STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 10-121

In The Matter of

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
2009 ENERGY SERVICE AND STRANDED COST RECOVERY CHARGE RECONCILIATION

DIRECT TESTIMONY

of

Michael D. Cannata, Jr., P. E.
Senior Consultant
ACCION GROUP, INC.

November 23, 2010

Q. Mr. Cannata, please state your full name.

A. My name is Michael D. Cannata, Jr.

Q. Please state your employer and your business address.

A. For this engagement, I am engaged by The Accion Group (Accion) to address the issues raised in this proceeding. My business address is 65A Ridge Road, Deerfield, New Hampshire 03037.

Q. In what capacity are you employed?

A. I am generally responsible for the review of energy utility engineering and operations management, practices, and procedures.

Q. Please describe your educational background, work experience, and major accomplishments of your professional career?

A. My educational background, work experience, and major career accomplishments are presented in Exhibit MDC-1.

Q. To what professional organizations or industry groups do you belong or have you belonged?

A. I am a member of the Institute of Electrical and Electronic Engineers and its Power Engineering Society, and am a Registered Professional Engineer in the State of New Hampshire (#5618). I served as a member of virtually all of the former New England

Power Pool (NEPOOL) Task Forces and Committees except for their Executive Committee, where my role was supportive to an Executive Committee member. I also served as a member of the New England/Hydro Quebec DC Interconnection Task Force and the Hydro Quebec Phase Two Advisory Committee. These two groups designed the Hydro Quebec Phase One and Phase Two 450kV DC interconnections with New England. The various committees and groups that I have served on existed to address the functions now being performed by the Independent System Operator – New England (ISO-NE).

On national issues, I represented Public Service Company of New Hampshire (PSNH) at the Northeast Power Coordinating Council as its Joint Coordinating Committee member, at the Edison Electric Institute as its System Planning Committee member, and at the Electric Power Research Institute as a member of the Power Systems Planning and Operations Task Force.

While employed by the of the State of New Hampshire, I managed a professional staff engaged in investigations regarding safety, operations, reliability, emergency planning, and the implementation of public policy in the electric, gas, telecommunications, and water industries. I also sat as a full member of the New Hampshire Site Evaluation Committee responsible for siting major energy facilities (Generating stations, gas transmission lines, electric transmission lines, and gas storage facilities). At the request of the New Hampshire Public Utilities Commission's (NHPUC or Commission) Chairman, I sat on the State Emergency

Response Commission as a designated member. I was also a member of the former Staff Subcommittee on Engineering of the National Association of Regulatory Utility Commissioners.

Q. Have you testified before regulatory bodies before?

A. I have testified before the NHPUC in rate case, condemnation, least cost planning, fuel adjustment, electric industry restructuring, unit outage reviews. I have testified before the Kentucky Public Service Commission and the Maine Public Utilities Commission in transmission siting proceedings, and have submitted testimony at proceedings at the Federal Energy Regulatory Commission (FERC). I have also testified at the request of the Commission before Committees of the New Hampshire Legislature on a variety of matters concerning regulated utilities.

Q. Please describe the areas that your testimony addresses today.

A. My testimony addresses three main areas and other lesser issues. Accion was requested to review (1) the market-based capacity/energy transactions performed by PSNH that augmented its own generation to supply 2009 Energy Service to PSNH customers, (2) the outages that occurred at all PSNH generating units during 2009, and (3) the review of PSNH's efforts to address the twelve additional recommendations contained in the Stipulation and Settlement Agreement in Docket 09-091 in Sections IIA and IIID. I also present my views regarding the adequacy of the PSNH computerized information system data base used to track generation outage and cause data, the availability and capacity factors, heat rates of PSNH generating units for 2009, and the adequacy of future capital and O&M expenditures for reliable and efficient plant operations.

This testimony addresses the review areas either through the questions and answers presented below, or through a series of individual reports, which are attached as exhibits to my testimony and are organized as follows.

Capacity/Energy Transactions:

Exhibit MDC-2, 2009 Capacity/Energy Transactions

Generating Unit Outages:

Exhibit MDC-3, Merrimack Outages for 2009 (Without MK-2 Turbine Repair Outage)

Exhibit MDC-3A – Merrimack Turbine Repair Outage

Exhibit MDC-4, Newington Outages For 2009

Exhibit MDC-5, Schiller Unit Outages For 2009

Exhibit MDC-6, Hydroelectric Unit Outages For 2009

Exhibit MDC-7, Combustion Turbine Outages For 2009

Exhibit MDC-8, W. F. Wyman Outages for 2009

Exhibit MDC-9, Stipulation Items from the 2008 Energy Service/Stranded Cost recovery Review (Docket DE 09-091)

Q. Please summarize your capacity and energy transaction testimony.

A. With regard to capacity and energy transactions, Accion concluded that the PSNH filing is an accurate representation of the capacity and energy purchasing process that took place in 2009, and that PSNH made sound and prudent management decisions with regard to its capacity and energy purchases in its market environment consistent with its Least Cost Plan as modified on March 28, 2008. However, Accion believes that improvements can be made in the supplemental energy and capacity purchase process. PSNH made little or no sales of excess energy and capacity once energy or capacity was purchased, except into the spot market. Accion reviewed the capacity and energy testimony filed by PSNH, conducted an on-site interview with knowledgeable personnel responsible for the capacity and energy transaction function at PSNH, requested follow-up information, and reviewed detailed, backup information of the summary results supplied by PSNH. Accion also concluded that the capacity factor projections for PSNH units used for 2009 market purchases were reasonable and included ongoing discussions with generating plant personnel. In addition, Accion concluded that the volume of customer migration in 2009 introduced volatility and difficulty into supplying future PSNH customer energy service needs, because of the inability to adjust purchases in a timely manner for unknown customer decisions.

Q. Do you have recommendations regarding capacity and energy transaction issues?

A. Yes. PSNH used a longer forward-looking supplemental energy purchase philosophy in 2009 when it saw forward-looking energy prices rising for 2009, and purchased much of its energy and capacity needs by July 2008. As a result of the financial crisis in the fall of 2008, energy prices tumbled, stayed very low through 2009, triggering an extensive migration of load from the PSNH system. These longer term purchases resulted in substantial costs to customers because of circumstances beyond PSNH's control. Energy prices remain low at this time and Accion believes that they will remain low in the near-term, absent major world events.

Accion recommends that while market prices are depressed due to the factors enumerated above, PSNH focus more on shorter term arrangements and spot market prices during the two non-peak quarters. To provide some hedge against market fluctuations during the two peak period quarters and to reduce the possibility of large quantities of excess power, Accion recommends PSNH should establish a percentage of its on-peak monthly needs that will be procured from supplemental sources with an established point of measurement, such as an approved load forecast. Also, Accion recommends that PSNH have a clearly defined basis for making short-term purchases or sales that fall outside projected needs.

The PSNH load forecasting model, as all load forecasting models do, uses lagging economic data. Lagging economic data can result in over prediction of load in deteriorating economic conditions and under prediction of load in improving economic conditions. Accion believes both economic trends can disadvantage customers. Accion recommends that, in its quarterly review, PSNH should formally factor the lagging impact of the econometric input on the load forecast into its supplemental energy purchase decision making process.

Accion recommends that PSNH explicitly and formally factor reserve shut-downs into its projection of operation of its units in determining supplemental energy needs, or confirm that it explicitly and formally does so[1]. If reserve shut-downs are projected for its base load units, the between planned outage capacity factor should be adjusted to reflect those reductions, similar to the manner done for the short reliability unit outages.

PSNH generally only sells its purchased surplus supplemental energy into the spot market, as opposed to longer term markets to avoid the risk of making incorrect decisions. Accion sees that action as inconsistent with how PSNH deals with its purchases. PSNH buys energy it believes is required to meet its load serving obligations and is subject to a prudence review after-the-fact. Accion believes the selling of surplus supplemental energy is the same process that would also be subject to a prudence review. Accion recommends that PSNH analyze its purchases and make sales of surplus energy and capacity into markets other than the spot market as it deems appropriate. PSNH would be subject to a prudence review of its sales and/or its decision not to enter into such sales.

Q. Please state the results of your review of the PSNH unit outages that occurred during 2009.

A. With regard to planned and forced unit outages, Accion found that the base load units on the PSNH system ran well in 2009. In fact, PSNH units generally performed as

[1] Accion recommends this item as it is not sure from its review that NU performs this task as NU stated that it treated all base load units as running all the time.

well or better than forecasted. Such output is of note because, over time, unit operation has become more complicated, or unit output has been reduced, by factors such as (1) increased safety requirements dealing with confined spaces; (2) the addition of spray modules in the outlet canal at Merrimack; (3) the self-imposed reduction of the operating level of Unit 2 at Merrimack to reduce the likelihood of full load trips to maintain the unit's reliability; (4) the installation of supplemental electrostatic precipitators and SCRs on both units at Merrimack; and (5) the use of low sulfur coal to comply with state and federal environmental regulations.

Accion reviewed outage information, conducted on-site interviews, and submitted follow-up requests for information as necessary. In each instance, except those noted below, Accion found the outages to be reasonable and not unexpected for the particular unit, its vintage, or that the outage was necessary for proper operation of the unit. Accion also concluded that PSNH conducted proper planning and management oversight regarding these planned and forced unit outages. Additionally, from its review of unit outages, Accion has recommendations it believes will support and elevate PSNH efforts in achieving additional improvement in unit operation.

Q. Which outages did you find unreasonable?

A. Accion found some PSNH unit outages to be unreasonable and they are noted below. Accion also lists outages below which it found reasonable, but where circumstances presented an opportunity for PSNH to improve its processes. Accion will first present its findings with regard to unreasonable outages.

The first outage Accion believes to be unreasonable is associated with Jackman Outage 1-A on 3/27/09, as identified in Exhibit MDC–6. This planned outage was taken to verify wiring and contact arrangement information for the design of protection circuits for the installation of the replacement TB-9 step-up transformer. This outage would not have been required but for the failure of TB-9 in 2008, due to contractor action where the NHPUC declined to allow PSNH to recover costs. Accion recommends replacement power costs related to this outage is not recovered.

The next outage Accion believes to be unreasonable also relates to Jackman. It is the planned outage taken on 12/1/09 for 9.29 days to install the new TB-9 step-up transformer, identified as Jackman Outage 1-C in Exhibit MDC-6. This outage would not have been required but for the failure of TB-9 in 2008, due to contractor action where the NHPUC declined to allow PSNH to recover costs. Accion recommends replacement power costs related to this outage is not recovered.

PSNH performed its annual inspection of this unit during Outage 1-C and the annual inspection outage would have been taken regardless of the TB-9 transformer replacement. Accion further recommends that the normal inspection outage time of approximately four days is deducted from the length of Outage-C in determination of the replacement power costs.

The next outage Accion finds to be unreasonable was an 115kV line trip that resulted in the trip of all three units at Ayers Island. The outage occurred on 6/19/09 and the unit outages are identified as Ayers Island Outage 1-C, Ayers Island Outage 2-B, and Ayers Island Outage 3-C in Exhibit MDC-6. This outage took place due to multiple breakdowns of PSNH's vegetation management process when dealing with line sections dealing with wetland areas. The section of the line where the contact occurred was related to wetlands and became deferred work in 2007, when the remainder of the line had vegetation management performed. The deferred work was supposed to be done in the winter of 2007/2008 when the ground was frozen. The deferred work was not performed in the winter of 2007/2008, was still assumed to be deferred work in the 2008 patrol, and not reported to PSNH in the 2009 patrol by the PSNH contractor just prior to the incident. PSNH foresters are responsible for the integration and coordination of all vegetation maintenance requirements on a prescribed schedule for each line. PSNH has a coordinated vegetation management plan to ensure that the entire right-of-way for a line is completed on schedule, and to follow up on uncompleted work. Such oversight was not exercised here. Accion recommends replacement power costs associated with these outages is not recovered from customers.

The next outage that Accion finds unreasonable occurred on 10/14/09, and is identified as Gorham Outage 3-F in Exhibit MDC-6. The hydro operator called the Electric-System Control Center (E-SCC) at least fifteen minutes prior to the start of work and informed them that false by-pass flow indications might be received. The

E-SCC did not pass this information on in a timely manner to the remaining dispatchers and, as a result, incorrect action was taken by the dispatcher after a false alarm was received by the dispatcher. Accion believes insufficient dispatcher attention was given to this situation and that replacement power costs should not be recovered from customers.

The next outages Accion believes are unreasonable occurred at W. F. Wyman #4 station on 1/24/09, 2/6/09, and 8/11/09, and are identified as Wyman Outage 4-B, Wyman Outage 4-D, and Wyman Outage 4-I, respectively in Exhibit MDC-8. Nextera[2] classified all these outages as operator error. Outage 4-B occurred when the operator did not follow established procedure by skipping a step in the procedure. Outage 4-D occurred when the operator did not follow procedure and mispositioned valves. Outage 4-I occurred when, against procedure, the operator attempted repeated starts of a burner pair. Although operator error was stated as the direct cause, Accion finds that operator attention, operator awareness, operator understanding of procedures, and operator lack of understanding that procedures must be followed, all contributed to the causes of these outages. Nextera also rotates its operators throughout its system between the hydro and fossil facilities. Accion believes Nextera does so to familiarize its operators with all units for purpose of manpower flexibility. Accion believes all of these issues relate to training adequacy of the operators involved during the rotation process. Accion recommends the replacement power costs associated with these outages not be passed on to customers.

Q. Is that the extent of the outages that you find to be unreasonable?

A. Yes, it is.

Q. How should the replacement power costs of the outages you believe to be unreasonable be quantified?

A. PSNH has consistently used a method to quantify replacement power costs in recent Energy Service/Stranded Cost Recovery Charge reviews. I recommend they continue to use that methodology for these outages.

Q. In addition to your recommendations regarding the recovery of outage costs, you mentioned that you have recommendations that you believe will support and elevate PSNH's efforts in achieving additional improvement in unit operation. Please present those recommendations.

A. Certainly. First, let me clarify that while Accion found all the following referenced outages reasonable and recommends the recovery of all costs related to those outages, they do present circumstances from which PSNH may be able to improve operating proficiency and, thus, lower costs to customers. The first additional recommendation relates to the outage for the repair of the Merrimack 2 HP/IP turbine, and is described in detail in Exhibit MDC-3A. There were three repairs performed on the start-up boiler feed pump. Two of those repairs were the result of Siemens workmanship issues. PSNH was reimbursed for time and material costs related to two out of the three repairs to the start-up boiler feed pump because one repair was unrelated to Siemens workmanship issues. PSNH's insurance policy covered the replacement

[2] Nextera purchased the majority share of W. F. Wyman from Florida Power and Light, the previous owner.

power costs for any extension of the HP/IP repair outage resulting from the problems with the start-up boiler feed pump.

Accion understands that discussions have taken place between PSNH and Siemens regarding Siemens' workmanship issues. Accion recommends that PSNH file a report with the Commission within one month after the issuance of a final order in this docket describing the efforts taken, and results achieved in addressing Siemens' workmanship issues, so similar issues can be avoided going forward.

