: capacity factor excluding planned outages

Heat Rate (btu/kwhr)

2013	MK1	MK2	NT	SR4	SR5	SR6
Jan	10,234	10,211	13,068	13,082	16,761	13,125
Feb	10,411	10,159	13,192	12,884	16,176	12,081
Mar	10,430	10,229	15,487	13,479	16,628	12,641
Apr	11,164	-	-	15,093	15,465	14,097
May	12,554	10,470	25,962	13,604	14,973	12,092
Jun	10,855	10,290	11,181	15,178	15,518	11,727
Jul	10,676	10,011	13,427	11,958	15,572	10,654
Aug	11,011	10,754	14,404	13,228	15,873	12,691
Sep	11,442	10,525	18,425	6,695	15,457	14,454
Oct	-	-	-		15,342	9,778
Nov	12,765	-	18,107	12,738	14,956	11,681
Dec	10,641	10,280	13,436	10,280	16,074	9,750

Full Load Heat Rate (btu/kwhr)

	MK1	MK2	NT	SR4	SR5	SR6
	9,900	9,520	10,900	12,900	15,400	12,300

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014 **Date of Response: 08/01/2014**
Request No. CLF 1-011 **Page 1 of 1**
Request from: Conservation Law Foundation

Witness: Michael L. Shelnitz

Request:
Please provide an accounting of any billing to PSNH energy service for 2013 costs associated with activities related to the Northern Pass Transmission Project, including but not limited to negotiations regarding a potential power purchase agreement.

Response:
Northern Pass Transmission (NPT) project costs are charged to an accounting unit that is specific to NPT. No 2013 costs were allocated from the NPT accounting unit to the PSNH Energy Service segment.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 07/11/2014
Request No. CLF 1-011-SP01
Request from: Conservation Law Foundation

Date of Supplemental Response: 09/19/2014
Page 1 of 1

Witness: Michael L. Shelnitz

Request:
Please provide an accounting of any billing to PSNH energy service for 2013 costs associated with activities related to the Northern Pass Transmission Project, including but not limited to negotiations regarding a potential power purchase agreement.

Response:

Original Response
Northern Pass Transmission (NPT) project costs are charged to an accounting unit that is specific to NPT. No 2013 costs were allocated from the NPT accounting unit to the PSNH Energy Service segment.

Supplemental Response
PSNH's initial response to this request was based upon an interpretation of the question as seeking information about whether the costs of the Northern Pass Transmission (NPT) project were billed to PSNH's Energy Service segment. Accordingly, the response stated that NPT costs are charged to NPT, and are not allocated to PSNH's Energy Service segment.

In light of PSNH's review of subsequent data requests, PSNH believes its interpretation of and response to CLF 1-011 should be clarified. Accordingly, PSNH notes that its 2013 Energy Service costs do include costs associated with negotiating a potential power purchase agreement with Hydro Quebec for energy to be delivered through the proposed NPT line for the benefit of PSNH Energy Service customers. As PSNH did not consider such costs to be "activities related to the Northern Pass Transmission Project," but rather activities related to power purchases for Energy Service customers, they were not included in the initial response. For additional description of these costs, please refer to the responses to CLF 2-011 and 2-012

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014
Request No. CLF 2-003
Request from: Conservation Law Foundation

Date of Response: 09/19/2014

Witness: Frederick White

Request:
Reference PSNH response to CLF 1-004, pages 2 and 3. Please provide a version of these schedules showing the amounts on a monthly basis.

Response:
Please see the attached table.

PSNH Fossil-Fired Generation - Energy Market and NCPC

Merrimack 1

2013	Generation MWh	Energy Market Revenue $(000)	Energy Market Revenue $/MWh	Hours	NCPC Revenue $(000)	NCPC Revenue $/MWh
Jan	57,397	5,858	102.1	34	22	0.4
Feb	69,396	8,344	120.2	14	2	0.0
Mar	66,268	3,520	53.1	12	1	0.0
Apr	3,569	205	57.6	42	21	5.9
May	4,058	253	62.5	18	7	1.8
Jun	18,041	799	44.3	42	28	1.5
Jul	38,483	2,431	63.2	42	4	0.1
Aug	7,436	235	31.6	0	0	0.0
Sep	3,595	260	72.3	0	0	0.0
Oct	0	0	0.0	0	0	0.0
Nov	19,531	1,301	66.6	7	4	0.2
Dec	72,525	7,206	99.4	28	5	0.1
Total	360,300	30,414	84.4	239	95	0.3

Merrimack 2

2013	Generation MWh	Energy Market Revenue $(000)	Energy Market Revenue $/MWh	Hours	NCPC Revenue $(000)	NCPC Revenue $/MWh
Jan	222,317	19,274	86.7	30	4	0.0
Feb	207,917	24,846	119.5	9	6	0.0
Mar	175,066	8,607	49.2	37	3	0.0
Apr	0	0	0.0	0	0	0.0
May	6,875	412	59.9	7	0	0.0
Jun	44,242	1,965	44.4	6	111	2.5
Jul	122,872	7,707	62.7	18	45	0.4
Aug	17,690	569	32.2	0	0	0.0
Sep	8,780	405	46.1	0	0	0.0
Oct	0	0	0.0	0	0	0.0
Nov	0	0	0.0	0	0	0.0
Dec	151,555	17,014	112.3	22	7	0.0
Total	957,314	80,799	84.4	129	176	0.2

Newington

2013	Generation MWh	Energy Market Revenue $(000)	Energy Market Revenue $/MWh	Hours	NCPC Revenue $(000)	NCPC Revenue $/MWh
Jan	17,137	2,978	173.8	55	1,038	60.6
Feb	19,804	3,505	177.0	120	2,112	106.7
Mar	3,652	343	93.9	15	87	23.8
Apr	0	0	0.0	0	0	0.0
May	1,242	96	77.0	11	131	105.4
Jun	1,890	109	57.6	17	436	230.9
Jul	17,847	2,270	127.2	89	1,421	79.6
Aug	7,608	365	47.9	28	311	40.8
Sep	983	54	55.0	9	108	109.9
Oct	0	0	0.0	0	0	0.0
Nov	1,765	55	30.9	7	199	112.8
Dec	8,905	1,635	183.6	57	634	71.2
Total	80,834	11,408	141.1	408	6,478	80.1

Schiller 4

2013	Generation MWh	Energy Market Revenue $(000)	Energy Market Revenue $/MWh	Hours	NCPC Revenue $(000)	NCPC Revenue $/MWh
Jan	16,035	2,041	127.3	16	24	1.5
Feb	18,810	2,901	154.3	1	0	0.0
Mar	8,877	628	70.8	142	30	3.3
Apr	4,766	238	49.9	157	130	27.2
May	2,948	143	48.6	82	58	19.8
Jun	1,879	170	90.3	30	16	8.8
Jul	6,980	629	90.1	31	14	1.9
Aug	5,193	231	44.5	0	0	0.0
Sep	854	74	87.2	1	1	0.7
Oct	0	0	0.0	0	0	0.0
Nov	6,978	523	74.9	43	7	1.0
Dec	21,635	2,643	122.1	40	6	0.3
Total	94,954	10,221	107.6	543	285	3.0

Schiller 6

2013	Generation MWh	Energy Market Revenue $(000)	Energy Market Revenue $/MWh	Hours	NCPC Revenue $(000)	NCPC Revenue $/MWh
Jan	15,283	1,843	120.6	60	60	3.9
Feb	21,722	3,189	146.8	1	0	0.0
Mar	2,918	176	60.4	60	21	7.1
Apr	3,419	170	49.6	98	82	24.1
May	2,178	120	55.2	59	44	20.4
Jun	2,066	180	87.2	31	15	7.4
Jul	6,257	599	95.8	28	9	1.4
Aug	991	34	34.5	0	0	0.0
Sep	907	79	87.2	2	1	1.4
Oct	658	25	38.7	16	11	16.5
Nov	6,963	521	74.8	70	11	1.6
Dec	18,607	2,367	127.2	45	9	0.5
Total	81,968	9,304	113.5	470	264	3.2

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014 **Date of Response: 09/19/2014**
Request No. CLF 2-004 **Page 1 of 31**
Request from: Conservation Law Foundation

Witness: William H. Smagula, Frederick White

Request:
Reference PSNH response to CLF 1-005, pages 2-31. Please provide, by reproducing these schedules with new columns or otherwise, data showing (a) the MWhs generated, (b) the number of hours that the respective generation units were serving third-party load, and (c) the MWhs and revenues for such third-party sales.

Response:
Please see the attached table.

Note: Some hours/days include both a portion of generation serving PSNH ES load and a portion surplus to PSNH ES load. Generation MWh and revenues surplus to PSNH ES load are based on a pro-rata distribution of total generation MWh and revenues. Revenues include day-ahead energy, real-time energy, and Net Commitment Period Compensation revenues.

Merrimack 1

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
1/1/13	2,451	0	0	0
1/2/13	2,376	0	0	0
1/3/13	2,609	0	0	0
1/4/13	2,573	0	0	0
1/5/13	2,118	0	0	0
1/6/13	2,209	0	0	0
1/7/13	2,121	0	0	0
1/8/13	2,051	0	0	0
1/9/13	0	0	0	0
1/10/13	0	0	0	0
1/11/13	0	0	0	0
1/12/13	0	0	0	0
1/13/13	0	0	0	0
1/14/13	0	0	0	0
1/15/13	0	0	0	0
1/16/13	1,733	0	0	0
1/17/13	2,444	0	0	0
1/18/13	2,444	0	0	0
1/19/13	2,580	0	0	0
1/20/13	2,248	0	0	0
1/21/13	2,529	0	0	0
1/22/13	2,613	0	0	0
1/23/13	2,633	0	0	0
1/24/13	2,631	0	0	0
1/25/13	2,638	0	0	0
1/26/13	2,635	0	0	0
1/27/13	2,636	0	0	0
1/28/13	2,625	0	0	0
1/29/13	2,503	0	0	0
1/30/13	1,859	0	0	0
1/31/13	2,141	0	0	0
2/1/13	2,597	0	0	0
2/2/13	2,444	0	0	0
2/3/13	2,248	0	0	0
2/4/13	2,482	0	0	0
2/5/13	2,615	0	0	0
2/6/13	2,592	0	0	0
2/7/13	2,571	0	0	0
2/8/13	2,587	0	0	0
2/9/13	2,581	0	0	0
2/10/13	2,636	0	0	0
2/11/13	2,638	0	0	0
2/12/13	2,503	0	0	0
2/13/13	2,603	0	0	0
2/14/13	2,525	0	0	0
2/15/13	2,595	0	0	0
2/16/13	2,422	0	0	0
2/17/13	2,532	0	0	0
2/18/13	2,597	0	0	0
2/19/13	2,608	0	0	0
2/20/13	2,531	0	0	0
2/21/13	2,626	0	0	0
2/22/13	2,606	0	0	0
2/23/13	2,132	0	0	0
2/24/13	2,148	0	0	0
2/25/13	2,128	0	0	0
2/26/13	2,203	0	0	0
2/27/13	2,399	0	0	0
2/28/13	2,248	0	0	0

Merrimack 1

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
3/1/13	2,052	0	0	0
3/2/13	2,100	0	0	0
3/3/13	2,177	0	0	0
3/4/13	2,292	0	0	0
3/5/13	2,293	0	0	0
3/6/13	2,467	0	0	0
3/7/13	2,559	0	0	0
3/8/13	2,505	0	0	0
3/9/13	2,307	0	0	0
3/10/13	2,113	0	0	0
3/11/13	2,178	0	0	0
3/12/13	2,199	0	0	0
3/13/13	2,163	2	21	470
3/14/13	2,363	0	0	0
3/15/13	2,496	0	0	0
3/16/13	2,225	0	0	0
3/17/13	2,349	0	0	0
3/18/13	2,453	0	0	0
3/19/13	2,594	0	0	0
3/20/13	2,574	0	0	0
3/21/13	2,318	0	0	0
3/22/13	2,350	0	0	0
3/23/13	2,176	0	0	0
3/24/13	2,082	0	0	0
3/25/13	2,440	0	0	0
3/26/13	2,198	0	0	0
3/27/13	2,124	0	0	0
3/28/13	2,113	0	0	0
3/29/13	2,011	2	5	163
3/30/13	0	0	0	0
3/31/13	0	0	0	0
4/1/13	0	0	0	0
4/2/13	1,445	0	0	0
4/3/13	2,064	0	0	0
4/4/13	60	0	0	0
4/5/13	0	0	0	0
4/6/13	0	0	0	0
4/7/13	0	0	0	0
4/8/13	0	0	0	0
4/9/13	0	0	0	0
4/10/13	0	0	0	0
4/11/13	0	0	0	0
4/12/13	0	0	0	0
4/13/13	0	0	0	0
4/14/13	0	0	0	0
4/15/13	0	0	0	0
4/16/13	0	0	0	0
4/17/13	0	0	0	0
4/18/13	0	0	0	0
4/19/13	0	0	0	0
4/20/13	0	0	0	0
4/21/13	0	0	0	0
4/22/13	0	0	0	0
4/23/13	0	0	0	0
4/24/13	0	0	0	0
4/25/13	0	0	0	0
4/26/13	0	0	0	0
4/27/13	0	0	0	0
4/28/13	0	0	0	0
4/29/13	0	0	0	0
4/30/13	0	0	0	0