The next outages that suggest performance can be improved involved outages identified as Schiller Outage 4-D, Schiller Outage 5-D, and Schiller Outage 6-F in Exhibit MDC-5, and occurred from 7/18/09 through 7/21/09. These outages are at a multi-unit station and are interrelated by the overall market energy price and PSNH actions. With low market energy prices, PSNH manages overtime and tries to perform all work on a straight time basis to reduce costs. The process is complicated by some units which traditionally operated as base load units that are now, at times, operating in a reserve shut-down status. When viewed from a single unit basis, impacts which may be financially beneficial from the one unit viewpoint may present economic challenges from the viewpoint of another unit in the station. Accion believes these events created that tension because the required repair of one unit was different from the straight time repair of another unit. Accion recommends that PSNH review its policy and practices regarding overtime expenditures versus reserve shutdown, on a unit-by-unit basis and between units at all of its major stations, to ensure that units are in an operational state that maximizes customer benefits.

The next outage suggesting performance can be improved relates to Schiller Outage 6-H in Exhibit MDC-5, occurring on 6/18/09. In this outage, a tube leak tripped the unit ten days prior to its eighteen-month scheduled overhaul. PSNH made an abbreviated repair because it was not ready to begin the overhaul that far in advance. While Accion believes that PSNH made the correct decision in this case, Accion also believes that there are many considerations that must be made in order to make the decision to start a planned outage early. Some of these considerations are; (1) contractor availability; (2) material availability; (3) market price; (4)cause of the outage; (5) time between the outage and the planned outage; (6) status of other economical units; (7) day of the week the outage occurs; and (8) the ability to gain ISO-NE approval for the schedule change. In addition, each unit has its own characteristics that can influence how early a planned outage can be started, such as start-up and shut-down times. Once a decision is made to start an outage early, PSNH should be in a position that maximizes its ability to start an outage early if that is the correct decision for the conditions presented in that outage. If not, outage time may be increased and, therefore, costs increased to customers. Because of unit differences, Accion believes that the amount of time that a planned outage could be started early varies by unit. Accion recommends PSNH review its existing practices and policies concerning its ability to start planned outages early, on a unit-by-unit basis, to ensure that it economically maximizes the ability to take an outage early while minimizing potential increases in outage duration.

The next outage that suggests performance can be improved is related to Merrimack Combustion Turbine Outage CT 1-B on 9/12/09, in Exhibit MDC-7. Lightning strikes and blown fuses have occurred at this location, and have been noted in prior Energy Service/Stranded Cost Recovery Reviews. The repetitiveness of such occurrences suggests potential design deficiencies in the distribution system adjacent to the Merrimack Combustion Turbines[3]. In this regard, Accion recommends that fuse coordination, protection device placement, and lightning protection at this and surrounding locations be checked to ensure optimum equipment protection is in place, allowing the most reliable operation of these units.

The last item suggesting performance improvement involves the outage identified as Merrimack Turbine Outage CT 2-D, in Exhibit MDC-7 on 10/19/09. This outage resulted from a valve position irregularity. While work had been performed on the unit prior to this event and after its last successful operation, the work did not involve repositioning of this valve and did not involve tagging[4] of any equipment. No other work was performed on the unit. Accion recommends that PSNH establish a procedure that expands its review process for safety related incidents to include non-safety related incidents. PSNH should also save its used tags or other pertinent information for internal investigative purposes when any abnormal switching,

[3] Accion notes that the distribution system is that of the Concord Electric Company.

valving, or operation event takes place. This recommendation applies to all PSNH generation facilities.

The next outage is Amoskeag Outage 2-C that occurred on 11/23/09. The majority of this outage occurred in 2010 and as such, prudence will be considered in the year in which the majority of the outage occurs as historically performed. It is mentioned here only as a bookmark for the evaluation of the 2010 Energy Service/Stranded Cost Recovery Charge review.

Q. Commission Staff also requested that you review PSNH's efforts with regard to the twelve stipulation items agreed to in Docket DE 09-091. Please present the results of your review.

A. Certainly. The details of my review are contained in Exhibit MDC-9. Exhibit MDC-9 describes the issue in each stipulated item, PSNH's actions, Accion's view regarding whether the PSNH effort was appropriate and complete, and Accion's recommendation as to the disposition of the item. A summary appears directly below.

1 - Mitigation of Customer Costs regarding certain 2008 generation unit outages

From Section II-A of the Stipulation, PSNH was to provide its efforts to mitigate customer costs related to the HP/IP turbine outage (Outage MK-2 E), and the exciter outage at Newington (Outages NEW 1-C, and Outage NEW 1-D).

[4] Tagging is a command and control procedure used when switching electrical elements or repositioning valves to ensure equipment integrity and personnel safety.

PSNH bundled all the issues in the Merrimack and Newington outages because they believed that they had more leverage with Siemens in doing so. The details of the individual mitigation issues are presented in Item 1 of Exhibit MDC-9. Noteworthy is that PSNH was able to surmount Siemens' efforts to treat the HP/IP turbine as used equipment because of the equipment failure, and further claim that the performance guarantees given for the "new" HP/IP turbine were no longer valid. PSNH secured new performance guarantees from Siemens for the damaged turbine as part of its settlement. Accion believes PSNH made the correct judgment in its global approach for two reasons. PSNH protected its customers against future damage claims that may result from future HP/IP problems and assured the preservation of the economics of the project as originally envisioned for customers. PSNH received significant concessions from Siemens, although some of them are subjective in nature because of their future application. The economic transactions of the settlement are not complete.

Accion accepts PSNH's approach as reasonable and recommends that the Commission:

- Leave Outage MK-2E open – Financial mitigation reporting incomplete.
- Close Outage NEW 1-C – Commitment satisfied.
- Close Outage NEW 1-D – Commitment satisfied.
- Require PSNH to file a report that captures the final monetary resolution with the Commission prior to the next Energy Service/Stranded Cost Recovery Review.

2 – Schiller Warranty Items

From Section II-A of the Stipulation, PSNH agreed to submit a report by February 1, 2010, regarding the issues of Alstom's warranty (and performance) issues relating to the outages at Schuiller-5, and to continue to file such reports until all issues are resolved.

PSNH filed its first report with the Commission on February 1, 2010. Specific discussion on each Alstom issue appears in Item 2 of Exhibit MDC-9. Alstom made many repairs at its cost, and others out of warranty. Accion considers these issues resolved as PSNH can take no further action. There are two design issues that remain in negotiations.

Accion believes that PSNH has mitigated the effects of the issues not in negotiations to the extent that it can, with no further PSNH action available.

Accion recommends that the Commission:

- Close the Air Damper Shaft Linkage Workmanship Issue – Issue resolved.
- Close the Inlet Header Economizer Tube Stress Crack Issue – Issue resolved.
- Leave open the Forced Draft and Induced Draft Fan Capabilities Under Soft Start Conditions Issue – Negotiations still in progress.
- Close the Alarm Point Mis-set Issue – Issue resolved.
- Close the Inlet Duct Design Issue – Issue resolved.

- Close the Induced Draft Fan Circuit Board Failure Issue – Issue resolved.
- Close the Vortex Finder Issue – Issue resolved.
- Leave open the Air Heater Design Issue – Negotiations still in progress.
- Require PSNH to file a report with the Commission on the two remaining open items prior to the 2010 Energy Service/Stranded Cost Recovery Charge review.

3 - Review of Isophase Bus Duct at Merrimack and Schiller Stations

From Section II-A of the Stipulation, PSNH agreed to perform an evaluation of the need for isophase bus duct heaters at Merrimack and Schiller stations.

PSNH hired Eaton Electric to perform the evaluation. A full description of the Eaton report appears as Item 3 in Exhibit MDC-9. Eaton was the electrical contractor who made the repairs on the isophase bus duct heaters at W. F. Wyman 4, which was the precipitating event that led to the recommendation for this evaluation. Eaton concluded that PSNH units at Merrimack, Newington, and Schiller stations are constructed in a different manner than W. F. Wyman 4. This significantly reduces exposure, similar failures are not expected, and heaters were not required.

Accion agrees with the Eaton report and recommends that the Commission:

- Close this item – Commitment satisfied.

4 - Review of Low Oil Alarm Procedures

From Section II-A of the Stipulation, PSNH agreed to review its procedures when a low oil alarm for hydro unit bearings is received at the E-SCC.

A full description of the PSNH review appears as Item 4 in Exhibit MDC-9. PSNH performed the investigation in-house, and concluded its procedure is adequate as written. PSNH based its conclusion on the fact that the existing procedure requires that an operator is dispatched to a station when a low oil alarm is received. Existing trip settings protect the bearing from damage if there is loss of oil and upgraded bearing protection systems are being installed on all hydro units by the end of 2010.

Accion agrees with the PSNH conclusion and timetable for the upgraded protection systems. Accion notes that the existing low oil alarm procedure was not clearly understood by Accion at the time of the Stipulation, in that an operator would be dispatched to the station prior to re-starting the unit.

Accion recommends that the Commission:

- Close this item – Commitment satisfied.

5 - Interconnection of PSNH Generating Units to the PSNH Distribution System

From Section IIA of the Stipulation, PSNH agreed to perform an interconnection analysis of all its units connected to its lower voltage distribution system in an effort to prevent improper tripping of units for unrelated system disturbances. PSNH additionally committed to file a report documenting progress on this matter to date, along with an estimated completion schedule with the Commission for review in the 2009 Energy Service/Stranded Cost Recovery Review.

PSNH filed a progress report with the Commission on May 7, 2010. A full description of the PSNH review to date appears as Item 5 in Exhibit MDC-9. In summary, PSNH completed its under voltage relay study and found that most under voltage relays were set higher than they believed they should be. Under voltage relays should all be reset by the end of 2010. PSNH did not include the Schiller CT in its analysis because of its normal system configuration to the 115kV system, but has agreed to do so because the unit can be connected to the PSNH lower voltage system. PSNH is just starting its review of over speed relays. PSNH is performing 2 or 3 coordination studies per year of its stations, many of which are required with the installation of new equipment.

Accion believes good progress is being made in both understanding and addressing the issues caused by the poor distribution coordination.

Accion recommends that the Commission:

- Leave this item open – Analysis and implementation incomplete.
- Require PSNH to file an additional report with the Commission prior to the 2010 Energy Service/Stranded Cost Recovery Charge review,

including progress on its analysis of the Schiller CT and unit over speed relays.

6 - Establish a Relay Test Program

In Section II-A of the Stipulation, PSNH agreed to establish a formal relay test program for all its units connected to the lower voltage distribution system. Previously, no formal program existed. PSNH additionally committed to file a report on its progress on this matter, to date, along with an estimated completion schedule with the Commission for review in the 2009 Energy Service/Stranded Cost Recovery Review.

PSNH filed a progress report with the Commission on May 7, 2010. PSNH created the PSNH Hydro Protective Relay Procedure and has integrated it into its Northeast Power Coordinating Council (NPCC) testing procedures, as required. The larger generating stations fall under direct NPCC relay testing requirements.

Accion believes that PSNH's efforts address the issue and recommends that the Commission:

- Close this item – Commitment satisfied.

7 - Evaluate Procurement of Critical Spare Generator and Turbine Components, Physically or Contractually

In Section II-A of the Stipulation, PSNH agreed to perform an evaluation of procuring spare critical generator and turbine components, or entering into arrangements with vendors, manufacturers, and others to reduce the risk of catastrophic component failures.

PSNH made the determination that spare parts for critical components should be procured on a case-by-case basis. The main basis for their determination was that PSNH does business in a deregulated market environment and that a business case should be made for each application. In addition, PSNH stated the industry was responding to the market conditions with "seed" programs for unit components and efficiency upgrades for components which render spare components less useful or totally useless. Additionally, utilities have lost cooperation among themselves in the market environment, requiring a single utility to bear all costs of spare components.

Accion agrees with the PSNH assessment and recommends that the Commission:

- Close this item – Commitment satisfied.

8 - Hold Manufacturers Responsible for Unreasonable Delays of Shipments of Major Components and Have Shipment Plans in Place

In Section II-A of the Stipulation, PSNH agreed to ensure that contractual arrangements with the manufacturer will hold the manufacturer responsible for unreasonable (shipping) delay of major components, and that the manufacturer has plans in place for shipping major components.

A detailed description of PSNH's efforts appears as Item 8 in Exhibit MDC-9. PSNH holds the manufacturer and the trucking company responsible to "carry safely" and "arrive timely". PSNH discussed shipping issues with Siemens and developed a "living" transportation schedule that would be adjusted for changes in ship dates throughout the outage. Updates of the transportation schedules are done in conjunction with the trucking company with the goal to minimize transportation delays considering potential contingencies. No contractual agreements were included in this review, except the usual guaranteed ship date with the manufacturers. PSNH stated that the new transportation understanding was implemented during the Merrimack 2 HP/IP turbine outage repair.

Accion believes that the process worked well and that both PSNH and Siemens were well in tune with what the other party was doing. However, further review is also required due to the critical nature and financial consequences to customers from transportation mishaps.

Accion recommends that the Commission:

- Require PSNH to evaluate if additional tools such as GPS, speed and shock recorders, or other devices or methods should be employed to further augment its "carry safely" and "arrive timely" goals.

- Close this item upon agreement by PSNH to Accion's recommendation.

9 - Perform Own Review of Maintenance Outage Cycle Extensions

In Section II-A of the Stipulation, PSNH agreed to perform its own analysis of outage maintenance cycle extension, rather than rely solely on the manufacturer's recommendation associated with major components.

A detailed description of how PSNH will determine the maintenance cycles of its units is contained in Item 9 of Exhibit MDC-9. PSNH commits to factor into its maintenance cycle determination many of the issues that manufacturer's general recommendations only address on a fleet basis.

Accion accepts PSNH's approach to maintenance cycle planning. Accion recommends that the Commission:

- Close this item – Commitment satisfied.

10 - Protocol for Transmission and Distribution Personnel Working in Substations Containing PSNH Generating Units

In Section III-D of the Stipulation, PSNH agreed to establish a protocol for transmission and distribution workers performing activities in substations containing PSNH generating units.

PSNH established and implemented a protocol for NU and contact transmission and distribution workers performing activities in substations containing PSNH generating units. The protocol is described in Item 10 of Exhibit MDC-9. The PSNH protocol requires that non-employees cannot have unescorted access in PSNH generating facilities. Employees are granted access within a substation according to their skill level; no employee can escort a worker above their skill level.

Accion accepts PSNH protocol for work activity inside substations containing PSNH generation. Accion recommends that the Commission:

- Close this item – Commitment satisfied.

11 – Other Agreements

In Section II-A of the Stipulation, PSNH accepted the recommendation that National Electrical Safety Code patrols be performed on all distribution facilities on a four-year schedule.

In Section II-A of the Stipulation, PSNH accepted the recommendation that PSNH address danger trees outside of the 34.5kV right-of-way and determine where PSNH does and does not have rights to remove such danger trees.

Accion has no analysis or recommendations with regard to these items. Efforts to address NESC inspection frequency and danger trees outside of the right-of-way were considered as part of Docket DE 09-035.

Q. Are there any other items you wish to discuss?

A. Yes, there is one. As part of its review of 2009 generation plant outages, Accion reviewed the PSNH GenIS (Generation Information System)[5] report for 2009. This data base is a take-off of the more common data base used in the industry on a national basis called Generating Availability Data System (GADS). While the data base generally mimics the GADS data base, Accion believes that additional refinement with regard to outage causes could be beneficial to PSNH in the operation of its units. Other refinements may also be beneficial.

Q. How would additional refinement be beneficial?

A. Accion believes that additional refinement of the GenIS data would be beneficial to PSNH for two reasons. The most important is the age of the units. As units age, specific components may become problematic. Systematic review of outage causes may enable PSNH to specifically identify problem components. For example, let us assume that a unit is having boiler trips due to tube leaks. While PSNH may establish that the leaks are in the economizer section of the boiler, a more refined codification of the GenIS data may lead one to specific tubes or tube sections that were replaced in 1986 versus other tubes in the boiler. The second reason is that PSNH operates in a market environment. It needs specific data to perform business cases with regard to repairs relating to operation of its units. Such capability will allow PSNH to make better and more informed business decisions.

[5] The PSNH GenIS system is an in-house generation information system designed to track generation information such as outage time, cause, etc. which NU adopted in 2000.

Q. How should PSNH refine its GenIS data?

A. Accion makes no specific recommendation in this regard. What Accion does recommend is that PSNH should determine what additional information it may need in its GenIS system to perform market based equipment evaluations in the wide variety of plants it operates; take an objective look at its GenIS system capabilities; perform a review of its entire GenIS system; and make appropriate changes which might include a different information system, such as the GADS system. Accion believes that such a review will result in better operation of the units and greater efficiencies to customers.

Q. What was the result of your review of the unit availability factors, capacity factors and heat rates of the PSNH units?

A. As stated above, the base load units have run near or better than expected, considering that many factors have tended to reduce unit output and lower performance metrics, and excluding the impacts that reserve shut-down status has had on the operation of the units. Over the last number of years, PSNH has been extending the period in which major maintenance outages are performed on some of its units. Major overhauls are now conducted on different cycles, depending on the unit and its maintenance requirements.

Accion made the following observations regarding 2009 availability factors, capacity factors (with planned outages removed from the calculations so that the different maintenance schedules do not skew the data) and heat rates for the major PSNH units.

Schiller 4 and Schiller 6 availabilities have historically been about 95 percent with capacity factors of over 80 percent. In 2009, reserve shutdowns required by the ISO-NE due to depressed energy prices reduced the capacity factors of these units to approximately 60 percent. Without reserve shut downs, the unit's capacity factors would have been much closer to historic values.

Unit 5 at Schiller had its boiler replaced in late 2006 with a wood fired fluidized bed boiler. This unit has different operating characteristics than the old coal fired boiler, so Accion makes no comparisons with historic operation. Accion does note that in 2007, the first full year of commercial operation of the unit had numerous startup and warranty issues which impacted the availability and capacity factors for the unit. In spite of new unit difficulties, Schiller 5 had an approximate 85 percent availability and an approximate 80 percent capacity factor for 2007. In 2008, further improvement was noted, in that unit availability was proximally 90 percent and unit capacity factor was about 80 percent. In 2009, unit availability exceeded 90 percent and its capacity factor increased to 85 percent. Accion believes that the improvement in unit operation is due to the resolution of start-up problems and the increased proficiency of PSNH personnel as they learn how to operate this high technology wood-fired boiler.

Newington maintained an availability of over 95 percent in 2009. Its capacity factor has fallen from 60 percent in 2003 to 40 percent in 2005, to 10 percent in 2006 and

2007, and to 3 percent in 2008. In 2009, its capacity factor increased to about 7 percent, with times of operation at other than what would be expected from an economic viewpoint, and at a reduced load as shown in its heat rate data. Accion attributes the cost of the unit in relation to the market price for the recent reduced capacity factor. What Accion cannot definitively explain is the increased requirement by ISO-NE for Newington to operate in a market where one would not expect it to do so. Accion believes that there are changes developing in the ISO-NE market that places value on the fast response capability of the unit.

Historically, capacity and availability factors for Merrimack-1 have been approximately 90 to 95 percent since it went to its two-year maintenance schedule in 2002. In 2009, the availability factor for this unit was about 95 percent. In 2009, there was no overhaul on this unit, but its capacity factor dropped to about 85 percent due to reduced operation during shoulder load periods.

The availability factor for Merrinack-2 has historically been approximately 90 to 95 percent. The historical capacity factor is about 85 to 90 percent. In 2009, the unit availability factor was approximately 95 percent and the capacity factor was approximately 85 percent, excluding the impact of the extended overhaul to correct problems with the HP/IP turbine.

Q. Are there other observations you made with regard to the availabilities and capacity factors of PSNH generating units?

A. There is one; the capacity factor of Newington was approximately 7 percent in 2009. Information supplied by PSNH states that Newington cost millions more than it earned for customers in 2009, which cost is approximately the same as similar information supplied in the 2008 review. Such costs bring into question the continued operation of the unit from an economic viewpoint, which should be addressed. It is my understanding that PSNH was required to conduct a Continued Unit Operation study as part of its recently-filed Least Cost Integrated Resource Plan, therefore, I suggest that this issue be further explored in that proceeding.

Q. What are your observations regarding the heat rates of the PSNH major generating units?

A. The full load heat rates of the PSNH units have remained relatively constant over the last six years, indicating capital and maintenance expenditures are adequate. With unit reductions required by ISO-NE dispatch requirements, PSNH has maintained as high a heat rate as can be maintained for its fossil units in the market environment it operates in.

Q. What did you form as a conclusion when you reviewed the projected spending for capital projects and O&M at PSNH generating stations?

A. Accion reviewed the five-year capital and O&M budgets (business plans) for Merrimack Station, Newington Station, and Schiller Station. Accion also reviewed the five-year business plan for the Hydro group as well as its ten-year conceptual budget plan. Accion made the following general observations, and drew the following conclusions.

Capital

PSNH capital expenditures remain relatively constant at present levels into the future when adjusted for major unit overhauls and other large planned capital expenditures[6]. PSNH has included FERC licensing requirements, dam repairs, and general capital project replacements in its budget projections at all stations.

Accion observes that the PSNH five-year business plan calls for continued minor and major equipment replacement as required for reliable and efficient unit operations.

O&M

PSNH O&M expenditures remain relatively constant at present levels into the future, when adjusted for major unit overhauls and other large planned capital expenditures[7]. PSNH has included FERC licensing requirements, dam repairs, and general capital project replacements in their budget projections at all stations.

[6] With regard to Newington Station, the budgets reviewed by Accion do not reflect the ongoing re-evaluation of Newington budgets relative to its recent reduced operation in the market environment.

[7] With regard to Newington Station, the budgets reviewed by Accion do not reflect the ongoing re-evaluation of Newington budgets relative to its recent reduced operation in the market environment.

Accion observes that the PSNH five-year business plan calls for continued maintenance of equipment as required for reliable and efficient unit operations.

Accion concluded that PSNH is currently spending and plans to spend sufficient funds for capital replacement/improvement projects and sufficient money for adequate maintenance to assure continued operation of its units consistent with good utility practice and with recognition of unit age and operational duty cycle. Such expenditures should result in reliable and efficient unit operation.

Q. Are there any other items you wish to discuss?

A. I only wish to list the data responses relied upon by Accion in preparation of its testimony in addition to the materials filed by PSNH so they may be officially admitted into the record. Those data responses are:

Staff Set 01

Data Responses 2 through 3, 7 through 21, and 22 through 59.

Staff Set 02

Data Responses 2 through 5, and 7 through 18.

OCA Set 01

Data Responses 4 through 5, 8, and 10 through 14.

OCA Set 02

Data Responses 1, 6 through 8, and 10 through 13.

TECH Set 01

Data Responses 1 through 4 and 6 through 8.

CLF Set 01

Data Responses 1 through 11 and 13.

CLF Set 02

Data Responses 1 through 6.

SCNH Set 01

Data Responses 5 and 12.

SCNH Set 02

Data Responses 1 through 5.

TC Set 01

Data Responses 1 through 2, 5, 7 through 9, 13 through 14, and 16 through 19.

TC Set 02

Data Responses 1 through 3.

Q. Does that conclude your testimony?

A. Yes, it does.

RESUME OF MICHAEL D. CANNATA, JR., P. E.

Michael D. Cannata, Jr., P. E.

Areas of Specialization

Investigations of safety, reliability, and implementation of public policy in the electric and gas industries; investigations of unit outage and system outage causes, electric utility operations and planning; bulk power system planning; interconnections; transmission system design.

Relevant Experience

Accion Group, Inc.

- Provides Transmission and Engineering services to the New Hampshire Public Utilities Commission.
- 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.

Innovative Alternatives, Incorporated

- Technical advisor to the Maine Public Utilities Commission regarding the public convenience and necessity of 37 projects totaling more than 350 miles of 115 kV and 345 kV facilities.
- Technical advisor for Structal Bridge Corporation regarding electrical interconnection requirements for its plant expansion making it the largest bridge manufacturer in North America

The Liberty Consulting Group

- Lead consultant for Liberty'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 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. Also included was a review of the electric and gas system designs.
- Lead investigator reviewing the adequacy of system interconnection requirements of a major renewable fuel resource for the Nova Scotia Utility and Review Board.
- 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.
- A lead investigator monitoring Commonwealth Edison's implementation of T&D system reliability improvement recommendations resulting from major system outages for the Illinois Commerce Commission.
- A lead investigator in the prolonged outage of Ameren T&D facilities following severe wind and ice events in 2006 for the Illinois Commerce Commission.
- A lead investigator monitoring Ameren's implementation of T&D system reliability improvement recommendations resulting from major system outages for the Illinois Commerce Commission.
- A 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.
- A 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.
- Served as a lead investigator in the review of distribution and transmission practices at Alabama Power and Georgia Power Company.
- 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.
- Served as lead investigator in prudence reviews of major fossil and nuclear plant outages and power purchases for the New Hampshire Public Utilities Commission.
- Served as the principal technical and analytical member in the Seabrook nuclear unit sale team acting for the New Hampshire Public Utilities Commission.
- Investigated the causes of overlapping unit outages at a major Reliant generation facility.

New Hampshire Public Utilities Commission - Chief Engineer

- 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.

- 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 state-wide competition in the electric industry to proceed.
- Investigated the operation and outages of the fossil and nuclear facilities of the Public Service Company of New Hampshire.
- Advisor to the Commission on utility system and operational issues including those of alternative energy generation.
- 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.
- Re-drafted the state's Bulk Power Siting Statute and facilitated resolution of widespread legislative tensions.
- Instrumental in achieving quality of service levels among the highest in Verizon's service territory.

Public Service Company of New Hampshire (PSNH)

- As Director - Power Pool Operations and Planning, PSNH
    - Responsible for the operation and dispatch of PSNH transmission and generation facilities through the New Hampshire Electric System Control Center.
    - 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.
    - Core Task Force Member for the DC electrical interconnection between Hydro Quebec and the New England Power Pool.
    - Developed real time integrated transmission system loading capabilities for the New Hampshire Electric System Control Center.
    - Represented PSNH at all major relevant national and regional reliability organizations including:
        - New England Power Pool
            - System planning Committee
            - System Operations Committee
            - All 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

- As Director - System Planning/Energy Management, PSNH

    - Coordinated the company's capital planning requirements for generation and transmission. Integrated its load forecasting and energy management activities.
    - A 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.

- As Manager - 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.

Education

M.B.A., Northeastern University - 1975
M.S.E.E., Power System Major, Northeastern University - 1970
B.S.E.E., Power System Major, Northeastern University - 1969

Registration

Registered Professional Engineer - New Hampshire #5618

2009 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 2009 ranged from 893 MW in October, to 1,305 MW during August. On-peak monthly energy ranged from 241 GWH in November to 353 GWH in January, and off-peak monthly energy ranged from 222 GWH in September to 349 GWH in January. During 2009 PSNH met part of its system need by purchases from other suppliers. In 2009 these external supplies provided 21% of monthly on-peak requirements in March and 66% during September. Off-peak supplies from the market in 2009 equaled 8% of system need in March and 56% in August. For the year, the market supplied a total of 37% of PSNH's on-peak energy requirements and 27% of its off-peak requirements.

Source of 2009 System Need

Period	System Peak	System Need		Market Supply (percentage)	
		On-Peak	Off-Peak	On-Peak	Off-Peak
January		353 GWH	349 GWH		
March				21%	8%
August	1,305 MW				56%
September			222 GWH	66%	
October	893 MW				
November		241 GWH			
Total for 2009				37%	27%

PSNH Sources of Energy and Capacity

In 2009 and at summer ratings[1], PSNH owned approximately 528 MW of coal-fired units at two stations, 419 MW of oil-fired plants in two units, 65 MW of hydro-electric plants from nine stations, 43 MW of wood-fired generation in a single unit, and 83 MW of combustion turbine generation in five units at four locations. PSNH also purchased 20 MW of nuclear capability from a single unit, 55 MW from various PURPA-mandated purchases, and 10 MW (no capacity) from Independent Power Provider (IPP) buyout replacement contracts.[2] The PSNH portfolio totals approximately 1,213 MW of summer capability, and 1,278 MW of winter capability. [3, 4]

In addition, PSNH received variable monthly capacity credits from the Hydro Quebec interconnection. PSNH must meet its share of the Independent System Operator – New England (ISO-NE) monthly capacity requirement, which ranged from 1,752 MW in September, to 2,212 MW in March. The difference between PSNH resources and the ISO-NE monthly requirement, including reserve requirements, must be made met through supplemental capacity purchases. The market represented approximately 23% and 41% of PSNH monthly capacity requirements in September and January respectively and varied from 404 MW during September to 882 MW in January 2009.

Load obligation requirements remained difficult to forecast in 2009. At the beginning of January, approximately 125 MW (8 %) of PSNH's large customers were turning to market or self supply. By the end of December, the load obligation loss was 468 MW (28 %). The energy related to customer migration was 74 GWH in January and 193 GWH in December. For the 2009 calendar year, energy migration totaled 1,503 GWH, compared to the 596 GWH PSNH forecasted at the December 2008 Energy Service update[5]. Accion notes that in mid-2008, PSNH was using 6% migration, the current level at the time, and that many of the 2009 purchases were made in or prior to that time period.

[1] 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.
[2] These figures do not include Lempster Wind or unit contingent contracts.
[3] These figures do not include any capability from the Bethlehem, Tamworth, or Lempster Wind power purchase agreements.
[4] The units that are owned by PSNH, along with capacity under firm contract are, collectively, referred to as "PSNH Generation" in this Exhibit.
[5] PSNH does not do a migration forecast per se, but uses the then actual value at a constant level for the future.

Allocation of Wholesale Marketing Department FTEs

	2005		2006		2007		2008		2009[2]	
Bidding & Scheduling	2.00	1.75	2.00	1.75	2.00	1.75	2.00	1.75	2.00	1.99
Resource Planning/Analysis	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	1.45
Energy & Capacity Purchasing	1.00	0.50	1.00	0.50	1.00	0.50	2.00	0.50	2.00	0.74
Standard Offer & Default Service Procurement	2.00	0.00	2.00	0.00	2.00	0.00	3.00	0.00	2.00	0.00
Contract Administration	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00
Administrative Support	1.00	0.25	1.00	0.25	1.00	0.25	1.00	0.25	1.00	0.33
Management	1.00	0.25	1.00	0.25	1.00	0.25	1.00	0.25	1.00	0.11
Total	14.00	4.75[1]	14.00	4.75	14.00	4.75	16.00	4.75	16.00	4.62

1 - In 2004, PSNH was allocated 5.75 FTEs.