Merrimack 1

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	Generation Surplus to PSNH ES Load: MWh	Generation Surplus to PSNH ES Load: Revenues - $
5/1/13	0	0	0	0
5/2/13	0	0	0	0
5/3/13	0	0	0	0
5/4/13	0	0	0	0
5/5/13	0	0	0	0
5/6/13	0	0	0	0
5/7/13	0	0	0	0
5/8/13	0	0	0	0
5/9/13	0	0	0	0
5/10/13	0	0	0	0
5/11/13	0	0	0	0
5/12/13	0	0	0	0
5/13/13	0	0	0	0
5/14/13	0	0	0	0
5/15/13	0	0	0	0
5/16/13	0	0	0	0
5/17/13	0	0	0	0
5/18/13	0	0	0	0
5/19/13	0	0	0	0
5/20/13	0	0	0	0
5/21/13	0	0	0	0
5/22/13	0	0	0	0
5/23/13	0	0	0	0
5/24/13	0	0	0	0
5/25/13	0	0	0	0
5/26/13	0	0	0	0
5/27/13	0	0	0	0
5/28/13	0	0	0	0
5/29/13	0	0	0	0
5/30/13	1,589	0	0	0
5/31/13	2,468	4	48	1,680
6/1/13	2,427	0	0	0
6/2/13	2,421	0	0	0
6/3/13	2,101	0	0	0
6/4/13	2,086	3	40	759
6/5/13	2,267	4	57	818
6/6/13	0	0	0	0
6/7/13	0	0	0	0
6/8/13	0	0	0	0
6/9/13	0	0	0	0
6/10/13	0	0	0	0
6/11/13	0	0	0	0
6/12/13	0	0	0	0
6/13/13	0	0	0	0
6/14/13	0	0	0	0
6/15/13	0	0	0	0
6/16/13	0	0	0	0
6/17/13	0	0	0	0
6/18/13	0	0	0	0
6/19/13	0	0	0	0
6/20/13	0	0	0	0
6/21/13	0	0	0	0
6/22/13	0	0	0	0
6/23/13	0	0	0	0
6/24/13	816	0	0	0
6/25/13	2,325	0	0	0
6/26/13	2,091	0	0	0
6/27/13	1,508	0	0	0
6/28/13	0	0	0	0
6/29/13	0	0	0	0
6/30/13	0	0	0	0

Merrimack 1

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
7/1/13	0	0	0	0
7/2/13	0	0	0	0
7/3/13	0	0	0	0
7/4/13	0	0	0	0
7/5/13	1,823	0	0	0
7/6/13	2,457	0	0	0
7/7/13	2,382	0	0	0
7/8/13	2,411	0	0	0
7/9/13	2,169	0	0	0
7/10/13	2,238	0	0	0
7/11/13	2,198	0	0	0
7/12/13	2,054	0	0	0
7/13/13	2,005	0	0	0
7/14/13	2,367	0	0	0
7/15/13	2,416	0	0	0
7/16/13	2,539	0	0	0
7/17/13	2,457	0	0	0
7/18/13	2,485	0	0	0
7/19/13	2,333	0	0	0
7/20/13	2,357	0	0	0
7/21/13	1,792	0	0	0
7/22/13	0	0	0	0
7/23/13	0	0	0	0
7/24/13	0	0	0	0
7/25/13	0	0	0	0
7/26/13	0	0	0	0
7/27/13	0	0	0	0
7/28/13	0	0	0	0
7/29/13	0	0	0	0
7/30/13	0	0	0	0
7/31/13	0	0	0	0
8/1/13	0	0	0	0
8/2/13	0	0	0	0
8/3/13	0	0	0	0
8/4/13	0	0	0	0
8/5/13	522	0	0	0
8/6/13	1,985	0	0	0
8/7/13	2,218	0	0	0
8/8/13	2,411	0	0	0
8/9/13	300	0	0	0
8/10/13	0	0	0	0
8/11/13	0	0	0	0
8/12/13	0	0	0	0
8/13/13	0	0	0	0
8/14/13	0	0	0	0
8/15/13	0	0	0	0
8/16/13	0	0	0	0
8/17/13	0	0	0	0
8/18/13	0	0	0	0
8/19/13	0	0	0	0
8/20/13	0	0	0	0
8/21/13	0	0	0	0
8/22/13	0	0	0	0
8/23/13	0	0	0	0
8/24/13	0	0	0	0
8/25/13	0	0	0	0
8/26/13	0	0	0	0
8/27/13	0	0	0	0
8/28/13	0	0	0	0
8/29/13	0	0	0	0
8/30/13	0	0	0	0
8/31/13	0	0	0	0

Merrimack 1

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
9/1/13	0	0	0	0
9/2/13	0	0	0	0
9/3/13	0	0	0	0
9/4/13	0	0	0	0
9/5/13	0	0	0	0
9/6/13	0	0	0	0
9/7/13	0	0	0	0
9/8/13	0	0	0	0
9/9/13	0	0	0	0
9/10/13	0	0	0	0
9/11/13	1,398	0	0	0
9/12/13	2,145	0	0	0
9/13/13	52	0	0	0
9/14/13	0	0	0	0
9/15/13	0	0	0	0
9/16/13	0	0	0	0
9/17/13	0	0	0	0
9/18/13	0	0	0	0
9/19/13	0	0	0	0
9/20/13	0	0	0	0
9/21/13	0	0	0	0
9/22/13	0	0	0	0
9/23/13	0	0	0	0
9/24/13	0	0	0	0
9/25/13	0	0	0	0
9/26/13	0	0	0	0
9/27/13	0	0	0	0
9/28/13	0	0	0	0
9/29/13	0	0	0	0
9/30/13	0	0	0	0
10/1/13	0	0	0	0
10/2/13	0	0	0	0
10/3/13	0	0	0	0
10/4/13	0	0	0	0
10/5/13	0	0	0	0
10/6/13	0	0	0	0
10/7/13	0	0	0	0
10/8/13	0	0	0	0
10/9/13	0	0	0	0
10/10/13	0	0	0	0
10/11/13	0	0	0	0
10/12/13	0	0	0	0
10/13/13	0	0	0	0
10/14/13	0	0	0	0
10/15/13	0	0	0	0
10/16/13	0	0	0	0
10/17/13	0	0	0	0
10/18/13	0	0	0	0
10/19/13	0	0	0	0
10/20/13	0	0	0	0
10/21/13	0	0	0	0
10/22/13	0	0	0	0
10/23/13	0	0	0	0
10/24/13	0	0	0	0
10/25/13	0	0	0	0
10/26/13	0	0	0	0
10/27/13	0	0	0	0
10/28/13	0	0	0	0
10/29/13	0	0	0	0
10/30/13	0	0	0	0
10/31/13	0	0	0	0

Merrimack 1

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
11/1/13	0	0	0	0
11/2/13	0	0	0	0
11/3/13	0	0	0	0
11/4/13	0	0	0	0
11/5/13	0	0	0	0
11/6/13	0	0	0	0
11/7/13	0	0	0	0
11/8/13	0	0	0	0
11/9/13	0	0	0	0
11/10/13	0	0	0	0
11/11/13	0	0	0	0
11/12/13	0	0	0	0
11/13/13	0	0	0	0
11/14/13	0	0	0	0
11/15/13	0	0	0	0
11/16/13	0	0	0	0
11/17/13	0	0	0	0
11/18/13	0	0	0	0
11/19/13	0	0	0	0
11/20/13	0	0	0	0
11/21/13	0	0	0	0
11/22/13	991	0	0	0
11/23/13	2,271	0	0	0
11/24/13	2,415	0	0	0
11/25/13	2,514	0	0	0
11/26/13	2,337	0	0	0
11/27/13	2,235	0	0	0
11/28/13	2,268	0	0	0
11/29/13	2,122	0	0	0
11/30/13	2,379	0	0	0
12/1/13	2,009	0	0	0
12/2/13	2,297	0	0	0
12/3/13	2,017	0	0	0
12/4/13	2,197	0	0	0
12/5/13	2,074	0	0	0
12/6/13	1,946	0	0	0
12/7/13	2,287	0	0	0
12/8/13	2,303	0	0	0
12/9/13	2,488	0	0	0
12/10/13	2,552	0	0	0
12/11/13	2,563	0	0	0
12/12/13	2,624	0	0	0
12/13/13	2,622	0	0	0
12/14/13	2,621	0	0	0
12/15/13	2,610	0	0	0
12/16/13	2,579	0	0	0
12/17/13	2,629	0	0	0
12/18/13	2,625	0	0	0
12/19/13	2,467	0	0	0
12/20/13	2,434	0	0	0
12/21/13	1,957	0	0	0
12/22/13	2,077	0	0	0
12/23/13	2,052	0	0	0
12/24/13	2,365	0	0	0
12/25/13	2,292	0	0	0
12/26/13	2,448	0	0	0
12/27/13	2,600	0	0	0
12/28/13	2,392	0	0	0
12/29/13	2,266	0	0	0
12/30/13	2,131	0	0	0
12/31/13	2,002	0	0	0

Merrimack 2

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
1/1/13	6,910	13	1,035	68,348
1/2/13	7,484	17	899	72,351
1/3/13	7,557	9	837	45,863
1/4/13	7,377	15	1,073	57,111
1/5/13	6,495	10	1,207	52,258
1/6/13	6,691	12	1,043	38,013
1/7/13	6,484	12	1,022	37,488
1/8/13	6,586	11	849	27,564
1/9/13	6,572	6	269	8,234
1/10/13	6,537	7	531	14,809
1/11/13	6,688	7	436	10,815
1/12/13	6,945	8	569	15,846
1/13/13	7,055	10	815	22,680
1/14/13	6,835	11	857	24,125
1/15/13	7,121	11	831	30,441
1/16/13	7,335	20	1,625	81,073
1/17/13	7,392	20	2,519	147,417
1/18/13	7,403	19	1,441	93,706
1/19/13	7,590	22	1,999	127,084
1/20/13	6,990	20	2,092	132,958
1/21/13	7,558	19	1,800	123,525
1/22/13	7,690	18	1,855	201,601
1/23/13	7,734	11	1,051	134,329
1/24/13	7,755	9	768	129,984
1/25/13	7,738	9	836	159,892
1/26/13	7,721	12	1,196	178,617
1/27/13	7,739	11	1,355	216,187
1/28/13	7,711	12	1,173	165,339
1/29/13	7,234	17	1,266	73,144
1/30/13	6,734	10	1,234	43,676
1/31/13	6,658	18	2,252	81,776
2/1/13	7,633	21	3,046	250,004
2/2/13	7,317	21	2,016	285,576
2/3/13	7,318	20	2,013	178,333
2/4/13	7,383	20	2,539	360,044
2/5/13	7,712	20	2,236	224,587
2/6/13	7,678	20	2,647	253,770
2/7/13	7,634	20	2,057	295,207
2/8/13	7,587	13	1,556	127,329
2/9/13	7,599	15	1,656	185,580
2/10/13	7,759	20	2,115	463,124
2/11/13	7,749	20	2,066	378,541
2/12/13	7,682	21	2,955	554,466
2/13/13	7,654	20	3,056	471,808
2/14/13	7,629	22	2,992	286,853
2/15/13	7,571	24	3,140	215,251
2/16/13	7,265	20	2,519	187,582
2/17/13	7,123	11	1,710	114,120
2/18/13	7,655	15	1,247	109,930
2/19/13	7,663	20	1,954	185,158
2/20/13	7,506	20	2,235	173,028
2/21/13	7,741	20	2,311	233,709
2/22/13	7,668	22	2,293	151,697
2/23/13	6,778	12	1,433	58,557
2/24/13	6,812	12	1,564	52,864
2/25/13	6,737	18	1,251	47,806
2/26/13	6,875	19	1,495	62,264
2/27/13	7,232	19	1,844	73,001
2/28/13	6,956	20	2,095	88,482

Merrimack 2

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
3/1/13	6,758	21	2,107	67,559
3/2/13	6,722	21	2,195	68,293
3/3/13	6,851	20	2,270	78,155
3/4/13	7,051	21	2,229	104,049
3/5/13	7,050	20	2,258	99,087
3/6/13	7,392	22	2,760	129,694
3/7/13	7,538	21	2,586	135,562
3/8/13	7,481	24	2,779	151,232
3/9/13	7,050	24	2,871	132,577
3/10/13	6,636	23	2,550	107,210
3/11/13	6,853	21	2,829	120,623
3/12/13	6,840	24	3,137	117,195
3/13/13	6,797	24	3,837	140,067
3/14/13	6,885	24	2,965	164,992
3/15/13	7,493	24	3,577	195,434
3/16/13	6,923	24	3,259	152,168
3/17/13	7,110	24	3,418	153,711
3/18/13	7,063	24	3,071	158,333
3/19/13	7,101	23	3,246	163,778
3/20/13	6,646	23	3,199	212,043
3/21/13	3	0	0	0
3/22/13	0	0	0	0
3/23/13	0	0	0	0
3/24/13	1,427	4	549	25,848
3/25/13	6,891	24	3,514	189,977
3/26/13	6,709	24	3,448	178,312
3/27/13	6,710	24	3,318	126,303
3/28/13	6,711	24	3,440	124,268
3/29/13	6,376	23	3,715	169,089
3/30/13	0	0	0	0
3/31/13	0	0	0	0
4/1/13	0	0	0	0
4/2/13	0	0	0	0
4/3/13	0	0	0	0
4/4/13	0	0	0	0
4/5/13	0	0	0	0
4/6/13	0	0	0	0
4/7/13	0	0	0	0
4/8/13	0	0	0	0
4/9/13	0	0	0	0
4/10/13	0	0	0	0
4/11/13	0	0	0	0
4/12/13	0	0	0	0
4/13/13	0	0	0	0
4/14/13	0	0	0	0
4/15/13	0	0	0	0
4/16/13	0	0	0	0
4/17/13	0	0	0	0
4/18/13	0	0	0	0
4/19/13	0	0	0	0
4/20/13	0	0	0	0
4/21/13	0	0	0	0
4/22/13	0	0	0	0
4/23/13	0	0	0	0
4/24/13	0	0	0	0
4/25/13	0	0	0	0
4/26/13	0	0	0	0
4/27/13	0	0	0	0
4/28/13	0	0	0	0
4/29/13	0	0	0	0
4/30/13	0	0	0	0

Merrimack 2

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
5/1/13	0	0	0	0
5/2/13	0	0	0	0
5/3/13	0	0	0	0
5/4/13	0	0	0	0
5/5/13	0	0	0	0
5/6/13	0	0	0	0
5/7/13	0	0	0	0
5/8/13	0	0	0	0
5/9/13	0	0	0	0
5/10/13	0	0	0	0
5/11/13	0	0	0	0
5/12/13	0	0	0	0
5/13/13	0	0	0	0
5/14/13	0	0	0	0
5/15/13	0	0	0	0
5/16/13	0	0	0	0
5/17/13	0	0	0	0
5/18/13	0	0	0	0
5/19/13	0	0	0	0
5/20/13	0	0	0	0
5/21/13	0	0	0	0
5/22/13	0	0	0	0
5/23/13	0	0	0	0
5/24/13	0	0	0	0
5/25/13	0	0	0	0
5/26/13	0	0	0	0
5/27/13	0	0	0	0
5/28/13	0	0	0	0
5/29/13	0	0	0	0
5/30/13	61	0	0	0
5/31/13	6,814	21	2,561	117,719
6/1/13	6,983	11	1,352	49,344
6/2/13	6,909	12	1,328	44,346
6/3/13	5,860	17	1,452	46,174
6/4/13	5,853	24	3,332	94,021
6/5/13	5,648	23	3,045	76,946
6/6/13	2	0	0	0
6/7/13	0	0	0	0
6/8/13	0	0	0	0
6/9/13	0	0	0	0
6/10/13	0	0	0	0
6/11/13	0	0	0	0
6/12/13	0	0	0	0
6/13/13	0	0	0	0
6/14/13	0	0	0	0
6/15/13	0	0	0	0
6/16/13	0	0	0	0
6/17/13	0	0	0	0
6/18/13	0	0	0	0
6/19/13	0	0	0	0
6/20/13	0	0	0	0
6/21/13	0	0	0	0
6/22/13	0	0	0	0
6/23/13	0	0	0	0
6/24/13	908	1	8	1,484
6/25/13	6,621	8	757	27,604
6/26/13	5,458	7	706	23,250
6/27/13	0	0	0	0
6/28/13	0	0	0	0
6/29/13	0	0	0	0
6/30/13	0	0	0	0

Merrimack 2

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
7/1/13	0	0	0	0
7/2/13	0	0	0	0
7/3/13	0	0	0	0
7/4/13	0	0	0	0
7/5/13	4,788	0	0	0
7/6/13	6,941	7	504	19,839
7/7/13	6,801	8	780	30,756
7/8/13	7,039	12	636	24,804
7/9/13	5,905	15	1,459	51,580
7/10/13	6,562	18	1,848	70,475
7/11/13	6,068	10	1,093	33,774
7/12/13	5,765	13	1,337	37,245
7/13/13	5,595	11	1,423	38,814
7/14/13	6,809	9	964	17,936
7/15/13	6,868	9	431	12,899
7/16/13	7,228	10	677	34,999
7/17/13	6,975	8	339	14,018
7/18/13	7,329	8	355	17,242
7/19/13	7,205	8	533	23,273
7/20/13	6,984	7	295	11,507
7/21/13	5,999	6	748	27,310
7/22/13	6,615	5	136	3,670
7/23/13	5,397	5	196	5,632
7/24/13	0	0	0	0
7/25/13	0	0	0	0
7/26/13	0	0	0	0
7/27/13	0	0	0	0
7/28/13	0	0	0	0
7/29/13	0	0	0	0
7/30/13	0	0	0	0
7/31/13	0	0	0	0
8/1/13	0	0	0	0
8/2/13	0	0	0	0
8/3/13	0	0	0	0
8/4/13	0	0	0	0
8/5/13	162	0	0	0
8/6/13	3,819	8	371	9,209
8/7/13	6,406	18	2,367	59,971
8/8/13	6,993	17	1,699	48,379
8/9/13	310	0	0	0
8/10/13	0	0	0	0
8/11/13	0	0	0	0
8/12/13	0	0	0	0
8/13/13	0	0	0	0
8/14/13	0	0	0	0
8/15/13	0	0	0	0
8/16/13	0	0	0	0
8/17/13	0	0	0	0
8/18/13	0	0	0	0
8/19/13	0	0	0	0
8/20/13	0	0	0	0
8/21/13	0	0	0	0
8/22/13	0	0	0	0
8/23/13	0	0	0	0
8/24/13	0	0	0	0
8/25/13	0	0	0	0
8/26/13	0	0	0	0
8/27/13	0	0	0	0
8/28/13	0	0	0	0
8/29/13	0	0	0	0
8/30/13	0	0	0	0
8/31/13	0	0	0	0

Merrimack 2

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
9/1/13	0	0	0	0
9/2/13	0	0	0	0
9/3/13	0	0	0	0
9/4/13	0	0	0	0
9/5/13	0	0	0	0
9/6/13	0	0	0	0
9/7/13	0	0	0	0
9/8/13	0	0	0	0
9/9/13	0	0	0	0
9/10/13	0	0	0	0
9/11/13	3,258	0	0	0
9/12/13	5,522	12	444	18,509
9/13/13	0	0	0	0
9/14/13	0	0	0	0
9/15/13	0	0	0	0
9/16/13	0	0	0	0
9/17/13	0	0	0	0
9/18/13	0	0	0	0
9/19/13	0	0	0	0
9/20/13	0	0	0	0
9/21/13	0	0	0	0
9/22/13	0	0	0	0
9/23/13	0	0	0	0
9/24/13	0	0	0	0
9/25/13	0	0	0	0
9/26/13	0	0	0	0
9/27/13	0	0	0	0
9/28/13	0	0	0	0
9/29/13	0	0	0	0
9/30/13	0	0	0	0
10/1/13	0	0	0	0
10/2/13	0	0	0	0
10/3/13	0	0	0	0
10/4/13	0	0	0	0
10/5/13	0	0	0	0
10/6/13	0	0	0	0
10/7/13	0	0	0	0
10/8/13	0	0	0	0
10/9/13	0	0	0	0
10/10/13	0	0	0	0
10/11/13	0	0	0	0
10/12/13	0	0	0	0
10/13/13	0	0	0	0
10/14/13	0	0	0	0
10/15/13	0	0	0	0
10/16/13	0	0	0	0
10/17/13	0	0	0	0
10/18/13	0	0	0	0
10/19/13	0	0	0	0
10/20/13	0	0	0	0
10/21/13	0	0	0	0
10/22/13	0	0	0	0
10/23/13	0	0	0	0
10/24/13	0	0	0	0
10/25/13	0	0	0	0
10/26/13	0	0	0	0
10/27/13	0	0	0	0
10/28/13	0	0	0	0
10/29/13	0	0	0	0
10/30/13	0	0	0	0
10/31/13	0	0	0	0

Merrimack 2

	Generation	Generation Surplus to PSNH ES Load		
Date	MWh	Number of Hours	MWh	Revenues - $
11/1/13	0	0	0	0
11/2/13	0	0	0	0
11/3/13	0	0	0	0
11/4/13	0	0	0	0
11/5/13	0	0	0	0
11/6/13	0	0	0	0
11/7/13	0	0	0	0
11/8/13	0	0	0	0
11/9/13	0	0	0	0
11/10/13	0	0	0	0
11/11/13	0	0	0	0
11/12/13	0	0	0	0
11/13/13	0	0	0	0
11/14/13	0	0	0	0
11/15/13	0	0	0	0
11/16/13	0	0	0	0
11/17/13	0	0	0	0
11/18/13	0	0	0	0
11/19/13	0	0	0	0
11/20/13	0	0	0	0
11/21/13	0	0	0	0
11/22/13	0	0	0	0
11/23/13	0	0	0	0
11/24/13	0	0	0	0
11/25/13	0	0	0	0
11/26/13	0	0	0	0
11/27/13	0	0	0	0
11/28/13	0	0	0	0
11/29/13	0	0	0	0
11/30/13	0	0	0	0
12/1/13	0	0	0	0
12/2/13	0	0	0	0
12/3/13	0	0	0	0
12/4/13	0	0	0	0
12/5/13	0	0	0	0
12/6/13	0	0	0	0
12/7/13	2,247	2	11	570
12/8/13	6,412	8	575	31,107
12/9/13	7,228	18	1,768	130,959
12/10/13	7,428	19	1,599	136,421
12/11/13	7,395	19	1,977	253,489
12/12/13	7,761	18	2,205	267,521
12/13/13	7,766	17	1,157	191,339
12/14/13	7,773	10	954	155,915
12/15/13	7,611	11	1,200	194,021
12/16/13	7,500	16	990	176,724
12/17/13	7,764	7	700	109,668
12/18/13	7,755	13	734	96,105
12/19/13	7,388	15	1,150	105,289
12/20/13	7,073	18	1,038	72,225
12/21/13	5,625	8	583	21,986
12/22/13	5,840	9	1,059	26,118
12/23/13	5,677	8	695	12,375
12/24/13	6,609	19	1,548	68,911
12/25/13	6,478	13	729	33,602
12/26/13	7,142	19	1,052	53,917
12/27/13	7,554	19	1,479	94,795
12/28/13	6,802	13	1,496	101,798
12/29/13	77	0	0	0
12/30/13	0	0	0	0
12/31/13	652	1	66	3,165

Newington

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
1/1/13	0	0	0	0
1/2/13	0	0	0	0
1/3/13	1,540	17	1,232	356,490
1/4/13	1,821	19	1,808	463,197
1/5/13	0	0	0	0
1/6/13	0	0	0	0
1/7/13	0	0	0	0
1/8/13	0	0	0	0
1/9/13	0	0	0	0
1/10/13	0	0	0	0
1/11/13	0	0	0	0
1/12/13	0	0	0	0
1/13/13	0	0	0	0
1/14/13	0	0	0	0
1/15/13	0	0	0	0
1/16/13	0	0	0	0
1/17/13	0	0	0	0
1/18/13	0	0	0	0
1/19/13	0	0	0	0
1/20/13	0	0	0	0
1/21/13	0	0	0	0
1/22/13	0	0	0	0
1/23/13	3,126	18	2,813	700,272
1/24/13	5,860	24	5,589	1,185,648
1/25/13	2,621	22	2,491	687,002
1/26/13	0	0	0	0
1/27/13	0	0	0	0
1/28/13	0	0	0	0
1/29/13	2,170	15	1,988	300,108
1/30/13	0	0	0	0
1/31/13	0	0	0	0
2/1/13	0	0	0	0
2/2/13	0	0	0	0
2/3/13	0	0	0	0
2/4/13	1,599	16	1,599	521,307
2/5/13	0	0	0	0
2/6/13	0	0	0	0
2/7/13	1,797	19	1,796	553,731
2/8/13	0	0	0	0
2/9/13	3,015	23	2,986	844,355
2/10/13	5,046	24	5,046	1,312,443
2/11/13	3,596	18	3,586	884,936
2/12/13	2,099	17	2,099	593,519
2/13/13	0	0	0	0
2/14/13	0	0	0	0
2/15/13	0	0	0	0
2/16/13	0	0	0	0
2/17/13	1,042	12	982	379,322
2/18/13	1,609	16	1,540	470,672
2/19/13	0	0	0	0
2/20/13	0	0	0	0
2/21/13	0	0	0	0
2/22/13	0	0	0	0
2/23/13	0	0	0	0
2/24/13	0	0	0	0
2/25/13	0	0	0	0
2/26/13	0	0	0	0
2/27/13	0	0	0	0
2/28/13	0	0	0	0

Newington

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
3/1/13	0	0	0	0
3/2/13	0	0	0	0
3/3/13	0	0	0	0
3/4/13	0	0	0	0
3/5/13	0	0	0	0
3/6/13	0	0	0	0
3/7/13	0	0	0	0
3/8/13	0	0	0	0
3/9/13	0	0	0	0
3/10/13	0	0	0	0
3/11/13	0	0	0	0
3/12/13	0	0	0	0
3/13/13	0	0	0	0
3/14/13	0	0	0	0
3/15/13	0	0	0	0
3/16/13	0	0	0	0
3/17/13	0	0	0	0
3/18/13	0	0	0	0
3/19/13	0	0	0	0
3/20/13	0	0	0	0
3/21/13	1,674	17	1,524	140,262
3/22/13	25	1	1	73
3/23/13	0	0	0	0
3/24/13	0	0	0	0
3/25/13	1,953	17	1,953	260,167
3/26/13	0	0	0	0
3/27/13	0	0	0	0
3/28/13	0	0	0	0
3/29/13	0	0	0	0
3/30/13	0	0	0	0
3/31/13	0	0	0	0
4/1/13	0	0	0	0
4/2/13	0	0	0	0
4/3/13	0	0	0	0
4/4/13	0	0	0	0
4/5/13	0	0	0	0
4/6/13	0	0	0	0
4/7/13	0	0	0	0
4/8/13	0	0	0	0
4/9/13	0	0	0	0
4/10/13	0	0	0	0
4/11/13	0	0	0	0
4/12/13	0	0	0	0
4/13/13	0	0	0	0
4/14/13	0	0	0	0
4/15/13	0	0	0	0
4/16/13	0	0	0	0
4/17/13	0	0	0	0
4/18/13	0	0	0	0
4/19/13	0	0	0	0
4/20/13	0	0	0	0
4/21/13	0	0	0	0
4/22/13	0	0	0	0
4/23/13	0	0	0	0
4/24/13	0	0	0	0
4/25/13	0	0	0	0
4/26/13	0	0	0	0
4/27/13	0	0	0	0
4/28/13	0	0	0	0
4/29/13	0	0	0	0
4/30/13	0	0	0	0