2 – In 2009, FTE allocation by function was by time sheet allocation.

PSNH Management of Procurements

PSNH's energy procurement is managed in coordinated by Northeast Utilities (NU). During 2009 NU dedicated the equivalent of employed 16 full time employees (FTEs) [6] in the Wholesale Marketing Department, which was up from 14 in 2007. In 2008 the department employed 16 FTEs. In 2008, 4.75 FTEs were allocated to PSNH, which was unchanged from 2008. The remaining 11.25 FTEs were allocated to two other NU subsidiaries without load-serving responsibilities.

The 2009 FTE allocation to PSNH totaled 4.62 FTEs, down slightly from the 4.75 FTEs allocated to PSNH in 2008. From June 2003 until 2009 PSNH had on-site full time capacity/energy planning personnel in New Hampshire dedicated to New Hampshire power

[6] In actuality because of an open position, that figure was 15.25 FTEs.

supply. In 2010, that person was replaced with a new individual based in Connecticut. The new person has many years of energy market experience. From an organizational viewpoint, the New Hampshire position reports to a Connecticut manager. PSNH personnel informed Accion that they do not see the home base of the individual as an issue at this time as the individual is spending considerable time in the field at PSNH and, according to PSNH; the field time spent was comparable to historic levels.

PSNH 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. During on-peak periods, purchases vary from 0 MW during low load months to 400 MW in high load months. During off-peak periods, purchases vary from 0 MW to 400 MW in the overnight hours and from 0 MW to 600 MW during weekend days. The reason for such high purchases in off-peak periods is that Newington Station (Newington) is not generally economic to dispatch. 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 are increased if any of PSNH’s generation portfolio is unavailable when needed to serve load, or if loads are higher than planned due to variation 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 considers this portion of the energy supply to be “variable.”

In general, PSNH supplemented the PSNH Generation with monthly, weekly, 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. The table below shows how PSNH on-peak and off-peak energy requirements have been supplied by its own resources and the bilateral and ISO-NE spot markets. Of note is the increasing reliance on market energy generally due to load growth through time and the relatively constant value of PSNH generation through time. Actual weather and major unit outages that do not occur every year can also alter these percentages.

Percent Supply of PSNH Energy Requirements from PSNH and Market Sources[7]

	PSNH Owned Generation (Percent)		Bilateral and Spot Energy (Percent)	
	On-Peak	**Off-Peak**	**On-Peak**	**Off-Peak**
2004	83	90	17	10
2005	74	85	26	15
2006	67	80	33	20
2007	66	80	34	20
2008	56	71	44	29
2009	63	73	37	27

The following table shows how PSNH units and the markets supplied PSNH energy requirements for 2009.

Percent of PSNH 2009 On-Peak and Off-Peak Energy Requirements Supplied by PSNH and the Markets[7]

Source	On-Peak (Percent)	Off-Peak (Percent)
Merrimack & Schiller	43	51
Hydro	5	7
Vermont Yankee	2	3
IPP's	7	9
Buyout Contracts	1	1
Newington & Wyman	4	1
Combustion Turbines	0	0
Bilateral Purchases	34	22
ISO-NE Spot Purchases	3	5
Total	99	99

[7] Percent figures may not total 100 due to rounding.

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

Historical PSNH Supplemental Purchases and Source[7]

	Sup. Purchases (GWH)	LT Bilateral (%)	ST Bilateral (%)	ISO-NE Spot (%)
On-Peak				
2004	900	52	22	26
2005	1,424	83	4	13
2006	1,815	85	10	5
2007	1,642	78	9	13
2008	2,046	81	7	12
2009	1,703	90	3	7
Off-Peak				
2004	431	0	33	67
2005	847	79	3	18
2006	1,106	79	6	15
2007	945	73	5	22
2008	1,210	64	5	31
2009	1,139	85	2	13

1 – The percent figures may not total 100 due to rounding.

Historic PSNH Supply Approach

Historically, PSNH has altered its approach to supply procurement each year to deal with changing conditions. In the summer of 2005, PSNH continued to cover its position and purchased blocks of bilateral power for 2006 to bring stability to pricing and to limit potential under-recoveries in every month, rather than just the peak months and months of unit outages as was done for 2004. In June 2006 PSNH also supplemented its bilateral purchased for July and August. In addition, PSNH did more hedging in 2006 for both on-peak and off-peak load periods to better reflect the forced outage rates of the coal units. In 2007, PSNH intended to establish a fixed annual energy service rate that is subject to minimal under or over recovery. PSNH established its monthly purchase targets in the first quarter of the prior year and made a series of purchases of bi-lateral energy through November to cover these targets. In addition, PSNH purchased short-term bilateral energy to cover forced outages and the high load periods. All other energy was either procured from its own units or from the spot market. In 2008, PSNH followed the same purchase pattern that it used in 2007.

In 2005, PSNH purchased 500 MW of its 2006 capacity requirement via an annual contract. The capacity market was scheduled to switch to the new Forward Capacity Market (FCM) in October 2006, however, the switch over did not take place until December 2006. Uncertainty regarding the start date of the new FCM rules virtually precluded further capacity contracts after June 1,

2006. When the 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 are reduced by their individual forced outage rates. The seasonal capability of PSNH units is also discounted for their forced outage rate to meet its percentage of the ISO-NE supply obligation. The FCM took effect in December 2006 and was in full effect for 2007 and beyond.

PSNH uses Financial Transmission Rights (FTRs) in all hours where it expects its units to run to protect against congestion pricing in the pool. In essence, FTRs trades a known price for a potentially high variable congestion price. These rights 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 between the major PSNH Generation (that is, Vermont Yankee, Merrimack, Newington, Schiller, and the Mass. Hub) for the months they are expected to run or in which purchases are made from the market (collectively these are known as the source locations) and the New Hampshire load zone (referred to as the sink location). In 2009, PSNH purchased 6,480 MW-months of on-peak FTRs and 3,197 MW-months of off-peak FTRs. The table below shows PSNH's historical FTR purchases, their value regarding avoided congestion costs, and their cost to PSNH customers.

PSNH Historical FTR Costs and Savings

Year	Auction Cost (Thousands)	Avoided Congestion Costs (Thousands)	Net Cost (Thousands)
2003	414	488	(74)
2004	1,341	1,417	(76)
2005	777	896	(119)
2006	301	133	168
2007	973	1,133	(160)
2008	827	237	590
2009	10	122	(112)

Historical Performance

The historical performance of PSNH units is considered when determining when to procure supply from supplemental sources

PSNH Major Unit Historical Unit Heat Rates [8]

Unit	Average Annual Heat Rate (BTU/kWh)					Full Load Heat Rate (BTU/kWh)
	2005	**2006**	**2007**	**2008**	**2009**	**2009**
Merrimack-1	10,184	10,376	10,264	9,933	10,211	9,900
Merrimack-2	10,071	10,328	10,157	9,723	9,919	9,520
Newington	11,522	12,270	11,723	11,690	12,382	10,900
Schiller-4	12,558	12,832	13,405	12,244	13,019	12,900
Schiller-5	12,871	9,398(1)	15,565	16,689	17,122	15,800
Schiller-6	12,379	12,460	12,528	12,072	12,644	12,300

Historic Unit Capacity Factors

The table below shows the historical capacity factors and the projected capacity factors used for the 2008/2009 period.[9]

Actual and Projected Annual Capacity Factors for PSNH Major Units

(Annual Generation/Winter Rating/8760)

Unit	Actual Capacity Factor (Percent)									Forecasted
	2001	**2002 (1)**	**2003 (2)**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2009**
Merrimack-1	81.6	74.7	93.3 (3)	86.8	90.6 (3)	80.6	95.7(3)	79.8	84.1 (3)	88.3
Merrimack-2	72.7	75.7	73.9	80.3	79.1	84.1	82.9	72.8	56.1	55.7
Schiller-4	66.5	65.4	73.9	73.7	76.5	71.1	84.2	78.5	59.5(6)	76.4
Schiller-5	59.3	68.2	73.5	74.0 (4)	72.4 (4)	42.0(5)	76.7	79.8	79.6	75.7
Schiller-6	62.8	71.6	75.1	76.6	81.4	77.6	74.6	80.7	56.9(6)	70.4
Newington	12.6	19.0	55.9	50.3	33.5	8.0	9.3	3.3	5,2	6.9

(1) - Seabrook removed from PSNH mix for November and December due to sale.
(2) - First full year Seabrook is not in PSNH mix.
(3) - No unit overhaul in this year.
(4) - Very minor outage this year due to wood conversion.
(5) - Coal to wood boiler conversion project.
(6) – Actuals reflect reserve shut down periods.

2009 Energy Market

Where much of PSNH generation is either base load or peaking generation, it is not expected that they will have significant interaction with the market. The remaining unit, Newington, is the unit

[8] Coal to wood conversion took place in 2006.
[9] Calendar 2009 is in this period.

most likely to interact with the market because of its cost. The following paragraphs estimate the range of Newington's cost and the market prices produced for the price range of oil and gas by quarter.

In the first quarter of 2009, price volatility dominated the marketplace. Gas varied in price from $6 to $15 per MMBTU, or 6 cents to 15 cents per kWh, assuming a 10,000 BTU/kWh heat rate (approximately the full load heat rate of Newington), and #6 oil remained stable at approximately $6.00 per MMBTU or 6 cents per kWh again assuming a 10,000 BTU/kWh heat rate. These fuel prices produced an on-peak bilateral energy market in New England that varied from 4 cents to 6 cents per kWh during the same time period.

Stability returned to the market in the second quarter of 2009. During that period, gas remained at approximately $4 per MMBTU, or 4 cents per kWh, again assuming a 10,000 BTU/kWh heat rate, and #6 oil rose from $6 to $10 per MMBTU, or 6 cents to 10 cents per kWh, again assuming a 10,000 BTU/kWh heat rate. These fuel prices produced an on-peak bilateral energy market in New England of approximately 4 cents per kWh during the same time period.

In the third quarter of 2009, there was little market volatility and prices continued to fall. Gas ranged from $2 to $4 per MMBTU, or 2 cents to 4 cents per kWh, again assuming a 10,000 BTU/kWh heat rate, and #6 oil stabilized in the $10 to $11 per MMBTU range or 10 cents to 11 cents per kWh again assuming a 10,000 BTU/kWh heat rate. These fuel prices produced an on-peak bilateral energy market in New England that generally ranged from 3 cents to 5 cents per kWh during the same time period.

In the fourth quarter of 2009 gas price rose from $3 to $10 per MMBTU, or 3 cents to 10 cents per kWh, again assuming a 10,000 BTU/kWh heat rate, and #6 oil stabilized at approximately $12 per MMBTU, or 12 cents per kWh, again assuming a 10,000 BTU/kWh heat rate. These fuel prices produced an on-peak bilateral energy market in New England that generally varied from 4 cents to 8 cents per kWh.

The above data is summarized in the following table.

Newington Energy Price Versus New England On-Peak Bilateral Market (Cents/kWh)[1]

	2009 – Q1	2009 – Q2	2009 – Q3	2009 – Q4
Newington on Gas	6 - 15	4	2 - 4	3 - 10
Newington on Oil	6	6 - 10	10 - 11	12
NE On-Peak Bilateral Market	4-6	4	3 - 5	4 - 8

1 – Fuel per MMBTU converted at Newington full load heat rate of approximately 10,000 BTU/kWh.

In 2009, PSNH continued to rely on the market for a significant portion of its energy requirements which included an 18-week outage to repair the Merrimack-2 HP/IP turbine. Loads generally were lower than forecast and up to 25 percent of monthly energy requirements of large customers met their needs from the market or self supply, resulting in a reduced supplemental purchase requirement. Although market prices were high during the beginning and end of the year, market prices were low between these periods. With low market energy prices, PSNH continued to be very susceptible to both market price volatility and to fluctuations in the supplemental purchase volume created by changing economic conditions and the degree to which customers migrate to and from competitive supply options.

PSNH 2009 Supply Approach

In 2009, PSNH altered its procurement strategy in three areas. The first was that PSNH began its supplemental purchases for 2009 in the fourth quarter of 2007, rather than the first quarter of 2008, with the purchase of unit contingent PPA contracts. Late in the first quarter and in the second quarter of 2008, PSNH's review of the forward energy market showed that the peak period prices for calendar year energy were rising and began to procure its 2009 supplemental energy requirements. These purchases continued until early in the third quarter of 2008. At that time, the run up in peak period calendar energy prices reversed. At that point PSNH altered its procurement strategy by markedly reducing its purchases for 2009. After July 2008, PSNH made just a few monthly purchases and after August 2008, and only one additional monthly purchase was made in 2008[10] for 2009. The third change in market procurement was related to the Merrimack turbine repair. Once the outage requirements and anticipated repair time were known, PSNH revisited its supply requirements. In January 2009, with the December 2008 updated load forecast, PSNH purchased additional energy to cover the August – early December Merrimack-2 turbine outage. PSNH stated that it did not purchase full outage requirements at that time because of reduced loads forecasted in the December 2008 update. PSNH further notes that even though additional purchases might have been justified with the mid-year update forecast, that such purchases were not made due to the severity of the recession and migration levels. PSNH made daily purchases as warranted. PSNH personnel also stated that once future supplemental energy is purchased, the company rarely sells that energy into the longer term market. Rather, sales of supplemental energy are generally made only into the spot market.

Under the FCM rules, PSNH was billed at the transition capacity rate of $3.75 per kW-month through May 2009, and $4.10 per KW-month from June through December 2009, for its 4.68 to 5.90 monthly percent share of the 35,363 MW to 39,076 MW of qualified unforced monthly capacity in ISO-NE or 1,752 MW to 2,212 MW per month, less the value of its own resources. The ISO-NE transition rates produced a bill for $92.8 million for capacity and PSNH unit capacity produced a $64.1 million credit, leaving PSNH with a $28.7 million capacity cost for 2009.

[10] The global financial crisis erupted in September of 2008.

PSNH conducts biweekly phone calls with generating station, fuels, operations, and bidding/scheduling personnel. Plant personnel keep capacity/energy planning informed of impending developments at the plants. PSNH views Newington as the major unit on its system that interacts with the market, as all other owned units are either hydro, coal, wood, or long-term resources that are almost always economic or must take contracts[11] or peaking units that are rarely expected to run. The net monthly on-peak energy requirements of PSNH were 9 to 17 GWH of bilateral purchases and 1 to 32 GWH of spot market purchases. PSNH monthly off-peak energy requirements were 4 to 10 GWH of bilateral purchases and 3 to 36 GWH of spot market purchases. The incremental energy needs from the market are determined by the actual weather that occurred, rather than the forecasted average weather in the energy forecast and actual unit operation.

Purchases were based on monthly analysis. PSNH modeled 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 they have extremely low capacity factors and the market price tends to mimic their cost when they do run. 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 will reduce the unit forced outage rate if it 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 oil corrected for SOX and NOX 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 the energy requirements was assumed to be supplied by the spot market as recognition of the risk that PSNH may be wrong in making additional purchases.