Newington

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
5/1/13	0	0	0	0
5/2/13	0	0	0	0
5/3/13	0	0	0	0
5/4/13	0	0	0	0
5/5/13	0	0	0	0
5/6/13	0	0	0	0
5/7/13	0	0	0	0
5/8/13	0	0	0	0
5/9/13	0	0	0	0
5/10/13	0	0	0	0
5/11/13	0	0	0	0
5/12/13	0	0	0	0
5/13/13	0	0	0	0
5/14/13	0	0	0	0
5/15/13	0	0	0	0
5/16/13	0	0	0	0
5/17/13	0	0	0	0
5/18/13	0	0	0	0
5/19/13	0	0	0	0
5/20/13	0	0	0	0
5/21/13	0	0	0	0
5/22/13	0	0	0	0
5/23/13	0	0	0	0
5/24/13	0	0	0	0
5/25/13	0	0	0	0
5/26/13	0	0	0	0
5/27/13	0	0	0	0
5/28/13	0	0	0	0
5/29/13	0	0	0	0
5/30/13	0	0	0	0
5/31/13	1,242	14	1,242	226,608
6/1/13	934	10	842	210,298
6/2/13	0	0	0	0
6/3/13	0	0	0	0
6/4/13	0	0	0	0
6/5/13	0	0	0	0
6/6/13	0	0	0	0
6/7/13	0	0	0	0
6/8/13	0	0	0	0
6/9/13	0	0	0	0
6/10/13	0	0	0	0
6/11/13	0	0	0	0
6/12/13	0	0	0	0
6/13/13	0	0	0	0
6/14/13	0	0	0	0
6/15/13	0	0	0	0
6/16/13	0	0	0	0
6/17/13	0	0	0	0
6/18/13	0	0	0	0
6/19/13	0	0	0	0
6/20/13	0	0	0	0
6/21/13	0	0	0	0
6/22/13	0	0	0	0
6/23/13	0	0	0	0
6/24/13	0	0	0	0
6/25/13	956	11	454	145,768
6/26/13	0	0	0	0
6/27/13	0	0	0	0
6/28/13	0	0	0	0
6/29/13	0	0	0	0
6/30/13	0	0	0	0

Newington

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
7/1/13	0	0	0	0
7/2/13	0	0	0	0
7/3/13	0	0	0	0
7/4/13	0	0	0	0
7/5/13	2,733	14	2,731	341,029
7/6/13	0	0	0	0
7/7/13	0	0	0	0
7/8/13	0	0	0	0
7/9/13	0	0	0	0
7/10/13	0	0	0	0
7/11/13	0	0	0	0
7/12/13	0	0	0	0
7/13/13	0	0	0	0
7/14/13	0	0	0	0
7/15/13	626	5	78	10,780
7/16/13	1,738	12	796	168,385
7/17/13	2,803	18	1,525	365,447
7/18/13	3,520	23	2,290	541,731
7/19/13	3,538	13	1,754	285,895
7/20/13	1,866	13	633	89,268
7/21/13	0	0	0	0
7/22/13	0	0	0	0
7/23/13	1,024	5	328	52,363
7/24/13	0	0	0	0
7/25/13	0	0	0	0
7/26/13	0	0	0	0
7/27/13	0	0	0	0
7/28/13	0	0	0	0
7/29/13	0	0	0	0
7/30/13	0	0	0	0
7/31/13	0	0	0	0
8/1/13	0	0	0	0
8/2/13	0	0	0	0
8/3/13	0	0	0	0
8/4/13	0	0	0	0
8/5/13	0	0	0	0
8/6/13	0	0	0	0
8/7/13	0	0	0	0
8/8/13	0	0	0	0
8/9/13	0	0	0	0
8/10/13	974	0	0	0
8/11/13	0	0	0	0
8/12/13	0	0	0	0
8/13/13	0	0	0	0
8/14/13	0	0	0	0
8/15/13	0	0	0	0
8/16/13	0	0	0	0
8/17/13	0	0	0	0
8/18/13	0	0	0	0
8/19/13	0	0	0	0
8/20/13	0	0	0	0
8/21/13	4,481	11	1,649	74,951
8/22/13	1,143	0	0	0
8/23/13	0	0	0	0
8/24/13	0	0	0	0
8/25/13	0	0	0	0
8/26/13	0	0	0	0
8/27/13	1,010	0	0	0
8/28/13	0	0	0	0
8/29/13	0	0	0	0
8/30/13	0	0	0	0
8/31/13	0	0	0	0

Newington

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
9/1/13	0	0	0	0
9/2/13	0	0	0	0
9/3/13	0	0	0	0
9/4/13	0	0	0	0
9/5/13	0	0	0	0
9/6/13	0	0	0	0
9/7/13	0	0	0	0
9/8/13	0	0	0	0
9/9/13	0	0	0	0
9/10/13	0	0	0	0
9/11/13	0	0	0	0
9/12/13	983	13	983	162,237
9/13/13	0	0	0	0
9/14/13	0	0	0	0
9/15/13	0	0	0	0
9/16/13	0	0	0	0
9/17/13	0	0	0	0
9/18/13	0	0	0	0
9/19/13	0	0	0	0
9/20/13	0	0	0	0
9/21/13	0	0	0	0
9/22/13	0	0	0	0
9/23/13	0	0	0	0
9/24/13	0	0	0	0
9/25/13	0	0	0	0
9/26/13	0	0	0	0
9/27/13	0	0	0	0
9/28/13	0	0	0	0
9/29/13	0	0	0	0
9/30/13	0	0	0	0
10/1/13	0	0	0	0
10/2/13	0	0	0	0
10/3/13	0	0	0	0
10/4/13	0	0	0	0
10/5/13	0	0	0	0
10/6/13	0	0	0	0
10/7/13	0	0	0	0
10/8/13	0	0	0	0
10/9/13	0	0	0	0
10/10/13	0	0	0	0
10/11/13	0	0	0	0
10/12/13	0	0	0	0
10/13/13	0	0	0	0
10/14/13	0	0	0	0
10/15/13	0	0	0	0
10/16/13	0	0	0	0
10/17/13	0	0	0	0
10/18/13	0	0	0	0
10/19/13	0	0	0	0
10/20/13	0	0	0	0
10/21/13	0	0	0	0
10/22/13	0	0	0	0
10/23/13	0	0	0	0
10/24/13	0	0	0	0
10/25/13	0	0	0	0
10/26/13	0	0	0	0
10/27/13	0	0	0	0
10/28/13	0	0	0	0
10/29/13	0	0	0	0
10/30/13	0	0	0	0
10/31/13	0	0	0	0

Newington

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
11/1/13	0	0	0	0
11/2/13	0	0	0	0
11/3/13	0	0	0	0
11/4/13	0	0	0	0
11/5/13	0	0	0	0
11/6/13	0	0	0	0
11/7/13	0	0	0	0
11/8/13	0	0	0	0
11/9/13	0	0	0	0
11/10/13	0	0	0	0
11/11/13	0	0	0	0
11/12/13	0	0	0	0
11/13/13	0	0	0	0
11/14/13	1,765	6	881	103,092
11/15/13	0	0	0	0
11/16/13	0	0	0	0
11/17/13	0	0	0	0
11/18/13	0	0	0	0
11/19/13	0	0	0	0
11/20/13	0	0	0	0
11/21/13	0	0	0	0
11/22/13	0	0	0	0
11/23/13	0	0	0	0
11/24/13	0	0	0	0
11/25/13	0	0	0	0
11/26/13	0	0	0	0
11/27/13	0	0	0	0
11/28/13	0	0	0	0
11/29/13	0	0	0	0
11/30/13	0	0	0	0
12/1/13	0	0	0	0
12/2/13	0	0	0	0
12/3/13	0	0	0	0
12/4/13	0	0	0	0
12/5/13	0	0	0	0
12/6/13	0	0	0	0
12/7/13	0	0	0	0
12/8/13	0	0	0	0
12/9/13	0	0	0	0
12/10/13	0	0	0	0
12/11/13	0	0	0	0
12/12/13	0	0	0	0
12/13/13	0	0	0	0
12/14/13	0	0	0	0
12/15/13	1,452	13	1,164	379,372
12/16/13	2,817	23	2,634	708,940
12/17/13	2,759	14	2,334	511,415
12/18/13	1,842	14	1,735	406,182
12/19/13	34	1	34	3,584
12/20/13	0	0	0	0
12/21/13	0	0	0	0
12/22/13	0	0	0	0
12/23/13	0	0	0	0
12/24/13	0	0	0	0
12/25/13	0	0	0	0
12/26/13	0	0	0	0
12/27/13	0	0	0	0
12/28/13	0	0	0	0
12/29/13	0	0	0	0
12/30/13	0	0	0	0
12/31/13	0	0	0	0

Schiller 4

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
1/1/13	935	19	703	60,059
1/2/13	975	20	782	79,746
1/3/13	1,031	20	783	57,805
1/4/13	999	22	859	54,756
1/5/13	2	1	2	106
1/6/13	0	0	0	0
1/7/13	0	0	0	0
1/8/13	0	0	0	0
1/9/13	0	0	0	0
1/10/13	0	0	0	0
1/11/13	0	0	0	0
1/12/13	244	1	15	1,863
1/13/13	0	0	0	0
1/14/13	234	4	77	5,265
1/15/13	0	0	0	0
1/16/13	440	13	440	41,431
1/17/13	0	0	0	0
1/18/13	644	17	514	47,766
1/19/13	971	24	971	77,197
1/20/13	755	24	717	58,591
1/21/13	979	21	847	70,517
1/22/13	1,013	21	837	102,764
1/23/13	1,048	20	831	138,932
1/24/13	1,067	20	810	161,749
1/25/13	1,060	21	876	199,373
1/26/13	863	22	717	125,215
1/27/13	1,050	19	687	116,203
1/28/13	976	19	707	115,337
1/29/13	737	18	524	34,333
1/30/13	12	1	12	522
1/31/13	0	0	0	0
2/1/13	749	20	749	105,467
2/2/13	922	24	922	182,578
2/3/13	952	24	884	115,859
2/4/13	925	24	873	168,801
2/5/13	1,045	24	991	120,480
2/6/13	1,024	24	1,009	115,014
2/7/13	992	23	909	153,925
2/8/13	1,022	22	869	108,842
2/9/13	1,004	23	872	156,597
2/10/13	1,088	24	1,011	236,370
2/11/13	1,088	23	984	213,615
2/12/13	1,056	24	1,056	242,590
2/13/13	1,056	24	1,055	192,371
2/14/13	998	24	998	115,906
2/15/13	971	24	971	71,376
2/16/13	856	24	856	86,036
2/17/13	972	21	805	71,279
2/18/13	1,007	21	863	102,174
2/19/13	1,001	24	949	110,457
2/20/13	81	3	81	5,166
2/21/13	0	0	0	0
2/22/13	0	0	0	0
2/23/13	0	0	0	0
2/24/13	0	0	0	0
2/25/13	0	0	0	0
2/26/13	0	0	0	0
2/27/13	0	0	0	0
2/28/13	0	0	0	0

Schiller 4

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
3/1/13	0	0	0	0
3/2/13	0	0	0	0
3/3/13	0	0	0	0
3/4/13	307	11	307	27,630
3/5/13	0	0	0	0
3/6/13	295	10	295	23,104
3/7/13	683	18	675	47,160
3/8/13	921	24	921	59,724
3/9/13	105	4	105	6,814
3/10/13	0	0	0	0
3/11/13	0	0	0	0
3/12/13	0	0	0	0
3/13/13	0	0	0	0
3/14/13	616	20	616	48,974
3/15/13	870	24	870	55,195
3/16/13	3	1	3	152
3/17/13	0	0	0	0
3/18/13	710	21	710	53,303
3/19/13	983	24	964	72,518
3/20/13	965	24	962	74,082
3/21/13	920	0	0	0
3/22/13	844	2	20	1,164
3/23/13	6	0	0	0
3/24/13	0	0	0	0
3/25/13	649	18	649	46,295
3/26/13	0	0	0	0
3/27/13	0	0	0	0
3/28/13	0	0	0	0
3/29/13	0	0	0	0
3/30/13	0	0	0	0
3/31/13	0	0	0	0
4/1/13	0	0	0	0
4/2/13	391	0	0	0
4/3/13	0	0	0	0
4/4/13	0	0	0	0
4/5/13	0	0	0	0
4/6/13	0	0	0	0
4/7/13	0	0	0	0
4/8/13	0	0	0	0
4/9/13	0	0	0	0
4/10/13	0	0	0	0
4/11/13	0	0	0	0
4/12/13	0	0	0	0
4/13/13	0	0	0	0
4/14/13	382	0	0	0
4/15/13	0	0	0	0
4/16/13	336	0	0	0
4/17/13	0	0	0	0
4/18/13	0	0	0	0
4/19/13	0	0	0	0
4/20/13	325	0	0	0
4/21/13	0	0	0	0
4/22/13	229	0	0	0
4/23/13	744	0	0	0
4/24/13	664	0	0	0
4/25/13	6	0	0	0
4/26/13	366	0	0	0
4/27/13	0	0	0	0
4/28/13	250	0	0	0
4/29/13	564	0	0	0
4/30/13	506	0	0	0