PSNH purchased 1,589 GWH of on-peak bilateral energy and 994 GWH of off-peak bilateral energy in 2009. PSNH also spot purchased 114 GWH of on-peak energy and 145 GWH of off-peak energy. PSNH made two types of sales into the New England market. It sold 1 GWH of on-peak energy and 90 GWH of off peak energy from surplus generation from owned units that lost $2.2 million. PSNH also sold unneeded bilateral and spot energy on the spot market because loads failed to materialize as or when expected. PSNH resold 400 GWH of on-peak bilateral energy and 299 GWH of off-peak bilateral energy. These sales resulted in a loss on on-peak energy sales of $23.1 million and a loss on the sale of off-peak energy of $14.6 million for a total net loss of $37.7 million. Total PSNH on-peak sales activity of 401 GWH resulted in revenue of $17.7 million and total PSNH off-peak sales activity resulted in revenue of $14.1 million. Total PSNH energy purchases cost $248.8 million and total PSNH energy sales amounted to $31.8 million resulting in a net cost of energy purchases of $217.0 million.

[11] Although forecasted to be economic in 2009, all PSNH base-load units except Schiller-5 were placed on reserve shutdown at least once during 2009.

PSNH based the 2009 projected unit capacity factors by explicitly modeling planned annual maintenance and 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 table shows that PSNH base load units performed near or better than forecasted, except where reserve shutdowns became a factor due to the reduced price of energy in the ISO-NE market. PSNH modeled Merrimack and Schiller units as base load. PSNH personnel reported that their projections produced no reserve shutdowns for these units. PSNH personnel also stated that in 2009, load forecasts and supplemental purchase needs were evaluated at the time of the December 2008 and July 2009 updates[12].

Evaluation

Accion 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, submitted follow-up data requests, and reviewed detailed backup information of the summary results supplied by PSNH.

Accion concluded that the PSNH filing is an accurate representation of the process that took place in 2009. Accion believes that PSNH made sound management decisions with regard to capacity and energy purchases in its market environment, consistent with its least cost plan as modified on March 28, 2008. Accion also concluded that the capacity factor projections used by PSNH in its purchase projections were reasonable.

At the same time, Accion believes that improvements can be made to the process. PSNH made few or no sales except into the spot market. Possible improvements are described in the recommendations below.

Load Migration

With regard to migration, Accion concluded that it is difficult to do realistic forward looking market purchases when approximately 30% of the load to be served can come and go at will. This is due to customer response to pricing. Customers see higher costs when other customers migrate away from the system as the departing customers seek lower power costs. Any excess energy resulting from the outward migration is generally worthless when resold because the market price is low enough to have caused the migration. Likewise, customers remaining on the system also see higher costs when migration into the system 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 caused the migration. In addition, PSNH's lower cost generation is diluted over a larger MWH load.

[12] During a technical conference, PSNH indicated that it is now updating its load forecast on a quarterly basis. Accion does not know how formal the process is.

Price Volatility

Market price volatility would be expected to decrease in ISO-NE in the future as loads remain depressed due to the 2008 deterioration of economic conditions. Also, it appears the lower demand for gas keeps downward pressure on the price of gas, except for the two quarters where peaks occur. This depressed demand can be expected to continue until load requirements and resources come more into balance, resulting in upward pressure on the price of gas. Accion also believes that the cost of gas in New England may remain depressed beyond the recovery of the current recession, due to the planned expansion of wind turbines and planned increased transmission capability from outside of ISO-NE into New England. This development in new generation and expanded transmission can be expected to mainly replace gas-fired generation, because gas is on the margin much of the time in New England.

Recommendations

PSNH began its supplemental purchases for 2009 at an earlier time than was done for prior years. Accion believes this was done in response to criticism leveled at PSNH in prior years regarding the timing for making short term purchases. For example, PSNH was faulted for having short term energy commitments when the effects of Hurricanes Katrina and Rita resulted in higher prices than if longer term contracts had been employed. In 2009, the converse was true. PSNH entered into long term contacts in 2008 and the floor fell from beneath the financial markets, resulting in lower energy market prices. Customers again had higher energy prices than if short term contracts were used.

These two examples illustrate the difficulty in forecasting future pricing when events beyond the control of the company have a significant and direct impact on pricing from the market. At the same time, PSNH can be expected to identify opportunities and balance supplemental purchasing based on reasonable expectations for market trends. For example, Accion recommends that while market prices remain depressed due to economic conditions PSNH should focus on maximizing the benefits of short term arrangements and spot market prices during the two non-peak quarters.

Similarly, PSNH’s strategy for supplemental energy purchases as a hedge against market fluctuations during the two peak period quarters and to reduce the possibility of large quantities of excess power is unclear, leaving the company vulnerable to retrospective second guessing after purchases are made. Accion recommends that PSNH provide a clear plan for peak period procurements prior to the executing contracts. For example, PSNH should establish the percentage of its on-peak monthly needs will be procured from supplemental sources with an established point of measurement, such as an approved load forecast. Also, Accion recommends that PSNH have a clearly defined the basis for making short term purchases or sales that fall outside of the established projected needs.

Accion recommends that PSNH explicitly and formally factor reserve shut downs into its projection of operation of its units in determining supplemental energy needs if it does not already do so. If reserve shut downs are projected for its base load units, the between planned outage capacity factor should be adjusted to reflect those reductions similar to the manner done for the short reliability unit outages.

Accion recommends that supplemental needs should be reviewed each quarter as the new load forecast is produced. Because econometric inputs to the load forecast are lagging variables, the load forecast is slow to pick up faltering or improving economic conditions. Accion recommends that in each quarterly review PSNH should factor into its supplemental energy purchase decision making process the lagging impact of the econometric input to the load forecast.

Accion recommends that PSNH establish formal criteria governing the sales of purchased surplus supplemental energy into the spot market. PSNH appears to be inconsistent in the treatment of supplemental energy supplies when deciding to sell perceived surplus, when compared how the company employs purchases. Accion recommends that the Commission employ the same prudence review of sales of purchased supplemental energy by PSNH, as is done for supplemental energy purchases. The prudence review should include analysis of PSNH decisions to retain purchased supplemental energy, in addition to review of sales actually made.

Merrimack Outages For 2009 (Without MK-2 Turbine Repair Outage)

Merrimack-1

The following outages occurred at Merrimack-1 during 2009. This unit is on a two-year overhaul schedule and will not have an overhaul until 2010.

A - (Outage Report OR-2009-06)
4/20 – 4.0 days
The unit was taken off line for this planned outage due to increased pressure drop across the air heaters. The unit was on line for 127 days (3^{rd} longest unit run) and required an air heater wash. This is a common outage for this unit after over 3 months of continued operation. If the unit is out of service for other reasons, the air heaters are washed at that time so that a special unit outage is not required.

This was the first air heater wash since the new enamel cold end air heater baskets were installed in the fall 2008 overhaul. The enamel coating retards the buildup of ash on the air heaters thus increasing the time between required air heater washes. PSNH evaluated the performance of the air heater seals and found that they did not need replacement after 5 months of operation.

B
4/27 – 0.3 days
ISO-NE did not call for the unit after it returned to service from Outage A above. The unit was performing a cold start at this time. During startup, the turbine is run at 2,300 rpm until the reheater reaches 500^{o} F and the unit is held at these conditions according to the cold start curve until the turbine differential expansion (delta distance between the rotor and its casing) stabilizes. While the delta is generally in alarm during a cold start-up (above 0.032 inches), it crept towards the 0.036 inch trip point and the unit start was aborted. The turbine differential was allowed to decline, the heat soak was completed, and the unit phased on line. Also see Outage C below.

C
4/27 – 0.2 days
After being on line for one hour from Outage B above, but while still in start-up mode, the turbine differential expansion again alarmed. The unit was taken off line, the turbine expansion differential was allowed to decline, and the unit was rephased without incident.

PSNH states that it is not unusual to have differential expansion issues during a cold start-up. PSNH stated that they followed their start-up loading curves. No changes were made to the start-up curves or start-up procedures, but PSNH installed additional insulation to the turbine in an effort to accelerate the turbine casing expansion and improve the turbine differential expansion relationship.

D
5/27 – 0.9 days
The operator observed vibration in the 1B air heater motor. The vibration of the coupling was monitored for a couple of days. This outage was scheduled to be done at night and the coupling was replaced. In addition, the inboard forced draft fan bearing was also being monitored. That bearing was checked during this outage and found to be okay. The unit returned to service without incident.

E – (Outage Report 2009-10)
7/21 – 2.8 days
This outage was planned to take place prior to the MK-2 turbine outage to ensure maximum operability during that long outage. This outage is similar to what PSNH does prior to the summer season for operability improvement.

F - (Outage Report OR-2009-13)
10/26 – 4.2 days
The unit was taken off line for this planned outage due to increased pressure drop across the air heaters. This is a common outage for this unit after almost 3 months of continued operation. No other opportunity availed itself to perform the air heater wash in conjunction with another outage. During this outage, the boiler was inspected and leaks were repaired. Also during outage the 1LA and 1LB 480V load centers were replaced due to a high (level 4) arc flash risk.

G
11/2 – 0.4 days
The unit was requested to start by ISO-NE. During the previous outage, the oil operated air pilot valve was serviced. Upon completion of the service, the valve was tested to ensure proper operation. During this testing, some oil had leaked below the elevation of the oil operated air pilot valve onto the hot reheat, cold reheat, and main steam lines. The oil leak was cleaned up, but oil had seeped behind the cold reheat line lagging (metal sheet cover) seam and impregnated the inner insulation. During startup, this area began to smoke and the Bow Fire Department was called as a precaution. PSNH found that an approximate 4 foot section of insulation had been contaminated by the oil, the insulation was replaced, and the unit returned to service.

PSNH investigation found that the lagging used in this area is of an older style with two seams. Workers involved in the cleanup did not suspect that oil had seeped through the seam. Newer style lagging with one seam is now being used. PSNH identified other areas of two seam lagging and will replace targeted sections (sections that might be problematic if spilled upon) during the 2011 overhaul. PSNH also states that the replacement one seam lagging employed much better seaming technology so that orientation of the seam is not an issue.

H
11/1 – 0.2 days
The unit tripped due to loss of fires. Frances Harvey, the foundation contractor building foundations for the limestone silos for the clean air project, was bracing foundation forms and hit a 4.16kV cable with a hand installed bracing spike. PSNH investigation revealed that the presence of the 4.16kV cable in the area was discussed every morning at tailboard safety meetings except at the meeting held the morning of the incident. By coincidence, the day of the incident was the first day on the job for the individual who hit the power cable with the bracing spike. A new cable was installed and all capital costs and expenses were back charged to the contactor in a separate account. The contractor has since fully reimbursed PSNH for all costs except replacement power costs.

PSNH states that Dig Safe was called prior to construction, a Dig Safe ticket was issued, and that marking of the line was performed and maintained as required. PSNH investigated the outage and concluded that the incident was not reportable by itself or the contractor as the event occurred on private property, no personal injury occurred, and that the damaged facilities where those of PSNH.

It is Accion's understanding that all underground damage is reportable to Dig Safe as required in the PUC 800 Rules. In this case, both the contractor (as the excavator) and PSNH (as the operator) had reporting requirements under Dig Safe. This matter has been referred to the NHPUC Safety Division.

I – (Outage Report 2009-15)
12/1 – 3.4 days
The unit tripped due to tube leaks in the reheater section of the boiler. This section of the boiler is scheduled to be replaced during the 2010 major overhaul. Repairs were made and the unit returned to service.

Merrimack-2

The following outages occurred at Merrimack-2 during 2009. The major projects for this unit were the repair of the HP/IP turbine and the replacement of the horizontal reheater stubs. The reheater project was scheduled during the next major overhaul; however, PSNH was able to logistically bring this project back into the turbine repair outage to make that future outage more efficient. Other capital projects at MK-2 did not have adequate time to be rescheduled, but PSNH was able to schedule work required to tie in the clean air project during the turbine outage.

A - (Outage Report OR-2009-03)
2/12 – 4.6 days
The unit was removed from service to replace the portable exciter (rental unit) collector ring brushes following the recommendation of the vendor (Siemens). Other priority backlog work and work found necessary during the inspection of the boiler at the beginning of the outage were also completed. The collector ring brushes were replaced and the unit returned to service.

Accion notes that the "normal" exciter for MK-2 is a brushless exciter and does not require regular replacement of the collector ring brushes.

B
2/17 – 0.2 days
After starting up from Outage A above, a spike drop in the governor pressure occurred causing the governor valves to close and tripped the unit. PSNH investigation found nothing that would account for the spike and restarted the unit without incident. Siemens was engaged and they too found no cause for the spike. PSNH decided to take a thorough look at the issues during the next outage (See Outage C below)

C – (Outage Report OR 2009-04)
2/25 – 2.1 days
The unit was removed from service due to excessive water usage. Cyclones C, E, and G required repairs with the E cyclone requiring the most repairs. The cyclone leaks were repaired, and the unit returned to service.

Also during this outage (As noted in Outage B above), Siemens did a thorough examination of the governor and found minor rust and scale in the governor speed changer area that they believed may have caused the governor pressure spike. The governor speed changer area is open to the atmosphere which can account for the formation of the scale. The equipment was cleaned and no problems have been reported since. PSNH notes that this area was inspected during the 2010 overhaul and no issues were found.

D – (Outage Report OR 2009-05)
4/2 – 3.0 days
The unit was removed from service due to high vibration on the 2A forced draft fan. PSNH found that 1/3 of the inlet cone to the fan had failed and passed through the fan. Further investigation found additional cracks in the 2A forced draft inlet cone. PSNH

determined that the vibration was caused by an unbalanced air flow resulting from the missing inlet cone section. PSNH also determined that no damage had occurred to the 2A forced draft fan. Weld repairs were made to the inlet cone and the unit returned to service.

This inlet cone had been weld repaired in 2005, 2006, and 2007. No cracking was found during the 2008 inspection. Accion notes that PSNH replaced both the 2A forced draft fan inlet and outlet cones during the August 2009 MK-2 turbine outage.

E
4/6 – 0.5 days
The unit had phased returning to service from Outage D above. On the way to full load, PSNH found that the recirculation valve went to 60 percent open when it should have stayed at 100 percent open. This valve had been changed during the 2008 overhaul due to leak by problems. In Outage D above, new trim (moving parts) had been installed in this valve as, when full open, marginal flow existed. The new trim was to correct that issue without spring tension adjustment required. The old trim was reinstalled to get the unit back into service.

The valve manufacturer recommended an adjustment to the spring tension on the actuator. During a subsequent outage, the new trim and spring tension adjustment for the actuator were installed. The cause of the outage was determined to be that the new trim actuator needed adjustment for proper operation. The valve manufacturer performed all work at no cost.

F
4/22 – 0.5 days
The unit tripped due to a sudden pressure relay operation on the RT-2 running transformer. The transformer was checked and found to be okay. PSNH found that the sudden pressure relay had failed due to moisture intrusion into the relay. The relay was replaced and the unit returned to service.

Water intrusion should not be an issue for the sudden pressure relay as it is designed for outdoor operation. PSNH suspects that when the RT-2 transformer was replaced in 2005, that the relay was not properly installed at the factory. PSNH checked all sudden pressure relays of the same design at Merrimack and found all to be okay. Other stations were also made aware of the event.

G – (Outage Report OR-2009-08)
5/11 – 4.9 days
The unit was losing water due to boiler leaks. PSNH informed the ISO-NE that the unit would be coming down when an opportunity presented itself. PSNH secured replacement

power and took the unit off line. Leaks were found in the A, C, F, and G cyclones with the A and G cyclones requiring the most repair. During the outage, furnace wall leaks were also repaired. After the leaks were repaired, the unit returned to service.