Schiller 4

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
5/1/13	647	0	0	0
5/2/13	648	0	0	0
5/3/13	631	0	0	0
5/4/13	0	0	0	0
5/5/13	0	0	0	0
5/6/13	0	0	0	0
5/7/13	0	0	0	0
5/8/13	0	0	0	0
5/9/13	0	0	0	0
5/10/13	0	0	0	0
5/11/13	0	0	0	0
5/12/13	0	0	0	0
5/13/13	0	0	0	0
5/14/13	0	0	0	0
5/15/13	0	0	0	0
5/16/13	635	0	0	0
5/17/13	0	0	0	0
5/18/13	0	0	0	0
5/19/13	0	0	0	0
5/20/13	0	0	0	0
5/21/13	0	0	0	0
5/22/13	0	0	0	0
5/23/13	0	0	0	0
5/24/13	0	0	0	0
5/25/13	0	0	0	0
5/26/13	0	0	0	0
5/27/13	0	0	0	0
5/28/13	0	0	0	0
5/29/13	0	0	0	0
5/30/13	0	0	0	0
5/31/13	387	13	387	32,919
6/1/13	305	4	71	6,025
6/2/13	264	1	13	1,176
6/3/13	0	0	0	0
6/4/13	0	0	0	0
6/5/13	0	0	0	0
6/6/13	0	0	0	0
6/7/13	0	0	0	0
6/8/13	0	0	0	0
6/9/13	0	0	0	0
6/10/13	0	0	0	0
6/11/13	0	0	0	0
6/12/13	0	0	0	0
6/13/13	0	0	0	0
6/14/13	0	0	0	0
6/15/13	0	0	0	0
6/16/13	0	0	0	0
6/17/13	0	0	0	0
6/18/13	0	0	0	0
6/19/13	0	0	0	0
6/20/13	0	0	0	0
6/21/13	0	0	0	0
6/22/13	0	0	0	0
6/23/13	0	0	0	0
6/24/13	515	0	0	0
6/25/13	456	0	0	0
6/26/13	339	0	0	0
6/27/13	0	0	0	0
6/28/13	0	0	0	0
6/29/13	0	0	0	0
6/30/13	0	0	0	0

Schiller 4

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
7/1/13	0	0	0	0
7/2/13	0	0	0	0
7/3/13	0	0	0	0
7/4/13	367	0	0	0
7/5/13	458	0	0	0
7/6/13	443	0	0	0
7/7/13	407	0	0	0
7/8/13	308	9	174	11,666
7/9/13	0	0	0	0
7/10/13	238	8	153	13,364
7/11/13	0	0	0	0
7/12/13	0	0	0	0
7/13/13	0	0	0	0
7/14/13	0	0	0	0
7/15/13	597	4	64	5,065
7/16/13	668	6	130	9,439
7/17/13	700	8	107	6,638
7/18/13	895	11	331	17,996
7/19/13	654	6	113	8,088
7/20/13	363	1	7	375
7/21/13	0	0	0	0
7/22/13	0	0	0	0
7/23/13	0	0	0	0
7/24/13	0	0	0	0
7/25/13	0	0	0	0
7/26/13	0	0	0	0
7/27/13	0	0	0	0
7/28/13	0	0	0	0
7/29/13	0	0	0	0
7/30/13	287	0	0	0
7/31/13	595	0	0	0
8/1/13	462	0	0	0
8/2/13	265	0	0	0
8/3/13	0	0	0	0
8/4/13	0	0	0	0
8/5/13	0	0	0	0
8/6/13	0	0	0	0
8/7/13	0	0	0	0
8/8/13	0	0	0	0
8/9/13	0	0	0	0
8/10/13	0	0	0	0
8/11/13	0	0	0	0
8/12/13	0	0	0	0
8/13/13	0	0	0	0
8/14/13	0	0	0	0
8/15/13	0	0	0	0
8/16/13	0	0	0	0
8/17/13	0	0	0	0
8/18/13	0	0	0	0
8/19/13	0	0	0	0
8/20/13	652	0	0	0
8/21/13	811	0	0	0
8/22/13	836	0	0	0
8/23/13	655	0	0	0
8/24/13	0	0	0	0
8/25/13	0	0	0	0
8/26/13	688	0	0	0
8/27/13	824	0	0	0
8/28/13	0	0	0	0
8/29/13	0	0	0	0
8/30/13	0	0	0	0
8/31/13	0	0	0	0

Schiller 4

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
9/1/13	0	0	0	0
9/2/13	0	0	0	0
9/3/13	0	0	0	0
9/4/13	0	0	0	0
9/5/13	0	0	0	0
9/6/13	0	0	0	0
9/7/13	0	0	0	0
9/8/13	0	0	0	0
9/9/13	0	0	0	0
9/10/13	0	0	0	0
9/11/13	498	0	0	0
9/12/13	356	8	208	18,015
9/13/13	0	0	0	0
9/14/13	0	0	0	0
9/15/13	0	0	0	0
9/16/13	0	0	0	0
9/17/13	0	0	0	0
9/18/13	0	0	0	0
9/19/13	0	0	0	0
9/20/13	0	0	0	0
9/21/13	0	0	0	0
9/22/13	0	0	0	0
9/23/13	0	0	0	0
9/24/13	0	0	0	0
9/25/13	0	0	0	0
9/26/13	0	0	0	0
9/27/13	0	0	0	0
9/28/13	0	0	0	0
9/29/13	0	0	0	0
9/30/13	0	0	0	0
10/1/13	0	0	0	0
10/2/13	0	0	0	0
10/3/13	0	0	0	0
10/4/13	0	0	0	0
10/5/13	0	0	0	0
10/6/13	0	0	0	0
10/7/13	0	0	0	0
10/8/13	0	0	0	0
10/9/13	0	0	0	0
10/10/13	0	0	0	0
10/11/13	0	0	0	0
10/12/13	0	0	0	0
10/13/13	0	0	0	0
10/14/13	0	0	0	0
10/15/13	0	0	0	0
10/16/13	0	0	0	0
10/17/13	0	0	0	0
10/18/13	0	0	0	0
10/19/13	0	0	0	0
10/20/13	0	0	0	0
10/21/13	0	0	0	0
10/22/13	0	0	0	0
10/23/13	0	0	0	0
10/24/13	0	0	0	0
10/25/13	0	0	0	0
10/26/13	0	0	0	0
10/27/13	0	0	0	0
10/28/13	0	0	0	0
10/29/13	0	0	0	0
10/30/13	0	0	0	0
10/31/13	0	0	0	0

Schiller 4

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
11/1/13	0	0	0	0
11/2/13	0	0	0	0
11/3/13	0	0	0	0
11/4/13	0	0	0	0
11/5/13	0	0	0	0
11/6/13	0	0	0	0
11/7/13	0	0	0	0
11/8/13	0	0	0	0
11/9/13	0	0	0	0
11/10/13	0	0	0	0
11/11/13	0	0	0	0
11/12/13	0	0	0	0
11/13/13	676	0	0	0
11/14/13	6	0	0	0
11/15/13	0	0	0	0
11/16/13	0	0	0	0
11/17/13	0	0	0	0
11/18/13	0	0	0	0
11/19/13	0	0	0	0
11/20/13	0	0	0	0
11/21/13	0	0	0	0
11/22/13	0	0	0	0
11/23/13	597	0	0	0
11/24/13	942	0	0	0
11/25/13	1,017	0	0	0
11/26/13	868	0	0	0
11/27/13	736	0	0	0
11/28/13	619	1	6	211
11/29/13	748	0	0	0
11/30/13	768	0	0	0
12/1/13	708	0	0	0
12/2/13	727	0	0	0
12/3/13	751	0	0	0
12/4/13	7	0	0	0
12/5/13	0	0	0	0
12/6/13	0	0	0	0
12/7/13	9	1	9	298
12/8/13	679	16	352	24,845
12/9/13	935	24	865	67,887
12/10/13	967	22	847	95,123
12/11/13	1,004	24	958	146,022
12/12/13	1,065	20	888	128,016
12/13/13	1,059	21	880	161,308
12/14/13	1,046	19	695	122,732
12/15/13	989	18	627	110,029
12/16/13	961	20	736	158,180
12/17/13	1,050	18	763	134,396
12/18/13	1,048	21	855	133,729
12/19/13	948	22	761	77,056
12/20/13	941	24	901	73,850
12/21/13	9	1	9	357
12/22/13	0	0	0	0
12/23/13	0	0	0	0
12/24/13	597	17	544	41,348
12/25/13	776	24	695	41,582
12/26/13	935	22	812	49,457
12/27/13	967	24	885	68,122
12/28/13	864	15	587	44,301
12/29/13	859	0	0	0
12/30/13	738	0	0	0
12/31/13	997	1	31	4,670

Schiller 6

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
1/1/13	934	17	551	45,999
1/2/13	974	18	696	69,710
1/3/13	1,036	17	607	42,370
1/4/13	986	19	700	43,342
1/5/13	2	1	2	67
1/6/13	257	0	0	0
1/7/13	246	3	57	4,145
1/8/13	1	1	1	35
1/9/13	228	1	22	1,460
1/10/13	0	0	0	0
1/11/13	254	1	7	238
1/12/13	323	0	0	0
1/13/13	0	0	0	0
1/14/13	246	3	73	5,603
1/15/13	242	3	21	1,465
1/16/13	417	12	417	40,022
1/17/13	0	0	0	0
1/18/13	672	15	504	45,951
1/19/13	980	24	912	70,301
1/20/13	736	21	612	47,711
1/21/13	983	21	773	63,963
1/22/13	1,035	20	814	99,145
1/23/13	1,069	18	717	116,315
1/24/13	1,083	14	540	101,225
1/25/13	1,080	18	583	122,020
1/26/13	1,053	20	658	108,373
1/27/13	446	10	427	70,708
1/28/13	0	0	0	0
1/29/13	0	0	0	0
1/30/13	0	0	0	0
1/31/13	0	0	0	0
2/1/13	735	19	693	96,539
2/2/13	916	24	835	161,704
2/3/13	963	22	845	106,646
2/4/13	921	21	769	145,041
2/5/13	1,057	21	909	105,332
2/6/13	1,029	23	911	98,425
2/7/13	990	21	821	134,148
2/8/13	1,023	19	769	93,251
2/9/13	1,011	21	753	126,252
2/10/13	1,090	21	925	213,514
2/11/13	1,089	21	929	199,060
2/12/13	1,068	24	1,002	222,083
2/13/13	1,055	23	970	172,274
2/14/13	988	24	932	106,272
2/15/13	961	24	961	70,332
2/16/13	866	24	817	80,167
2/17/13	984	16	515	41,626
2/18/13	1,034	20	818	96,235
2/19/13	1,000	21	853	96,237
2/20/13	894	21	737	69,671
2/21/13	1,043	22	884	101,612
2/22/13	994	24	933	66,654
2/23/13	11	1	11	402
2/24/13	0	0	0	0
2/25/13	0	0	0	0
2/26/13	0	0	0	0
2/27/13	0	0	0	0
2/28/13	0	0	0	0

Schiller 6

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
3/1/13	0	0	0	0
3/2/13	0	0	0	0
3/3/13	0	0	0	0
3/4/13	305	11	226	19,107
3/5/13	573	17	497	26,038
3/6/13	303	10	244	17,918
3/7/13	698	17	618	42,876
3/8/13	908	24	908	58,197
3/9/13	131	5	131	8,310
3/10/13	0	0	0	0
3/11/13	0	0	0	0
3/12/13	0	0	0	0
3/13/13	0	0	0	0
3/14/13	0	0	0	0
3/15/13	0	0	0	0
3/16/13	0	0	0	0
3/17/13	0	0	0	0
3/18/13	0	0	0	0
3/19/13	0	0	0	0
3/20/13	0	0	0	0
3/21/13	0	0	0	0
3/22/13	0	0	0	0
3/23/13	0	0	0	0
3/24/13	0	0	0	0
3/25/13	0	0	0	0
3/26/13	0	0	0	0
3/27/13	0	0	0	0
3/28/13	0	0	0	0
3/29/13	0	0	0	0
3/30/13	0	0	0	0
3/31/13	0	0	0	0
4/1/13	0	0	0	0
4/2/13	0	0	0	0
4/3/13	0	0	0	0
4/4/13	0	0	0	0
4/5/13	0	0	0	0
4/6/13	0	0	0	0
4/7/13	0	0	0	0
4/8/13	0	0	0	0
4/9/13	0	0	0	0
4/10/13	12	0	0	0
4/11/13	246	0	0	0
4/12/13	308	0	0	0
4/13/13	0	0	0	0
4/14/13	450	0	0	0
4/15/13	0	0	0	0
4/16/13	504	0	0	0
4/17/13	0	0	0	0
4/18/13	0	0	0	0
4/19/13	0	0	0	0
4/20/13	0	0	0	0
4/21/13	0	0	0	0
4/22/13	0	0	0	0
4/23/13	0	0	0	0
4/24/13	528	0	0	0
4/25/13	14	0	0	0
4/26/13	441	0	0	0
4/27/13	0	0	0	0
4/28/13	127	0	0	0
4/29/13	325	0	0	0
4/30/13	464	0	0	0