Accion notes that MK-2 is on a one year overhaul schedule mainly due to the harsh environment in the cyclones. PSNH deferred the normal spring outage of MK-2 until August so that the 4 weeks of outage time could be saved by performing the overhaul in conjunction with the turbine replacement which could not be scheduled any earlier. PSNH realized from experience that there was a higher probability of cyclone outages to do so.

H – (Outage Report OR 2009-09)
6/26 – 2.1 days
The unit was taken out of service due to high water usage. PSNH found 5 leaks in the G cyclone and two minor leaks in the superheater floor. The leaks were repaired and the unit returned to service.

I
7/20 – 1.6 days
The unit was taken out of service due to high water usage. PSNH found leaks in the A and G cyclones. The leaks were repaired and the unit returned to service.

J
8/1 – 127.2 days
This outage is discussed in Exhibit MDC-3A.

K
12/6 – 0.0 days
The unit was returning to service from Outage J above when the operator noticed that the no load steam alarm was not clearing in its normal 15 to 30 second time frame. The operator tripped the generator breaker, preventing a full trip and longer unit down time. PSNH investigation found that the no load steam flow sensing valve steam line was in the closed position when it was supposed to be in the open position. The steam line was placed into the open position and the unit returned to service without incident.

The no load steam flow sensing valve is not part of the formal Merrimack lock-out tag-out equipment procedures. PSNH spoke to the Instrument Control Technician who recalibrated the valve during the outage and could not find another similar instance where a similar incident took place or a reason why opening the line was not performed. PSNH added a return to service check box to all its Instrument and Control calibration procedures. Accion views this incident to be an isolated employee error.

Evaluation (Except for Outage MK 2–J)

Accion 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 concluded that PSNH conducted proper management oversight during these outages.

Evaluation of Outage MK 2–J

The evaluation for this outage appears in Exhibit MDC-3A.

Merrimack 2009 Turbine Repair Outage

Merrimack-2

The following outage occurred at Merrimack-2 during 2009, was the major project for this unit in 2009, and centered on the repair of the HP/IP turbine. PSNH extended the annual over haul of Unit-2 from the spring of 2009 until the fall of 2009 which allowed for logistical support both at PSNH and at Siemens to support the outage to take place. In addition to the repair of the HP/IP turbine, PSNH was able to bring forward the replacement of the horizontal reheater stubs which was scheduled during the next major overhaul (a 4 week project in itself). The movement of this major critical path project back into the turbine repair outage made that future outage more efficient by shortening its duration. Other future major capital projects at MK-2 did not have adequate time to be rescheduled into this outage.

J
8/1 – 127.2 days
This outage was scheduled to perform repairs to the HP/IP turbine which was damaged by foreign material when installed in 2008. Prior to the outage and during the outage, PSNH increased employee and contractor awareness regarding formal material exclusion issues. In addition, PSNH hired a third party whose sole duty was to address foreign material intrusion into the unit through out the outage.

The turbine outage was scheduled with an ISO-NE window of 8/1/09 through 12/7/09 and with the turbine on critical path for the entire outage. Siemens had contracted to have the HP/IP turbine and associated components shipped from Siemens by 11/16/09. With the contracted delivery of the HP/IP turbine dates, PSNH schedule showed that the unit would phase to the system on 12/3/09. The actual schedule resulted in a return to service date of 12/6/09 due to start up problems discussed below.

With the duration of the outage determined by the contractual delivery of the HP/IP turbine, PSNH was able to contain the cost of the outage at the approximate cost of the regularly scheduled spring 4-week annual overhaul by performing virtually all work not on critical path at straight time rates without paying overtime and weekend salary premiums.

Accion notes that during this outage, the Merrimack-2 rental exciter was removed and replaced with the Siemens exciter from the seed exciter program which was actually the Newington exciter refurbished as part of the Siemens seed exciter program (Merrimack-2 and Newington have the exact same exciter).

HP/IP turbine components were guaranteed to ship from Siemens by 11/16/09. Siemens formally advised PSNH of changes to the return dates for the HP/IP turbine and associated components at least twice a week as changes took place at the Siemen's plant on the PSNH work and its relationship with the multitude of similar projects being performed in tandem with the PSNH work including the two LP rotors. A similar process was conducted for the LP turbine components which were not on critical path and scheduled to be returned earlier. In parallel, the Siemens transportation department which is dedicated to secure road routes and permits for the heavy loads updated transportation requirements so that PSNH would have arrival dates of the various components that utilize available transport days efficiently. As Siemens gave these updated delivery dates to PSNH, Siemens continued to stress that guaranteed ship dates remained as contracted and the potential ship dates reported to PSNH on an ongoing basis were not guaranteed.

During the course of the outage, Siemens revised the HP/IP ship dates many times moving the anticipated ship date as far forward as 11/6/09 for some components (the final HP/IP turbine component was actually shipped on 11/10/09). PSNH responded by adjusting its extremely flexible work schedule to accommodate the early return of the HP/IP turbine components and on 11/22/09 was 303 hours ahead of the original PSNH schedule (384 hours ahead of the ISO-NE schedule).

After the HP/IP turbine components were installed, start up activities began. The unit start-up activities began on Saturday 11/21/09, well ahead of schedule. During startup when the unit was rotating at 2700 rpm, the exciter bearing #9 went into high temperature alarm and the operators tripped the unit. Investigation found that the bearing had wiped (tin based bearing material reaches melting temperature thus ruining the bearing) due to high temperature. The bearing was required to be sent off site to Siemens for repair and became critical path until 11/28/09 when the start up boiler feed pump halted start up activities (See details below). Accion notes that the #9 bearing was a package component of the exciter replacement.

Siemens made its best efforts to expedite the PSNH work. For example, when the LP rotors were opened and inspected after work was well along on the critical path HP/IP turbine (Siemens has only one gantry crane), it was found that blade repairs were required. Siemens had developed contingency plans for repairs not identified by visual inspection prior to leaving Merrimack Station. Another instance where Siemens responded to maintain the shortest turn around time possible was when the blades for the HP/IP turbine were being assembled. All blades had been dimensionally checked upon fabrication and were within tolerance. What was noticed during assembly and another dimensional check was that a portion of some blades were at the high end of their tolerance. Blade assembly continued with dimensional checks, and Siemens manufactured one row of blades in parallel with the assembly work in case blade tolerances were not maintained. None of the extra blades were required and the blades are located at the PSNH warehouse.

The exciter bearing is required to have a 10 mil clearance. Siemen's shop records indicate that the beariung had a 10 mil clearance. PSNH measurements indicated that the bearing had only a 4 mil clearance from measurements of the lost material in the bearing. Strong push back from PSNH resulted in Siemens absorbing all the costs of this repair.

During the 11/21/09 start up activities, a vibration was noted in the start up boiler feed pump. The start up boiler feed pump had been serviced by Siemens during the 2008 annual overhaul. The vibration was not large enough to curtail start up activities at that time. Testing revealed that the vibration of the start up boiler feed pump was 8 mils which is a value higher than desired but below the tolerance level of 12 mils. Because the exciter bearing had failed and unit start up was delayed, that and a spare balance drum for the start up boiler feed pump was in stock, PSNH took the opportunity to replace the balance drum at this time as a precautionary action. The pump work was completed on 11/26/09.

Start up activities began again on 11/27/09 with the installation of the repaired #9 exciter bearing. Six hours into start up, the vibration on the recently repaired start up boiler feed pump increased to 19 mils and the unit was taken off line. On 11/28/09, investigation found that the start up boiler feed pump balance drum was damaged beyond repair because a metallic O-ring was not installed during assembly during the overhaul by Siemens. Siemens personnel had just plainly missed the installation of the O-ring. At this point in time the start up boiler feed pump path became critical path.

PSNH installed its second balance drum from stock and required direct supervision of a Siemens field engineer. Concurrently, PSNH ordered two additional balance drums (one each from two fabricators) on an expedited basis. Testing revealed that the start up boiler feed pump had a vibration of 9 mils with the new balance drum installed. Investigation found that the balance drum's rotating components had made contact with its stationary components and was damaged beyond repair.

In addition to the fabrication of new balance drums, PSNH requested that Siemens search its customer base for a balance drum to reduce the outage time below what it would otherwise be if it waited for expedited fabrication. Siemens found a suitable balance drum at an idle facility in Texas and had it shipped to Merrimack station on an expedited basis. In the repair process, PSNH also replaced the pump's rotating element (to rule out any potential issue with that component) with a spare. The start up boiler fed pump remained critical path until 12/5/09 when a successful test of the start up boiler feed pump was made. Start up activities commenced on 12/5/09 and the unit phased on 12/6/09 without incident.

Evaluation for MK-2 – J

Accion reviewed the outage above and found it 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 during this outage.

PSNH was reimbursed for time and material costs related to 2 out of the 3 repairs to the start up boiler feed pump because one repair was required without Siemens workmanship issues. PSNH's insurance policy covered the replacement power costs of any extension of the HP/IP repair outage resulting from the problems with the start up boiler feed pump.

Accion understands that discussions have taken place between PSNH and Siemens regarding Siemens workmanship issues. Accion recommends that PSNH file a report with the Commission within one month after the issuance of a final order in this docket describing the efforts taken and results achieved in addressing workmanship issues.

Newington Outages For 2009

Newington-1

The major projects for Newington in 2009 were the removal and inspection of the station's 6 largest motors and two of its medium sized motors. For 2009, Newington's overall availability was about 95 percent and in excess of 97 percent excluding planned maintenance. For 2009, Newington's capacity factor was approximately 6 percent. Historically Newington's heat rate has been between 11,500 Btu/kWh and 12,300 Btu/kWh. In 2009, the unit heat rate was approximately 12,400 Btu/kWh. Newington's full load heat rate is approximately 10,800 Btu/kWh. The increase in heat rate is due to the manner in which the unit is operated.

The following outages took place at Newington during 2009:

A
1/8 – 0.1 days
The unit tripped due to a boiler pressure excursion during startup. The induced draft fan was started and the boiler excursion occurred during the startup of the forced draft fan. Newington installed 2 new electric drives for the induced and forced draft fans in 2008 to replace aging pneumatic controls. The fan controls were tuned when the unit was cold in December of 2008, but were not fine tuned when the unit was running hot due to unit economics at that time. PSNH considered the cold condition tuning to be close to final tuning values and decided not to expend the money for a full start up of the unit to do so. In January of 2009, the unit was in startup when the incident occurred. Adjustments were made to the forced and induced fan controls and the unit returned to service.

B
3/6 – 12.5 days
This was a planned outage to perform the annual inspection and overhaul of the unit, was scheduled for 24 days with the ISO, and was completed in just over 12 days per PSNH's internal schedule. During this outage, both forced draft fan motors, both induced draft fan motors, and both circulating pump motors were sent out for a complete inspection. In addition, the "B" train condensate pump and closed cooling water pump motors were sent out for inspection. During the outage, as a result of the problems found with the "B" condensate pump motor, the "A" condensate pump motor was sent out for inspection and also found to have cracked bar connections. This was the second year that crack in the rotor bar connection straps of the "A" motor were found. PSNH ordered a spare condensate pump motor after the outage.

The “B” closed cooling water pump motor had a low megger reading when inspected. The low megger reading either was a result of the motor picking up moisture during transit, or the cracks found in the motor lead during inspection. The cracked motor lead was replaced at the motor shop and PSNH is reviewing motor protection practices during transit. Employees are required to inspect motors for weather protection prior to shipment. The cracked motor lead most the most likely cause. Motor repairs were the critical path for the outage. The additional repair of the “A” condensate pump motor did not add time to the critical path of the outage. Some motors were returned early from the motor shop, but their early return also had no critical path impact.

During the outage, seven expansion joints were replaced in the precipitator, Section B03 of the 480V AC critical AC Bus distribution panel board was replaced (unrelated to flash hazard issue), and other cleaning, inspection, and non-destructive examination tasks were performed.

C
6/25 – 0.3 days
The unit was being operated to make ready for availability to run in the summer market. A leak developed in the main steam valve packing. The unit had not run since the annual inspection in March and a full start was not done at that time, however all major systems worked on were sufficiently tested to ensure operation. The main steam valve was not worked on during the annual outage. Since the annual inspection, fires were put into the boiler at two week intervals to assure personnel readiness. The unit was cooled, the packing was replaced, and the unit returned to service.

The packing material for the main steam valve has been in use for 35 years. However, PSNH contacted the packing supplier and has since changed the packing material to one that is moister and thought to be longer lasting.

D
8/18 – 0.2 days
The unit was operating on 100 percent gas and following load when the main gas control valve stopped responding. The boiler master control called for more fuel and none was forthcoming. The unit tripped on low drum level as a result. PSNH determined that the valve signal was verified and repeatedly stroked the main gas control valve noting that it stroked slowly at first. PSNH suspects a speck of debris was in the valve’s pneumatic positioner although no debris (or determination of cause) was ever found. The valve positioner was cycled several times and it is suspected that any debris cleared the positioner valve ports. The unit returned to service.

Accion notes that PSNH has since bought an electric master fuel control valve to replace the pneumatic valve because of improved reliability and valve position feedback for the operator.

E

10/6 – 5.6 days

The unit was taken out of service on planned maintenance to perform safety work. OSHA has promulgated new standards to calculate the arc flash potential of electrical equipment requiring adherence to IEEE equations as presented in NFPA70E-2004 (National Fire Protection Association). Studies were required at all PSNH generating stations, and the Newington evaluation was completed after the annual inspection. The results of the Newington analysis showed that there were five electrical busses that had a high potential for arc flash with potential catastrophic results, are considered dangerous, and mitigation techniques could not be implemented. PSNH could not wait to perform this safety work until the next annual outage, so it was scheduled as soon as possible. Administrative controls were put into place to protect personnel until the outage could be taken. Prior to this outage, PSNH determined that the lube oil piping to the induced draft fan was leaking and needed replacement. That work was also performed during this outage.

F

10/21 – 0.1 days

The unit tripped on low drum level during a cold startup. Normally during unit startup, the unit will phase and the drum pressure drops and stabilizes when under automatic control. During this startup, the unit tripped. PSNH investigation could not find anything wrong. The unit was restarted and phased without incident (See Outage G below). PSNH noted that similar, but less severe, low drum pressure indications were observed during startup. PSNH continued to investigate the problem as the unit was brought back on line. The problem was traced to the startup boiler feed pump recirculation valve. The valve was subsequently repaired (See Outage H below).

G

10/21 – 0.1 days

The unit was in the startup process to go to full load after returning to service from Outage F above. While preparing to put the fourth burner in service, one of the operating burners tripped causing a gas pressure increase in the other burners. The pressure increase resulted because the fuel control system was still calling for the same volume of gas. The boiler control system limits gas pressure. The high limit gas pressure setting was set to 14 psi by Emerson during the recent control system replacement. Gas pressure reached 16 psi during this event. When the high limit was reached, the flow control valve automatically closed to reduce pressure. When the flow control valve closed, the boiler pressure began to oscillate and eventually tripped on low drum level. PSNH noted that such an event had never occurred at Newington for the loss of a single burner. With that knowledge, PSNH reset the gas pressure to 20 psi and continued to start the unit.

Subsequently, PSNH more thoroughly reviewed gas pressures for burner loss during startup and again reset the gas pressure high limit to 21 psi. The PSNH analysis showed that if 2 burners were lost out of 4, the gas pressure remains below the 21 psi gas pressure high limit.

H
10/21 – 0.1 days
During startup from Outage G above, the unit tripped on low drum pressure in a similar manner as in Outage F described above. The Feedwater controls were placed on manual operation, water was force fed into the boiler at peak water level (to avoid a unit trip), and when the drum level got to the drum set point, the feedwater control valve was placed in automatic operation. The feedwater control valve operated properly and controlled the unit. PSNH investigation (this is the more thorough investigation referred to in Outage F above) found that the startup boiler feed water recirculation valve (required to maintain a minimum flow through the feedwater pump) was leaking water by, thus robbing flow to the boiler drum. The valve was repaired.

I
11/6 – 0.2 days
The unit had operated the day before and shut down at 10:30 at night. When the "A" induced draft fan shut down, it did not go onto turning gear as it should have. PSNH uses turning gear here for conservatism, but it is only required for 90 minutes prior to starting the motor. This mode of operation minimizes the amount of time required for a restart of the motor. The event alarmed and PSNH verified that the motor was not on turning gear. PSNH found that shear pins had failed between the coupling and the motor. PSNH was in the process of fixing the "A" shear pins and was required to start the unit. The "B" induced draft fan was used to start the unit. When the "B" induced draft fan started, the unit tripped on high furnace pressure. PSNH investigation found that one inlet vein control circuit board was bad and replaced the circuit board. The work on the "A" induced draft fan was completed sooner than the work on the "B" fan and the "A" fan was used to start the unit.

J
12/2 – 0.1 days
During startup, the exciter field breaker was closed at 3,600 rpm and the unit tripped with a late phase (timing delay) indication. A communication problem in the voltage regulator was indicated. In the voltage regulator, a "mother" board and 2 "daughter" boards control

adjust the voltage base adjuster that tunes the voltage on the generator. Specifically, the "mother" board and one of the "daughter" boards are required to control the base adjuster. The manufacturer was consulted and recommended that the system be given a hard reboot. The hard reboot was performed, the communication problem cleared, and the unit was started. Subsequently, PSNH has made a hard reboot part of its procedure in responding to this alarm.

K

12/13 – 1.7 days

ISO-NE requested that Newington remain in operation on a Friday night. The unit ran all day Saturday and into Sunday, developed a condenser leak early Sunday morning, and was taken off line. PSNH observed that contamination occurred quickly indicating that the leak was significant. PSNH verified intrusion into the condenser and its investigation found that 3 stoppers plugging previous leaking condenser tubes were loose. PSNH soaped the tubes and did not find the leak so that the loose stoppers did not account for the leak. PSNH then used florescent dye and black lights to find the leak, but none was found. The loose stoppers were tightened, one was replaced, and the unit was put back into service without incident.

Subsequently during the 2010 annual inspection, the condenser tubes were eddy current tested for wall thickness and all were found to be serviceable. PSNH has retained a consultant expert in this matter and has scheduled additional testing for October 2010.

Evaluation for Newington

Accion 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 concluded that PSNH conducted proper management oversight during these outages.

Schiller Unit Outages For 2009

Schiller-4

The following outages occurred at Schiller-4 during 2009.

A – (Outage Report OR 2009-01)
1/5 – 5.1 days
The unit tripped off line due to the failure of a generator tube. The failure was caused by external corrosion and was particularly violent and damaged approximately 30 feet of refractory. PSNH stated that new generator tubes were installed in 1984 when the unit was converted back to coal operation. Failures of the generator tubes started in the 1990s and PSNH believes that the fly ash composition of the coal used at that time plus fly ash reinjection is the cause. PSNH no longer reinjects fly ash unless the fly ash disposal system has a problem. Repairs were made and the unit returned to service.

B
3/3 – 3.9 days
The unit tripped due to a failure of a generator tube. Repairs were made and the unit returned to service.

C
6/10 – 2.5 days
The unit was on reserve shut down status at the time. PSNH took a maintenance outage to inspect the boiler. Tube repairs were made and the unit returned to service.

D
7/21 – 1.0 day
This outage and Outage 6-F below were initiated by the events described in Outage 5-D which is explained below.

E – (Outage Report OR 2009-16)
12/8 – 4.8 days
The unit tripped due to a rupture of a generator tube and adjacent tubes were damaged. An approximate 18 foot section of the generator tube was replaced, damaged tubes repaired, and the unit returned to service.

F
12/15 – 0.4 days
Units 4 and 6 use a pneumatic system to transport fly ash to the silo. Valves dump the fly ash into the transport system. PSNH noticed that fly ash was not getting to the silo and took the unit off line. PSNH investigation found that the pipe was plugged. One of the dump valves had a piece fall off and plugged the pipe due to erosion in the fly ash environment. The worn components were replaced, the pluggage was cleared, and the unit returned to service.

PSNH noted that the dump valves for Unit 6 were replaced in 2009 and the dump valves for Unit 4 were replaced in 2010.

Schiller-5

The following outages occurred at Schiller-5 during 2009.

A - (Outage Report OR-2009-02)
1/26 – 4.6 days
The unit was taken off line due to low air flow causing the bed temperature to decrease which in turn allowed the bed to agglomerate (crust over). Air heater leaks (See also Outage H on 12/7 2008) caused high currents in both the forced draft fan and the induced draft fan motors. In order to control fan loading, unit output was reduced. Running at reduced loads tends to cause the bed material to crust. The bed material was replaced, repairs were made, and the unit returned to service.

B
3/29 – 23.0 days
This outage was the planned annual overhaul for the unit. The ISO-NE outage window was 31 days from 4/3 to 5/4, the PSNH schedule was 24 days from 4/3 to 4/27, and the actual outage time was 23 days from 3/29 to 4/21. Initial critical path for the outage was modification to the control system. Major projects included during the outage were the replacement of over 3,500 air heater tubes and the replacement of over 2,800 fabric bags in the bag house. During the outage, PSNH found significant wear in the cyclone wall refractory (where bed sand is separated from wood chips) and the replacement of one cyclone refractory wall became critical path until the end of the outage. The unit came off line early due to bed crusting issues. PSNH had anticipated that the unit might come off line prior to schedule, prepared for an early outage start, and no time was lost. The outage went smoothly and the unit returned to service.

C

5/19 – 0.1 days

PSNH personnel went to rack out an air compressor breaker and when they did, the adjacent breaker (MCC 101) tripped. The MCC 101 breaker operation tripped the unit as the function on that breaker is required to run the unit (Motor control center). PSNH could find no explanation why the breaker tripped but suspects vibration from operation of the adjacent breaker was the cause. PSNH replaced the breaker rather than to investigate the cause because the investigation would take a longer period of time, required that the unit be out of service, and the cost of the breaker is small. The unit returned to service without incident.

D

7/18 – 0.3 days

The explanation of this outage also explains Outage 4-D above and Outage 6-F below as they are related.

On Saturday 7/18, the unit tripped due to a bad Volt/Hertz relay power supply card in the exciter. Both Unit 4 and Unit 6 were on reserve shutdown. Unit 6 was scheduled for a minor maintenance outage on Monday 7/20 to repair a hydrogen cooler leak. All the Schiller exciters are identical. PSNH declared Unit 6 on outage on Saturday and used its relay power supply card for Unit 5 as Unit 5 is more economical to operate. Unit 5 returned to service on Saturday 7/18. In order to return to service, Unit 4 was fired up to produce auxiliary steam.

A leak developed on a Unit 4 safety valve flange. The unit was taken out of service on Tuesday 7/21 and the relay power supply card from Unit 4 was installed in Unit 6 which returned to service on Tuesday 7/21. Unit 4 returned to service on Wednesday 7/22 when a new card was obtained.

E

7/18 – 0.5 days

Coming back on line from Outage D above on Saturday, the unit had to supply its own auxiliary steam (Needed for start-up operations) Unit 4 and Unit 6 were both off line. A high drum level was experienced because an unstable deaerator pressure did not allow a stable feed flow to be maintained which in turn caused the unit to come off line until another unit could be started to supply auxiliary steam. As explained in Outage D above, Unit 4 was started and used to supply the auxiliary steam.

PSNH was aware of the insufficient auxiliary steam issue from previous events. PSNH made modifications the Unit-5 control valve to address this issue, tested the valve to the extent it could, but could not test the valve operation under actual operating conditions.

This was the first occasion where PSNH could verify their contemplated solution to the auxiliary steam issue.

PSNH notes that it is evaluating the installation of a new control valve with greater flow pass capability that would prevent this issue from occurring in the future.

F
10/1 – 0.1 days
The unit had been on a long run and the bed temperature began to fluctuate due to the failure of the bed removal valve, V-112. This valve is used to add or take away bed material. In this case, the valve failed such that bed material could be added, but bed material could only be removed very slowly. Valve operation in this reduced capacity is adequate unless you have a boiler excursion such as a fuel event. The unit had a fuel excursion and the unit tripped. Operators tried to bring the unit back on line but soon realized that the bed had agglomerated resulting in Outage G below.

G - (Outage Report OR-2009-11)
10/1 – 4.8 days
The unit was taken off line due to bed agglomeration. The unit had run for 166 days since the spring overhaul with 4 unit trips. Bed material was changed, the valve was repaired, and the unit returned to service.

PSNH notes that the V-112 valve was replaced with a valve of improved design during the spring 2010 outage and the unit returned to service.

H
11/4 – 0.2 days
The unit tripped due to the trip of the forced draft fan. PSNH investigation found that the forced draft fan trip was a result of a faulty vibration probe on the forced draft fan. All other fans go to alarm for similar conditions. PSNH changed the logic for the failure of the forced draft fan vibration probe to alarm rather than trip. The switch was replaced, the logic was changed, and the unit returned to service.

PSNH noted that Alstom had set up the trip logic for this fan and that it was different than the trip logic for the other fans. The changes made by PSNH made all trip logics identical (Alarm rather than trip mode).

I
11/19 – 0.6 days
The V-112 bed material removal valve failed again. This valve removes 1,500 degree sand from the bed. Condenser cleaning was required and this action required the unit load to be reduced to approximately 50% loading. Upon reducing load, it was evident that the

V-112 valve had again failed and bed material could not be removed. When the valve failure was recognized, the unit was taken off line electrically. The valve was repaired and the unit returned to service.

PSNH noted that the V-112 valve was replaced with one of a new design in 2010.

J - (Outage Report OR-2009-14)
11/20 – 4.2 days
The unit was taken off line due to low bed temperatures and bed agglomeration that had occurred during the excursion experienced the previous day. The bed temperature did not recover from the boiler upset in Outage I above indicating agglomeration. Bed material was replaced and the unit returned to service.

PSNH stated that bed thermocouples indicated that a problem had occurred during the condenser cleaning in Outage I above. Instead of initiating an immediate shut down, an attempt was made to recover the bed temperature. The effort was unsuccessful requiring the unit to be taken off line.

K - (Outage Report OR-2009-17)
12/13 – 4.2 days
This planned maintenance outage was taken to perform repairs to the attemperator (sprays feedwater to steam) and main steam valves which were problematic, perform condenser cleaning which was eminent, and to inspect the cyclones. PSNH cleaned pluggage from the cyclones, cleaned seasonal debris from the condenser, repaired the main steam valve, and rebuilt the attemperator valve. The unit returned to service after work was completed.

L
12/31 – 0.1 days
The unit tripped due to high boiler pressure. The bag house for the unit has 8 compartments. Each compartment has a poppet valve (Isolates bag house section from the flue gases) that sequentially closes and air is injected to clean the bags. In this instance, all 8 valves closed at once causing the unit to trip. PSNH found a blown fuse which explained the outage. The fuse was replaced and the unit returned to service.

PSNH notes that the same fuse has blown since this event without similar consequences. Such action indicates that the fuse was not the cause of the instant outage. The cause of the blown fuse and the outage remains undetermined

Schiller-6

The following outages took place at Schiller-6 during 2009:

A
4/2 – 0.4 days
The unit was taken out of service when a fire broke out on the outside of burner #2. The unit was on oil at the time and PSNH did not know what was feeding the fire. PSNH investigation found the nozzle fouled due to accumulated oil drip. Repairs were made and the unit returned to service.

PSNH noted that even though operators conduct burner checks on each shift, that the physical location of burner #2 is between Burners #1 and #3 and required the operator to see past the flames of those burners. In addition, if burners are in operation in excess of 24 hours, they must be pulled for cleaning and inspection on each 12-hour shift. In this instance the #2 burner was not pulled on the prior shift as it had not been in operation for 24 hours. PSNH is conducting a review of historical fouling to determine if procedural changes are warranted.

B
4/11 – 0.0 days
The unit was at reduced load and preventative maintenance was being performed on one of the two flame scanner blowers (blows air to keep the fire eye clean). The north blower was shut down TO clean the filter and hot gas came out of the burner when the filter was removed. The operator restarted the blower for his own protection without the filter and dirt was sucked into the burner. The unit tripped at this point as only 1 fire eye failure indication is needed to trip the unit at low load. Two fire eye failure indications are needed for a trip when at full load. PSNH investigation found a faulty check valve that allowed the hot gas to exit the burner. The valve was replaced and the unit returned to service.

C- (Outage Report OR-2009-07)
5/4 – 4.3 days
The unit was removed from service when an operator noticed a waterwall tube leak near one of the soot blowers. The soot blower goes into the burner and blows steam back at the wall tubes. If the soot blower does not fully insert as was the case in this instance, the blast pressure on the tubes is higher thus causing the leak. PSNH also found worn tubes in the area of the leak and the soot blower. The tube leak and other worn tubes were repaired and the unit returned to service. PSNH noted that all soot blowers were maintained during the fall 2008 overhaul.

D

6/30 – 1.0 day

The unit was taken off line due to a hydrogen cooler leak PSNH investigation found three leaking tubes. The tubes were plugged and the unit returned to service.

E

7/6 – 1.2 days

The unit was taken off line due to high conductivity of the boiler water (pure water does not conduct electricity). The high conductivity indicated that there was a leak in the condenser. PSNH conducted a dye test without finding any leaks. PSNH then conducted a soap bubble test and found one small leak. The tube was plugged and the unit returned to service. PSNH noted that approximately 10% of the condenser tubes in the areas of the failure were eddy current tested (determines wall thickness) during the fall 2008 overhaul and no thinning was noted.

F

7/18 – 3.2 days

This outage and Outage 4-D above were initiated by the events described in Outage 5-D which is explained above.

G

8/12 – 2.2 days

During his rounds, an operator heard a tube leak in the primary super heater. Unit operation was managed until a more economic time was available to take the unit down. PSNH investigation found 3 tubes damaged by erosion. Repairs were made and the unit returned to service.

H

8/18 – 2.0 days

The unit tripped due to a generator tube leak. Rather than fully repair the generator tube, PSNH shortened the outage and plugged the tube instead. PSNH plugged the tube as the unit was coming down for its 18 month overhaul in 10 day's time and was not prepared to start the outage this early. The unit returned to service and ran until its planned overhaul in Outage I below.