Schiller 6

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
5/1/13	651	0	0	0
5/2/13	627	0	0	0
5/3/13	0	0	0	0
5/4/13	0	0	0	0
5/5/13	0	0	0	0
5/6/13	0	0	0	0
5/7/13	0	0	0	0
5/8/13	0	0	0	0
5/9/13	0	0	0	0
5/10/13	0	0	0	0
5/11/13	0	0	0	0
5/12/13	0	0	0	0
5/13/13	0	0	0	0
5/14/13	0	0	0	0
5/15/13	0	0	0	0
5/16/13	0	0	0	0
5/17/13	0	0	0	0
5/18/13	0	0	0	0
5/19/13	0	0	0	0
5/20/13	0	0	0	0
5/21/13	0	0	0	0
5/22/13	0	0	0	0
5/23/13	0	0	0	0
5/24/13	0	0	0	0
5/25/13	0	0	0	0
5/26/13	0	0	0	0
5/27/13	0	0	0	0
5/28/13	0	0	0	0
5/29/13	0	0	0	0
5/30/13	417	0	0	0
5/31/13	484	15	470	35,839
6/1/13	409	3	42	3,163
6/2/13	283	0	0	0
6/3/13	0	0	0	0
6/4/13	0	0	0	0
6/5/13	0	0	0	0
6/6/13	0	0	0	0
6/7/13	0	0	0	0
6/8/13	0	0	0	0
6/9/13	0	0	0	0
6/10/13	0	0	0	0
6/11/13	0	0	0	0
6/12/13	0	0	0	0
6/13/13	0	0	0	0
6/14/13	0	0	0	0
6/15/13	0	0	0	0
6/16/13	0	0	0	0
6/17/13	0	0	0	0
6/18/13	0	0	0	0
6/19/13	0	0	0	0
6/20/13	0	0	0	0
6/21/13	0	0	0	0
6/22/13	0	0	0	0
6/23/13	0	0	0	0
6/24/13	446	0	0	0
6/25/13	465	0	0	0
6/26/13	464	0	0	0
6/27/13	0	0	0	0
6/28/13	0	0	0	0
6/29/13	0	0	0	0
6/30/13	0	0	0	0

Schiller 6

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
7/1/13	0	0	0	0
7/2/13	0	0	0	0
7/3/13	0	0	0	0
7/4/13	349	0	0	0
7/5/13	423	0	0	0
7/6/13	377	0	0	0
7/7/13	415	0	0	0
7/8/13	360	0	0	0
7/9/13	0	0	0	0
7/10/13	0	0	0	0
7/11/13	0	0	0	0
7/12/13	0	0	0	0
7/13/13	0	0	0	0
7/14/13	0	0	0	0
7/15/13	557	0	0	0
7/16/13	662	3	81	5,660
7/17/13	865	8	217	9,931
7/18/13	919	10	273	13,986
7/19/13	653	3	29	1,802
7/20/13	677	7	190	9,096
7/21/13	0	0	0	0
7/22/13	0	0	0	0
7/23/13	0	0	0	0
7/24/13	0	0	0	0
7/25/13	0	0	0	0
7/26/13	0	0	0	0
7/27/13	0	0	0	0
7/28/13	0	0	0	0
7/29/13	0	0	0	0
7/30/13	0	0	0	0
7/31/13	0	0	0	0
8/1/13	0	0	0	0
8/2/13	0	0	0	0
8/3/13	0	0	0	0
8/4/13	0	0	0	0
8/5/13	231	0	0	0
8/6/13	482	8	296	9,731
8/7/13	278	9	278	9,262
8/8/13	0	0	0	0
8/9/13	0	0	0	0
8/10/13	0	0	0	0
8/11/13	0	0	0	0
8/12/13	0	0	0	0
8/13/13	0	0	0	0
8/14/13	0	0	0	0
8/15/13	0	0	0	0
8/16/13	0	0	0	0
8/17/13	0	0	0	0
8/18/13	0	0	0	0
8/19/13	0	0	0	0
8/20/13	0	0	0	0
8/21/13	0	0	0	0
8/22/13	0	0	0	0
8/23/13	0	0	0	0
8/24/13	0	0	0	0
8/25/13	0	0	0	0
8/26/13	0	0	0	0
8/27/13	0	0	0	0
8/28/13	0	0	0	0
8/29/13	0	0	0	0
8/30/13	0	0	0	0
8/31/13	0	0	0	0

Schiller 6

Date	Generation MWh	Generation Surplus to PSNH ES Load Number of Hours	MWh	Revenues - $
9/1/13	0	0	0	0
9/2/13	0	0	0	0
9/3/13	0	0	0	0
9/4/13	0	0	0	0
9/5/13	0	0	0	0
9/6/13	0	0	0	0
9/7/13	0	0	0	0
9/8/13	0	0	0	0
9/9/13	0	0	0	0
9/10/13	0	0	0	0
9/11/13	548	0	0	0
9/12/13	359	6	210	18,117
9/13/13	0	0	0	0
9/14/13	0	0	0	0
9/15/13	0	0	0	0
9/16/13	0	0	0	0
9/17/13	0	0	0	0
9/18/13	0	0	0	0
9/19/13	0	0	0	0
9/20/13	0	0	0	0
9/21/13	0	0	0	0
9/22/13	0	0	0	0
9/23/13	0	0	0	0
9/24/13	0	0	0	0
9/25/13	0	0	0	0
9/26/13	0	0	0	0
9/27/13	0	0	0	0
9/28/13	0	0	0	0
9/29/13	0	0	0	0
9/30/13	0	0	0	0
10/1/13	0	0	0	0
10/2/13	0	0	0	0
10/3/13	0	0	0	0
10/4/13	0	0	0	0
10/5/13	0	0	0	0
10/6/13	0	0	0	0
10/7/13	0	0	0	0
10/8/13	0	0	0	0
10/9/13	0	0	0	0
10/10/13	0	0	0	0
10/11/13	0	0	0	0
10/12/13	0	0	0	0
10/13/13	0	0	0	0
10/14/13	0	0	0	0
10/15/13	0	0	0	0
10/16/13	0	0	0	0
10/17/13	0	0	0	0
10/18/13	0	0	0	0
10/19/13	0	0	0	0
10/20/13	0	0	0	0
10/21/13	328	0	0	0
10/22/13	330	0	0	0
10/23/13	0	0	0	0
10/24/13	0	0	0	0
10/25/13	0	0	0	0
10/26/13	0	0	0	0
10/27/13	0	0	0	0
10/28/13	0	0	0	0
10/29/13	0	0	0	0
10/30/13	0	0	0	0
10/31/13	0	0	0	0

Schiller 6

Date	Generation MWh	Generation Surplus to PSNH ES Load: Number of Hours	MWh	Revenues - $
11/1/13	0	0	0	0
11/2/13	0	0	0	0
11/3/13	0	0	0	0
11/4/13	0	0	0	0
11/5/13	0	0	0	0
11/6/13	0	0	0	0
11/7/13	0	0	0	0
11/8/13	0	0	0	0
11/9/13	0	0	0	0
11/10/13	0	0	0	0
11/11/13	0	0	0	0
11/12/13	0	0	0	0
11/13/13	652	0	0	0
11/14/13	23	0	0	0
11/15/13	0	0	0	0
11/16/13	0	0	0	0
11/17/13	0	0	0	0
11/18/13	0	0	0	0
11/19/13	0	0	0	0
11/20/13	0	0	0	0
11/21/13	0	0	0	0
11/22/13	0	0	0	0
11/23/13	560	0	0	0
11/24/13	927	0	0	0
11/25/13	1,017	0	0	0
11/26/13	862	0	0	0
11/27/13	733	0	0	0
11/28/13	626	0	0	0
11/29/13	756	0	0	0
11/30/13	807	0	0	0
12/1/13	698	0	0	0
12/2/13	686	0	0	0
12/3/13	727	0	0	0
12/4/13	8	0	0	0
12/5/13	0	0	0	0
12/6/13	0	0	0	0
12/7/13	0	0	0	0
12/8/13	437	4	75	5,120
12/9/13	922	21	761	57,938
12/10/13	976	21	774	84,844
12/11/13	994	21	815	119,609
12/12/13	1,063	20	826	117,300
12/13/13	1,055	19	790	143,693
12/14/13	1,042	10	428	71,966
12/15/13	976	13	487	82,859
12/16/13	944	18	644	138,216
12/17/13	1,046	12	375	61,500
12/18/13	1,038	19	728	111,190
12/19/13	930	17	612	61,479
12/20/13	906	21	718	58,737
12/21/13	38	3	38	2,136
12/22/13	0	0	0	0
12/23/13	0	0	0	0
12/24/13	460	15	390	29,682
12/25/13	724	17	454	25,301
12/26/13	921	20	712	41,957
12/27/13	959	21	773	56,692
12/28/13	605	12	492	40,099
12/29/13	0	0	0	0
12/30/13	0	0	0	0
12/31/13	452	1	28	5,336

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014 | **Date of Response: 09/19/2014**
Request No. CLF 2-005 | **Page 1 of 6**
Request from: Conservation Law Foundation

Witness: William H. Smagula, Frederick White

Request:
Reference PSNH response to CLF 1-005, pages 2-31. Please provide a total, by generation unit, of all positive values in the "above-market costs" column (not net of the negative values), broken down by the associated listed reason for dispatch. For all instances of positive "above-market costs" noted on these schedules, please elaborate more specifically on the reason for dispatch.

Response:
Please see the attached tables for the requested information.

The tables are summarized by Dispatch Period (contiguous periods of operation during which there is never more than one day between generating days), then by positive and negative Above-Market Energy Cost categories (within each dispatch period), and then by Reasons for Dispatch along with Additional Information. Above-Market Energy Cost dollars from CLF 1-005 are subtotaled for every sub-period and for every dispatch period. Also shown are annual subtotals of positive and negative above-market energy cost.

Merrimack 1

Dispatch Period	Positive Above-Market Energy Cost	Reason for Dispatch	Additional Information	Above-Market Energy Cost - $	Dispatch Period Subtotals
1/1 - 1/8	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Jan).	40,985	
1/1 - 1/8	No	Self-scheduled for load.		(347,911)	(306,927)
1/16 - 3/29	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Jan).	16,085	
1/16 - 3/29	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Feb).	45,457	
1/16 - 3/29	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (early Mar).	74,450	
1/16 - 3/29	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during volatile price transition from winter period (mid-Mar).	59,101	
1/16 - 3/29	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during volatile price transition from winter period (late Mar).	48,788	
1/16 - 3/29	No	Dispatched by ISO-NE for load.		(33,323)	
1/16 - 3/29	No	Self-scheduled for load.		(7,457,454)	
1/16 - 3/29	No	Self-scheduled for environmental testing (mercury/PM) & load.		(326,576)	
1/16 - 3/29	No	Self-scheduled for environmental testing (RATA) & load.		(384,362)	
1/16 - 3/29	No	Self-scheduled for VAR testing & load.		(18,745)	(7,976,580)
4/2 - 4/4	No	Dispatched by ISO-NE for load.		(51,497)	(51,497)
5/30 - 6/5	Yes	Self-scheduled based on market price volatility & for load.	Shakedown run to test repairs & prepare for peak summer period.	117,592	
5/30 - 6/5	Yes	Self-scheduled for ISO-NE capability audit & load.		9,449	
5/30 - 6/5	No	Dispatched by ISO-NE for load.		(34,947)	
5/30 - 6/5	No	Self-scheduled for load.		(27,063)	65,031
6/24 - 6/27	Yes	Self-scheduled for load.	Came off-line, end of run.	1,163	
6/24 - 6/27	No	Dispatched by ISO-NE for load.		(56,467)	
6/24 - 6/27	No	Self-scheduled for load.		(13,465)	(68,769)
7/5 - 7/21	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak summer period (Jul).	94,397	
7/5 - 7/21	Yes	Self-scheduled for environmental testing (RATA) & load.		12,846	
7/5 - 7/21	No	Dispatched by ISO-NE for load.		(19,994)	
7/5 - 7/21	No	Self-scheduled for load.		(525,652)	
7/5 - 7/21	No	Self-scheduled for environmental testing (RATA/mercury/PM) & load.		(109,142)	(547,546)
8/5 - 8/9	Yes	Self-scheduled for Clean Air Project testing & load.		85,190	
8/5 - 8/9	Yes	Self-scheduled for Clean Air Project & VAR testing, & load.		44,533	129,723
9/11 - 9/13	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	1,085	
9/11 - 9/13	No	Dispatched by ISO-NE for load.		(84,813)	(83,729)
11/22 - 12/31	Yes	Self-scheduled for load.	Come online for peak early-winter period (late Nov).	9,489	
11/22 - 12/31	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Dec).	134,352	
11/22 - 12/31	No	Self-scheduled for load.		(3,900,991)	
11/22 - 12/31	No	Self-scheduled for ISO-NE capability audit & load.		(246,045)	(4,003,196)
Total				(12,843,489)	(12,843,489)
			Subtotal - Positive Above-Market Energy Cost	794,960	
			Subtotal - Negative Above-Market Energy Cost	(13,638,449)	

Merrimack 2

Dispatch Period	Positive Above-Market Energy Cost	Reason for Dispatch	Additional Information	Above-Market Energy Cost - $	Dispatch Period Subtotals
1/1 - 3/29	Yes	Self-scheduled for reliable operations (high pressure heater) & load.	Stay online during peak winter period (Jan).	1,198,032	
1/1 - 3/29	Yes	Self-scheduled for reliable operations (high pressure heater) & load.	Stay online during peak winter period (Feb).	346,810	
1/1 - 3/29	Yes	Self-scheduled for reliable operations (high pressure heater) & load.	Stay online during peak winter period (early Mar).	427,416	
1/1 - 3/29	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during volatile price transition from winter period (mid-Mar).	468,514	
1/1 - 3/29	Yes	Self-scheduled for reliable operations (test repairs) & load.	Return to service after 2-day outage.	244,517	
1/1 - 3/29	No	Self-scheduled for environmental testing (mercury/PM) & load.		(918,402)	
1/1 - 3/29	No	Self-scheduled for environmental testing (RATA) & load.		(2,336,951)	
1/1 - 3/29	No	Self-scheduled for load.		(19,290,388)	
1/1 - 3/29	No	Self-scheduled for reliable operations (test repairs) & load.	Return to service after 2-day outage.	(36,452)	
1/1 - 3/29	No	Self-scheduled for VAR testing & load.		(24,140)	(19,921,044)
5/30 - 6/6	Yes	Self-scheduled for reliable operations (post-maint. testing) & load.	Shakedown run to test repairs & prepare for peak summer period.	499,703	
5/30 - 6/6	No	Self-scheduled for reliable operations (post-maint. testing) & load.	Shakedown run to test repairs & prepare for peak summer period.	(39,584)	460,119
6/24 - 6/26	No	Dispatched by ISO-NE for load.		(101,775)	
6/24 - 6/26	No	Self-scheduled for load.		(75,334)	(177,109)
7/5 - 7/23	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak summer period (Jul).	443,165	
7/5 - 7/23	Yes	Self-scheduled for environmental testing (RATA) & load.		74,485	
7/5 - 7/23	Yes	Self-scheduled for load.	Stay online during peak summer period (Jul).	99,197	
7/5 - 7/23	No	Dispatched by ISO-NE for load.		(66,435)	
7/5 - 7/23	No	Self-scheduled for environmental testing (RATA/mercury/PM) & load.		(284,751)	
7/5 - 7/23	No	Self-scheduled for ISO-NE capability audit & load.		(23,322)	
7/5 - 7/23	No	Self-scheduled for load.		(1,274,448)	
7/5 - 7/23	No	Self-scheduled for VAR testing & load.		(58,202)	(1,090,311)
8/5 - 8/9	Yes	Self-scheduled for Clean Air Project testing & load.		389,875	389,875
9/11 - 9/12	Yes	Dispatched by ISO-NE for load.	Operational issues (derate), generation fell short of DA committment.	22,327	
9/11 - 9/12	Yes	Self-scheduled for reliable operations & load.	Online for minimum run time.	48,996	71,323
12/7 - 12/31	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Dec).	289,833	
12/7 - 12/31	Yes	Self-scheduled for load.	Come online during peak winter period (Dec).	31,690	
12/7 - 12/31	Yes	Self-scheduled for load.	Outage, generation fell short of DA committment.	97,660	
12/7 - 12/31	No	Self-scheduled for load.		(9,223,733)	(8,804,549)
Total				(29,071,694)	(29,071,694)
			Subtotal - Positive Above-Market Energy Cost	4,682,222	
			Subtotal - Negative Above-Market Energy Cost	(33,753,916)	

Newington

Dispatch Period	Positive Above-Market Energy Cost	Reason for Dispatch	Additional Information	Above-Market Energy Cost - $	Dispatch Period Subtotals
1/3 - 1/4	No	Dispatched by ISO-NE for reliability & load.		(528,860)	(528,860)
1/23 - 1/25	No	Dispatched by ISO-NE for reliability & load.		(448,072)	
1/23 - 1/25	No	Self-scheduled based on market price volatility, reliable op's, & for load.		(1,278,390)	(1,726,461)
1/29 - 1/29	No	Dispatched by ISO-NE for reliability & load.		(30,003)	(30,003)
2/4 - 2/4	No	Dispatched by ISO-NE for reliability & load.		(215,155)	(215,155)
2/7 - 2/12	No	Dispatched by ISO-NE for reliability & load.		(2,777,520)	(2,777,520)
2/17 - 2/18	No	Dispatched by ISO-NE for reliability & load.		(187,199)	(187,199)
3/21 - 3/22	Yes	Self-scheduled for load.	Unit self-scheduled even though bilateral purchase made to cover MK2 outage and serve load.	174,061	
3/21 - 3/22	Yes	Self-scheduled for load.	Came off-line, end of run.	3,639	177,700
3/25 - 3/25	No	Dispatched by ISO-NE for reliability & load.		(25,320)	(25,320)
5/31 - 6/1	No	Dispatched by ISO-NE for reliability & load.		(32,193)	(32,193)
6/25 - 6/25	Yes	Dispatched by ISO-NE for reliability & load.		8,234	8,234
7/5 - 7/5	No	Dispatched by ISO-NE for reliability & load.		(48,173)	(48,173)
7/15 - 7/20	Yes	Dispatched by ISO-NE for reliability & load.	Trouble with fuel injection valve. Sporadic operations; only achieved 78 MW.	40,901	
7/15 - 7/20	No	Dispatched by ISO-NE for reliability & load.		(698,446)	(657,545)
7/23 - 7/23	No	Dispatched by ISO-NE for reliability & load.		(28,685)	(28,685)
8/10 - 8/10	No	Dispatched by ISO-NE for reliability & load.		(31,678)	(31,678)
8/21 - 8/22	Yes	Self-scheduled for ISO-NE capability audit, VAR testing, & load.		368,270	
8/21 - 8/22	No	Dispatched by ISO-NE for reliability & load.		(18,408)	349,861
8/27 - 8/27	No	Dispatched by ISO-NE for reliability & load.		(40,678)	(40,678)
9/12 - 9/12	No	Dispatched by ISO-NE for reliability & load.		(31,569)	(31,569)
11/14 - 11/14	Yes	Self-scheduled for Winter Reliability Program & load.	NCPC compensation based on ISO-NE reference prices, not actual fuel cost.	61,469	61,469
12/15 - 12/19	Yes	Dispatched by ISO-NE for reliability & load.	Came off-line, end of run.	3,735	
12/15 - 12/19	No	Dispatched by ISO-NE for reliability & load.		(288,753)	(285,018)
Total				(6,048,794)	(6,048,794)
			Subtotal - Positive Above-Market Energy Cost	660,308	
			Subtotal - Negative Above-Market Energy Cost	(6,709,102)	

Schiller 4

Dispatch Period	Positive Above-Market Energy Cost	Reason for Dispatch	Additional Information	Above-Market Energy Cost - $	Dispatch Period Subtotals
1/1 - 1/5	Yes	Self-scheduled for load.	Came off-line, end of run.	34	
1/1 - 1/5	No	Self-scheduled for load.		(114,764)	(114,730)
1/12 - 2/20	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	166	
1/12 - 2/20	No	Dispatched by ISO-NE for load.		(2,143,056)	
1/12 - 2/20	No	Self-scheduled for load.		(694,809)	(2,837,698)
3/4 - 3/9	No	Dispatched by ISO-NE for load.		(31,496)	(31,496)
3/14 - 3/25	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	110	
3/14 - 3/25	No	Dispatched by ISO-NE for load.		(113,346)	(113,236)
4/2 - 4/2	No	Dispatched by ISO-NE for load.		(11,151)	(11,151)
4/14 - 4/16	No	Dispatched by ISO-NE for load.		(16,741)	(16,741)
4/20 - 5/3	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	67	
4/20 - 5/3	No	Dispatched by ISO-NE for load.		(92,220)	(92,152)
5/16 - 5/16	Yes	Self-scheduled for mercury testing & load.		7,449	7,449
5/31 - 6/2	No	Dispatched by ISO-NE for load.		(26,705)	(26,705)
6/24 - 6/26	No	Dispatched by ISO-NE for load.		(61,453)	(61,453)
7/4 - 7/10	No	Dispatched by ISO-NE for load.		(53,229)	(53,229)
7/15 - 7/20	No	Dispatched by ISO-NE for load & ISO-NE capability audit.		(17,412)	
7/15 - 7/20	No	Dispatched by ISO-NE for load.		(184,561)	(201,973)
7/30 - 8/2	Yes	Self-scheduled for environmental (RATA) testing & load.		33,405	33,405
8/20 - 8/23	Yes	Self-scheduled for operational (DSI) & VAR testing, & load.		9,119	
8/20 - 8/23	Yes	Self-scheduled for operational (DSI) testing & load.		29,645	38,764
8/26 - 8/27	Yes	Self-scheduled for operational (DSI) testing & load.		12,963	12,963
9/11 - 9/12	No	Dispatched by ISO-NE for load.		(25,734)	(25,734)
11/13 - 11/14	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	143	
11/13 - 11/14	No	Dispatched by ISO-NE for load.		(13,673)	(13,530)
11/23 - 12/4	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Dec).	11,482	
11/23 - 12/4	Yes	Self-scheduled for load.	Came off-line, end of run.	177	
11/23 - 12/4	No	Dispatched by ISO-NE for load.		(39,177)	
11/23 - 12/4	No	Self-scheduled for load.		(77,632)	(105,150)
12/7 - 12/21	Yes	Dispatched by ISO-NE for load.	Came on-line in hour 24.	219	
12/7 - 12/21	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	134	
12/7 - 12/21	No	Dispatched by ISO-NE for load.		(1,194,094)	(1,193,741)
12/24 - 12/31	No	Dispatched by ISO-NE for load.		(202,589)	
12/24 - 12/31	No	Self-scheduled for load.		(9,500)	(212,089)
Total				(5,018,227)	(5,018,227)
			Subtotal - Positive Above-Market Energy Cost	105,114	
			Subtotal - Negative Above-Market Energy Cost	(5,123,342)	

Schiller 6

Dispatch Period	Positive Above-Market Energy Cost	Reason for Dispatch	Additional Information	Above-Market Energy Cost - $	Dispatch Period Subtotals
1/1 -1/27	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	34	
1/1 -1/27	No	Dispatched by ISO-NE for load.		(373,928)	
1/1 -1/27	No	Self-scheduled for load.		(699,822)	(1,073,716)
2/1 - 2/23	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	191	
2/1 - 2/23	No	Dispatched by ISO-NE for load.		(2,010,595)	(2,010,403)
3/4 - 3/9	Yes	Self-scheduled for VAR testing & load.		382	
3/4 - 3/9	No	Dispatched by ISO-NE for load.		(38,981)	(38,599)
4/10 - 4/16	Yes	Dispatched by ISO-NE for load, however unit trip.	2 unit trips impact economics over 3 days.	5,268	
4/10 - 4/16	No	Dispatched by ISO-NE for load.		(17,117)	(11,849)
4/24 - 5/2	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	98	
4/24 - 5/2	No	Dispatched by ISO-NE for load.		(78,209)	(78,111)
5/30 - 6/2	No	Dispatched by ISO-NE for load.		(41,865)	(41,865)
6/24 - 6/26	No	Dispatched by ISO-NE for load & ISO-NE capability audit.		(8,795)	
6/24 - 6/26	No	Dispatched by ISO-NE for load.		(55,638)	(64,433)
7/4 - 7/8	No	Dispatched by ISO-NE for load.		(54,626)	(54,626)
7/15 - 7/20	No	Dispatched by ISO-NE for load & VAR testing.		(48,898)	
7/15 - 7/20	No	Dispatched by ISO-NE for load.		(164,902)	(213,800)
8/5 - 8/7	Yes	Self-scheduled for environmental testing (RATA) & load.		19,600	19,600
9/11 - 9/12	No	Dispatched by ISO-NE for load.		(31,104)	(31,104)
10/21 - 10/22	Yes	Dispatched by ISO-NE for load.		2,089	
10/21 - 10/22	No	Dispatched by ISO-NE for load.		(2,710)	(621)
11/13 - 11/14	No	Dispatched by ISO-NE for load.		(17,393)	(17,393)
11/23 - 12/4	Yes	Dispatched by ISO-NE for load.	Came off-line, end of run.	193	
11/23 - 12/4	Yes	Self-scheduled based on market price volatility, reliable op's, & for load.	Stay online during peak winter period (Dec).	7,741	
11/23 - 12/4	No	Dispatched by ISO-NE for load.		(48,784)	
11/23 - 12/4	No	Self-scheduled for load.		(96,812)	(137,661)
12/8 - 12/21	No	Dispatched by ISO-NE for load.		(1,230,172)	(1,230,172)
12/24 - 12/31	Yes	Dispatched by ISO-NE for load.	Outage, generation fell short of DA committment.	8,724	
12/24 - 12/31	No	Dispatched by ISO-NE for load.		(129,181)	
12/24 - 12/31	No	Self-scheduled for load.		(15,115)	(135,572)
Total				(5,120,325)	(5,120,325)
			Subtotal - Positive Above-Market Energy Cost	44,322	
			Subtotal - Negative Above-Market Energy Cost	(5,164,647)	

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014
Request No. CLF 2-006
Request from: **Conservation Law Foundation**

Date of Response: 09/19/2014
Page 1 of 1

Witness: **William H. Smagula, Frederick White**

Request:
Reference PSNH response to CLF 1-005, pages 2-31. Please explain which categories of PSNH generation unit costs are and are not included in the calculation of "above-market costs." For those costs not included in the calculation, please provide the average daily amounts of such costs in 2013 for each of the listed generating units.

Response:

The calculation does not include "fixed costs"; such as fossil/hydro O&M, depreciation, taxes, and return on rate base. Refer to PSNH's May 1, 2014 filing, Attachment MLS-3 (Bates 12 and 13), lines 30 and 31; and MLS-4, pages 12 and 13 (Bates 36 and 37) for information on these costs. Additional information by station can also be found in Staff 1-007 and CLF 1-001 in this docket. Average daily amounts by station can easily be derived from these figures. Note also that the calculation does not include revenues from the capacity market, which does not vary based on generation amounts, and ancillary markets, the bulk of which do not vary with generation.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014 **Date of Response: 09/19/2014**
Request No. CLF 2-007 **Page 1 of 2**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Reference PSNH response to CLF 1-007, page 2. Please provide the same information with respect to the NWPP.

Response:
Please see the attached table.

NWPP Schiller 5 - Capacity Market Revenues - $(000)

Schiller 5

Year	Month	Capacity Auction Revenues	Adjustments PER	Adjustments Availability	Net Capacity Revenue
2013	1	116	0	0	116
	2	116	(1)	0	115
	3	116	(1)	0	115
	4	116	(1)	0	115
	5	116	(1)	0	115
	6	110	(1)	0	110
	7	110	(1)	0	110
	8	110	(3)	0	107
	9	110	(3)	0	107
	10	110	(3)	0	107
	11	110	(3)	0	107
	12	110	(3)	9	116
Total		1,350	(19)	9	1,340

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Date Request Received: 08/12/2014 **Date of Response: 09/19/2014**
Request No. CLF 2-008 **Page 1 of 2**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Reference PSNH response to CLF 1-007, page 2. Please explain how the adjustments for "PER" and "Availability" are calculated. Please also explain specifically the reason for the adjustment for availability ($569,000 in December 2013) at Newington Station.

Response:
Peak Energy Rent (PER):
Reference ISO-NE Market Rule 1; Section III.13.7.2.7.1.1.
PER is a capacity payment adjustment reflecting revenues in the energy market during high priced hours. Energy revenues above a "strike price" are calculated on an hourly basis; based on a heat rate of 22,000 Btu/kWh and the higher of No. 2 oil or natural gas, a load scaling factor, and an assumed 95% availability factor. These results are summarized by month, and flow thru settlement as a rolling 12-month average downward adjustment to monthly forward capacity market revenues. Calculation details are outlined in the ISO-NE rules identified above.

Availability:
Reference ISO-NE Market Rule 1; Sections III.13.7.1.1, III.13.7.2.7.1.2, and Appendix A.
Forward capacity market payments are adjusted based on a resource's availability during a shortage event. Shortage events reflect a shortage of operating reserves, which is defined as 30 or more consecutive minutes of reserve constraint penalty factor activation. A resource's shortage event availability score is based on hourly availabilities, calculated as available MW during the hour as a percentage of the resource's capacity supply obligation (CSO) MW. Hourly availabilities are also subject to offer competitiveness reviews and offer price mitigation. Hourly availabilities are weighted over the entire shortage event based on the portion of the shortage event occurring during each hour. Monthly capacity revenues are reduced based on the availability score, a penalty factor (percentage) based on the duration of the shortage event, and "annualized" capacity revenues based on the monthly payment rate and CSO MW. Calculation details are outlined in the ISO-NE rules identified above.

On Saturday, December 14, 2013 a Shortage Event occurred on the ISO-NE system; it was the first instance of a Shortage Event occurring since the forward capacity market rules were implemented. ISO-NE experienced curtailments from neighboring systems (approx. 700 MW), loads above forecast (approx. 630 MW), and generator outages (approx. 400 MW), leading to the shortage event. Simultaneous transmission system maintenance also resulted in constrained area conditions around Newington. Based on the rules identified above, including competitive offer review and offer price mitigation, Newington received a shortage event availability score of zero during the 85 minute duration event. As a result, Newington's forward capacity market revenues for December, 2013 were reduced by $568,526; 5% of Newington's annualized revenues of $11,370,519.

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Date Request Received: 08/12/2014 **Date of Response: 09/19/2014**
Request No. CLF 2-009 **Page 1 of 1**
Request from: Conservation Law Foundation

Witness: Frederick White

Request:
Reference PSNH response to CLF 1-009, page 2. Please provide a version of this schedule that separately lists capacity and energy revenues.

Response:

The revenue figures on page 2 of CLF 1-009 are energy revenues only (exclusive of NCPC revenues). Capacity revenues are provided in CLF 1-007 and CLF 2-007.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014
Request No. CLF 2-010
Request from: **Conservation Law Foundation**

Date of Response: 09/19/2014
Page 1 of 1

Witness: **William H. Smagula**

Request:
Reference PSNH response to CLF 1-0010. Please provide a detailed breakdown of the referenced Schiller Station field testing costs associated with MATS compliance options and the dates those costs were incurred. Please provide whatever additional detail is available regarding the "compliance review and planning" costs that are "reflected in O&M totals," by generating unit or station as applicable.

Response:
As stated in CLF 01-010, Schiller Station completed field testing in 2013 to assess compliance options. These costs were included in the station's O&M budget and were approximately $258,000 with a breakdown as shown below. The testing was conducted the week of August 19.

Description	Cost ($000)
DSI Test services	172.1
Stack Testing	66.5
Coal/Ash Sample analysis	9.7
Station Labor - test support	6.5
Vacuum Services	2.8
	257.6

The costs associated with Generation's environmental personnel performing compliance review and planning are not tracked uniquely and therefore no additional detail is available.

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Docket No. DE 14-120

Date Request Received: 08/12/2014 **Date of Response: 09/19/2014**
Request No. CLF 2-011 **Page 1 of 1**
Request from: Conservation Law Foundation

Witness: Michael L. Shelnitz

Request:
Reference PSNH response to CLF 1-0011. Do PSNH energy service costs included in this reconciliation include any costs associated with negotiating a potential power purchase agreement for energy to be delivered through the proposed Northern Pass project or other activities related to the Northern Pass project? If yes, please provide an accounting of and specific activities for such costs.

Response:
The PSNH Energy Service costs do include costs associated with negotiating a potential power purchase agreement with Hydro Quebec for the benefit of Energy Service customers , however, these costs are not uniquely tracked on a project specific basis, and PSNH would not be able to calculate precisely how much of the costs charged to the PSNH Energy Service segment are directly associated with these specific power purchase agreement negotiations, as opposed to any other potential power purchase agreement. While the 2013 PSNH Energy Service costs include some costs associated with negotiating a potential power purchase agreement with Hydro Quebec for energy to be delivered through the proposed Northern Pass Transmission project for the benefit of PSNH Energy Service customers, the treatment of those negotiation costs as not being uniquely tracked is consistent with the treatment of other power purchase agreements negotiated in the past on behalf of PSNH Energy Service customers such as those for Burgess Biomass and Lempster Wind.

No costs associated with the development of the proposed Northern Pass Transmission project have been charged to the PSNH Energy Service segment. All costs associated with the development of the Northern Pass Transmission project have been charged to an accounting unit that is specific to Northern Pass Transmission LLC.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014 **Date of Response: 09/19/2014**
Request No. CLF 2-012 **Page 1 of 1**
Request from: Conservation Law Foundation

Witness: Michael L. Shelnitz

Request:
Reference PSNH response to CLF 1-0011 and Letter from Steven Mullen to Debra Howland, dated Nov. 5, 2013 (http://www.puc.nh.gov/11-05-13%20Report%20-%20Sen%20Forrester%20Inquiries%20re%20PSNH%20and%20Northern%20Pass.pdf), page 5. The referenced letter quotes a PSNH data response as follows:

> Until 2013, Gary Long's activities relating to the Northern Pass project primarily involved negotiations regarding an economic power purchase agreement that would benefit PSNH's customer base. Therefore, that time was not charged to Northern Pass. In 2013, through the end of Mr. Long's term as President of PSNH, ten percent of Mr. Long's time is deemed to be on behalf of Northern Pass. The allocation of costs of Mr. Long's salary will be accomplished via appropriate accounting journal entries which have not yet occurred.

With respect to PSNH Presidents Long and Quinlan, please provide (a) a summary of any PSNH energy service costs associated with 2013 time involving "negotiations regarding an economic power purchase agreement" related to Northern Pass and (b) a description of the allocation of the PSNH Presidents' salary costs (and any other PSNH officers' salary costs similarly split) among PSNH energy service, Northern Pass, and other sources for 2013.

Response:
(a) PSNH has no accounting record of time spent for PSNH Presidents Long and Quinlan specifically relating to negotiations regarding an economic power purchase agreement relating to the Northern Pass Transmission project being charged to PSNH energy service costs in 2013. Any time spent on such negotiations, similar to any other PPA negotiations with other entities, was not uniquely tracked.

(b) please refer to CLF-1-12 for the allocation of all executive compensation included in the 2013 PSNH energy service costs. In 2013, while acting as PSNH Presidents, approximately 10 percent of President Long's time was charged to the Northern Pass Transmission project and approximately 30 percent of President Quinlan's time was charged to the Northern Pass Transmission project. As noted by the Commission's General Counsel in a letter dated July 18, 2014 in Docket IR 14-196, the Commission Staff has confirmed that the allocation of Mr. Long's salary as referenced in Mr. Mullen's letter, and quoted in this request, did occur.

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 08/12/2014 | **Date of Response: 09/19/2014**
Request No. CLF 2-013 | **Page 1 of 3**
Request from: Conservation Law Foundation

Witness: Michael L. Shelnitz

Request:
Reference PSNH response to Staff 1-004. Please provide unit volumes of fuel delivered by month for each generation station.

Response:
Please see the attached.

Merrimack Station
2013 Monthly Unit Volumes

	Coal Delivered Tons	#2 Oil Delivered Gallons
January	66,106	12,510
February	60,515	9,508
March	69,416	7,001
April	68,502	12,007
May	69,435	8,001
June	34,432	5,004
July	16,663	8,007
August	66,964	7,500
September	60,567	11,508
October	8,045	-
November	17,401	5,506
December	50,162	12,507

Newington Station
2013 Monthly Unit Volumes

	#2 Oil Delivered Gallons	Gas Delivered MCFs	#6 Oil Delivered Gallons
January	90,008	27,703	2,699,807
February	90,013	36,828	-
March	19,999	53,183	1,461,237
April	-	-	-
May	-	19,991	-
June	-	-	-
July	39,995	107,642	-
August	30,007	81,082	4,446,099
September	20,001	16,257	-
October	-	-	-
November	20,001	7,358	2,124,155
December	80,002	-	-

Schiller Station
2013 Monthly Unit Volumes

	Coal Delivered Tons	Wood Delivered Tons	Gas Delivered MCFs
January	49,671	57,633	751
February	-	43,772	98
March	13,194	40,741	150
April	-	13,545	240
May	-	43,360	1,803
June	36,395	50,708	138
July	-	49,113	658
August	-	50,468	66
September	-	38,169	227
October	-	45,111	70
November	39,297	44,702	523
December	-	54,364	344

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 12/18/2014 **Date of Response: 01/12/2015**
Request No. TS 1-001 **Page 1 of 2**
Request from: New Hampshire Public Utilities Commission Staff

Witness: William H. Smagula, Frederick White

Request:
Reference the response to OCA 1-16. Please explain further the increased generation at the hydro units referenced in this response.

Response:
It was noted in OCA 1-16 that PSNH Hydro generated 363,838 MWh in 2013. This was ~10% greater than 2012 generation (see staff 1-017) and 7% above the long term average. Each facility produced more megawatt-hours in 2013 than 2012, primarily due to heavy precipitation and record generation in April, June and July which was somewhat offset by below average precipitation in quarter 4.

While this increased generation is consistent with the higher precipitation levels, it also reflects well planned maintenance and operation to maximize water flows when available. To that point, Hydro pro-actively managed transformer replacements at the Amoskeag and Ayers Island facilities.

At Amoskeag, while one transformer was out of service, the second station transformer remained in service and resulted in generation as shown below for the months of September through December.

Amoskeag Hydro	Actual Monthly Generation (MWH)	Reduced Generation (estimate) associated with transformer maintenance (MWH)
September	5,862	1,175
October	3,150	0
November	4,353	720
December	5,761	825
Sub-total	19,126	2,720
% of Facility Generation	20.4%	2.9%
Annual Total	93,685	

At Ayers Island, during the scheduled replacement of the generator start-up transformer a mobile sub-station was installed which allowed generation as shown below for the months of November and December.

Ayers Island Hydro	Actual Monthly Generation (MWH)	Reduced Generation (estimate) associated with transformer maintenance (MWH)
November	3,410	475
December	3,189	365
Sub-total	6,599	840
% of Facility Generation	14%	1.8%
Annual Total	46,695	

Public Service Company of New Hampshire
Docket No. DE 14-120

Date Request Received: 12/18/2014 | **Date of Response: 01/12/2015**
Request No. TS 1-002 | **Page 1 of 1**
Request from: **New Hampshire Public Utilities Commission Staff**

Witness: **William H. Smagula, Frederick White**

Request:
Reference the response to CLF 1-5, page 27. Please explain further the "unit trip" issues affecting Schiller unit 6 on April 10, 11, and 12, 2013.

Response:
Below is a chronology of the Schiller Unit 6 events on April 10, 11 and 12.

April 10 -- Planned outage ended when the unit phased at 7:58 PM. Note that this planned outage began on March 10 to replace the Unit 6 control system.
April 10 -- Unit tripped at 10:02 PM. This was the initial start up with the new control system. The logic was reviewed and it appeared the system and equipment performed as expected. Further investigation would be completed during the subsequent start-up. The unit remained off-line through the night with a start-up planned for 7:00 AM the next morning.
April 11-- 7:00 AM Unit start-up for additional testing and tuning of the control system. The unit tripped at 7:49 AM. Further investigation with the additional information from a second start-up identified a tuning adjustment was necessary to better synchronize the load and fuel inputs. The unit was returned to service at 8:20 AM and ran through 8:00 PM to perform routine testing of the new control system and logic.
April 12-- 7:00 AM Second and final day of testing and tuning of the control system and logic. The unit was operated between 7:00 AM and 8:00 PM to complete necessary checks. The unit did not trip; it was removed from service and available for dispatch by ISO. This completed the control system commissioning.

The unit only tripped on April 10 at 10:02 PM and April 11 at 7:49 AM, as noted above. The unit was removed from service at 8:00 PM on both April 11 and April 12 when testing for the new control system was complete for the day.