I

8/28 – 37.1 days

This outage was the planned overhaul for the unit. The ISO-NE outage window was 38 days from 8/28 to 10/5, the PSNH schedule was 37 days from 8/28 to 10/4, and the actual outage time was 37 days from 8/28 to 10/4. The critical path for the outage was replacement of HP turbine blades which remained on critical path until the turbine was returned from Siemens. At that point, turbine installation, and boiler start up activities became critical path until the unit was returned to service. The outage went smoothly and the unit returned to service.

J
10/6 – 0.1 days
The unit was returning to service from Outage I above and was being fired on oil. The burner management system would not let the operator switch from oil to coal. During the overhaul just completed, the burner management system (No longer supported by Allen Bradley) was upgraded to the latest model including control logic. Much of the input/output logic could be checked off line, but some of the more complex logic could not be checked out until the unit was in service. In addition, logic changes to the burner management system cannot be made unless the controller is in program mode rather than run mode. The logic changes were made and the unity returned to service without incident.

K
11/27 – 2.1 days
When the unit was being started when called by the ISO-NE to operate, water was coming out of the air heater hoppers and the start up was halted. PSNH investigation found that 2 rolls at the mud drum and 4 rolls at the steam drum were leaking. PSNH has had problems in maintaining good seals with the rolls on these drums and now makes weld repairs instead of making roll repairs. An additional hydro test found that 4 more rolls on the mud drum needed to be weld repaired. Repairs were made and the unit returned to service.

L
12/1 – 0.0 days
The unit had been in reserve shut down. When starting the unit, the operator put the voltage regulator switch in the auto position (so that AC and DC voltages are matched) and when the voltage regulator was put into auto mode, the unit tripped. The starting sequence was repeated and the unit started without incident. PSNH investigated the incident, found that the starting sequence was correct, and found nothing that could explain what caused the unit trip. PSNH noted that a similar incident has not occurred since this outage.

Evaluation

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

Recommendations

Related to Outage SCH 4-D, Outage SCH 5-D, and Outage SCH 6-F

With market energy prices depressed in the ISO-NE market, PSNH units have become subject to reserve shutdowns where they are not economic to run, but able to do so. In these circumstances, PSNH strives to do as much repair work during normal straight time hours to minimize operating costs. At times, expenditures of overtime might be beneficial. Accion recommends that PSNH review its policy and practices regarding overtime expenditures versus reserve shutdown on unit-by-unit basis at all of its major stations to ensure that units are in an operational state that maximizes customer benefits.

Related to Outage SCH 6-H

There are many considerations that must be made to make the decision to start a planned outage early. Some of which are contractor availability, material availability, market price, cause of the outage, time between the outage and the planned outage, status of other economical units, day of the week the outage occurs, and the ability to gain ISO-NE approval for the schedule change. In addition, each unit has its own characteristics that can influence how early a planned outage can be started such as start-up and shut-down times. Once a decision is made to start an outage early, PSNH should be in a position that maximizes its ability to start an outage early if that is the correct decision for the conditions presented in that outage. If not, outage time may be increased. Because of unit differences, Accion believes that the amount of time that a planned outage could be started early varies by unit. Accion recommends that PSNH review its practices etc. on its ability to start planned outages early on a unit-by-unit basis to ensure that it maximizes the ability to do so while minimizing potential increase in outage duration.

Hydroelectric Unit Outages For 2009

The following describes the outages at PSNH's hydroelectric (hydro) units during 2009. The outage durations listed have been stated as the actual duration of the total outage regardless whether there was water to run the unit. Accion indicates water availability during any portion of the outage by a "Y" or "N" next to the outage designation.

In 2009, due to the increased rainfall experienced, the PSNH hydro fleet generated 413,300 MWH of energy, 21.6 percent more than an average water year. The increase in water flow required that maintenance schedules and work plans be shifted to accommodate additional flow wherever possible.

Amoskeag Station

Major planned projects at this station in 2009 included the installation of a new portage take-out area, the finishing of the dam resurfacing project, and the beginning of the G-2 generator rewind which continued into 2010.

Amoskeag - 1

A
1/26 – 4.16 days – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

B – (Related to a T&D event)
7/27 – 0.08 days – Y
The unit tripped and locked out when lightning struck the 312 34.5kV line between the Eddy and Blaine Street substations. PSNH noted that a line crew had to remove a picnic table umbrella from the primaries at the Blaine Street Substation before the line could be re-energized indicating that either could be the cause for the line trip. Line operation was proper, however, the Amoskeag unit tripped when it should not have. PSNH stated that the under voltage relays at the hydro plants across the system where found to be set approximately 33% higher than they should be making the units more susceptible to trips for remote faults. The Relays at Amoskeag were not reset until the fall of 2009.

C – (Related to a T&D event)
8/20 – 0.08 days – Y
The unit was taken off line to perform emergency system repairs. The 0354 34.5kV circuit breaker at Eddy Substation had a leaking oil valve and this line is the sole system interconnection for Amoskeag Station. PSNH considered reconfiguration of the system to keep

the hydros on during the repair, but determined that reconfiguration would be too extensive and place customers in a less desirable configuration from an outage stand point. Repairs were made to the valve and the unit returned to service. Please also see Outage-3C below.

D
12/9 – 0.02 days – Y
This planned outage was taken to perform the ISO-NE annual required Black Start test for the unit. The test was completed and the unit returned to service.

Amoskeag – 2

A
2/2 – 4.21 days – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

The generator was found to be very dirty and a fall outage was planned to thoroughly clean the unit. Please see Outage-C below.

B
9/13 – 0.04 days – Y
The unit tripped off line due to a high lower guide bearing temperature. PSNH investigation found that the lower guide bearing sump level was low because the lower guide bearing oil pump on and off Mercoid switch (Brand name mechanical level indicator switch) had stuck in the off position. The pump started when the operator touched the switch. Both Mercoid switches and those on G-2 and G-1 and G-3 were lubricated and the unit returned to service. PSNH noted that all Mercoid switches are cleaned and lubed during the unit's annual inspection. PSNH also noted that there have been no historical problems of this nature and that none have occurred since.

C
11/23– 38.69 days – Y (Days out of service are to the end of the year – Outage ended 5/13/10)
This planned outage was scheduled for 5 weeks to do the through cleaning discussed in Outage A above. When the unit was disassembled and inspected, it found that a generator rewind and core restacking was required.

PSNH noted that it wanted to do a generator rewind in 2008, but dam resurfacing work at that time required that all 3 units remain in operation in order to keep the pond level reduced to facilitate the dam resurfacing project and not to waste water. PSNH decided to monitor the unit and not waste the water.

It has been convention to analyze an over lapping outage in the year where the majority of the outage occurs. Where the majority of the outage occurs in 2010, it will be analyzed during the 2010 SCRC review.

Amoskeag – 3

A
2/9 – 4.08 – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

B
7/21 – 0.44 days – N
The unit tripped off line due to the failure of the governor control coil. PSNH noted that all coils are tested during the annual inspection. The coil was replaced and the unit returned to service.

C – (Related to a T&D event)
8/21 – 0.13 days – Y
The description of this outage is identical to that of Outage 1-C above.

D
11/22 – 0.70 days – Y
The unit tripped due to the failure of the field control coil. A spare coil was tested and it too failed tests. Where G-2 was scheduled to shut down for cleaning, its coil was removed and installed in G-3 and the unit returned to service. A new coil was subsequently ordered and installed in G-2.

PSNH states that spare parts were stored at Garvins Hydro in an uncontrolled environment. PSNH suspects that the quality of the spare coil deteriorated in storage. With the replacement of the generator step-up transformers with a unit of much smaller size at Garvins, PSNH has since set up a formal storage room for spare hydro parts at that location.

E
12/9 – 0.02 days – Y
The description of this outage is identical to that of Outage 1-D above.

Ayer's Island

Major projects at Ayer's Island for 2009 included the replacement of the TB-19 circuit breaker and disconnect switch, replacement of unreliable brown glass station insulators, installation of animal guards throughout the substation, and extensive discussions with the FERC regarding changing earthquake remediation measures.

Ayer's Island – 1

A
3/11 – 0.02 days – Y
The unit was taken off line to replace two worn collector ring brushes observed by the operator during his weekly rounds. The brushes were not worn to the point where they were arcing, but arcing was eminent. The brushes were replaced, other brushes were cleaned, and the unit returned to service.

PSNH noted that brushes in the other units were not cleaned at this time as brush replacement is an on going requirement. Normally brushes are replaced during other events, but will only last approximately 4 months if a replacement opportunity window does not appear.

B
4/3 – 0.01 days – N
The unit was taken off line to replace one worn collector ring brush observed by the operator during his weekly rounds. The brushes were not worn to the point where they were arcing. The brush was replaced, other brushes were cleaned, and the unit returned to service.

PSNH noted that early 2009 was a heavy water period and there were not many opportunities to replace brushes when the units were not running.

C – (Related to a T&D event)
6/19 – 0.02 days – Y
The unit tripped when the A-111 115kV line between the Ashland and Pemigewasset substations tripped. For this fault, PSNH uses a transfer trip function to trip the Ayers Island Station and the Alexandria biomass plant to prevent infeed current from the generators from causing relay misoperations and to prevent unintentional islanding (system protective devices operate in a manner that smaller isolated systems are created) within the area. The cause of the fault was a tree growing into the line. All relaying functioned as intended.

PSNH stated that this line had been side trimmed in 2004 and mowed in 2007. Additionally, the line was aerial patrolled for vegetation issues in August 2008. This was considered deferred work at this time. An aerial patrol was also done in early June 2009 by a contractor just prior to the incident. PSNH investigation into the incident found that the contractor noted the vegetation, but failed to pass on the information to PSNH. PSNH also stated that the section of line where the contact took place only had access through a wetland area and was planned and permitted to be mowed during frozen ground conditions during the winter of 2010.

PSNH investigation found that the subject section of the A-111 115kV line was not mowed in 2007 as it should have been. PSNH foresters are responsible for the integration and coordination of all vegetation maintenance requirements on a prescribed schedule for each line. PSNH has a coordinated vegetation management plan to ensure that the complete right-of-way for a line is completed on schedule. PSNH noted that since 2009, PSNH has been able to secure an annual blanket wetland permit making individual applications unnecessary. With this blanket permit and changes to wetland rules, PSNH states that beginning in 2010, there will be no deferred vegetation work. Also see Outage 2-B and Outage 3-C below.

D
9/14 – 30.17 days – Y
This scheduled outage was taken to replaced the TB-19 transformer breaker and disconnect switch. Substation brown glass insulators were also replaced.

PSNH also performed the scheduled annual inspection of the unit during this outage. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

Ayer's Island – 2

A
2/24 – 4.43 – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

B – (Related to a T&D event)
6/19 – 0.03 days – Y
The description of this outage is identical to that of Outage 1-C above.

C – (Related to a T&D event)
8/21 – 0.04 – Y
The unit tripped on overspeed when the 345 34.5kV breaker at Pemigewasset Substation tripped and reclosed due to a suspected lightning strike. The unit should not have tripped for this event. PSNH stated that the under voltage relays at the hydro plants across the system where found to be set approximately 33% higher than they should be making the units more susceptible to trips for remote faults. The Relays at Ayers Island were not reset until the fall of 2009. In addition to the PSNH outage, the lightning strike failed a Fair Point telecommunications circuit board interrupting SCADA communications to the station for four days until repairs could be made by Fair Point.

D
9/14 – 29.36 days – Y
The description of this outage is identical to that of Outage 1-D above.

Ayer's Island – 3

A
1/5 – 17.53 days – Y
The unit was taken off line due to collector ring brush arcing observed by the operator during his weekly rounds. Arcing with ample brush material generally indicates a moisture or surface issue. PSNH investigation found a rust deposit on the brushes indicating moisture.

PSNH installed additional ventilation louvers in a nearby entry door in 2008 to mitigate outages due to elevated bearing temperatures. PSNH suspects that moisture accumulated on the collector ring when the louvers were open during hot and humid days and when the unit was idle. The collector ring was removed, cleaned, and reinstalled, the brushes were replaced, and the unit returned to service. PSNH installed a new cover for the louver which would only be removed during the warmest days.

B
1/26 – 4.28 days – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

PSNH stated that the annual inspection was performed after only 4 months since the last inspection as there was no other time to do the work and to take advantage of the low flow conditions at this time.

C – (Related to a T&D event)
6/19 – 0.03 days – Y
The description of this outage is identical to that of Outage 1-C above.

D
9/14 – 29.33 days – Y
The description of this outage is identical to that of Outage 1-D above.

Canaan

PSNH received its new FERC license for the station in 2009. Included in the license were provisions to increase by-pass flows to 165 cfs, submissions of a host of studies and management plans, and negotiation with Vermont of the requirement in the Vermont Water Quality Certificate to require upstream passage of native non-anadromous brook trout. In terms of construction, 1,300 feet of wood stave penstock were replaced with a steel penstock.

Canaan – 1

A – (Related to a T&D event)
4/11 – 0.08 days – Y
The unit tripped due to a disturbance on the 355 34.5kV line. The targets at Canaan were overspeed and lockout (required on an overspeed trip). PSNH records showed that there were no dispatcher interruption reports or area work center trouble reports generated at this time indicating that no distribution protective devices operated. The event recorder at Lost Nation Substation did record a single phase voltage dip (less than .93 pu). The voltage dip, coupled with no trip of the line indicates a high impedance fault most likely caused by vegetation contact to the 355 34.5kV line. The 355 34.5kV line was both side trimmed and machine mowed in 2007. The unit returned to service when released by the dispatcher.

B
4/19 – 0.09 days – Y
The unit tripped off on overspeed relay action due to an unknown cause. PSNH investigation found that no distribution problems or substation problems occurred at this time. The overspeed relay targets were reset and the unit returned to service.

C – (Related to a T&D event)
4/23 – 0.18 days – Y
The unit tripped off on overspeed relay operation due to an unknown cause. PSNH records showed that there were no dispatcher interruption reports or area work center trouble reports generated at this time indicating that no distribution protective devices operated. The overspeed relay targets were reset and the unit returned to service.

D – (Related to a T&D event)
4/28 – 0.07 days – Y
The unit tripped due to operation of the time over current relays which tripped the Canaan 357 34.5kV breaker. A fault occurred on the 376 34.5kV line between Lost Nation and Whitefield. For this fault, the Whitefield end cleared first. The time over current settings for both the 357 breaker at Canaan and the Lost Nation breaker for the 376 34.5kV line are approximately the same because the 357 breaker at Canaan has to be able to operate for faults as far away as Lost Nation and the 376 line breaker has to be able to operate for faults as far away as Whitefield, however they do coordinate. PSNH investigation confirmed that the 357 breaker at Cannan should not have tripped for this event.

E – (Related to a T&D event)
5/14 – 0.06 days – Y
The unit tripped off on overspeed and time over current relay operations due to an unknown cause. PSNH records showed that there were no dispatcher interruption reports or area work center trouble reports generated at this time indicating that no distribution protective devices

operated. Windy conditions and vegetation contact are suspected as the cause for the outage. The relay targets were reset and the unit returned to service.

F – (Related to a T&D event)
7/3 – 0.19 days – Y
Lightning struck the 355 34.5kV line causing the 355 recloser at Colebrook to trip and reclose. PSNH found 2 blown bus pot fuses. The fuses were replaced and the unit returned to service. The unit is expected to trip for a fault on the 355 34.5kV line.

G – (Related to a T&D event)
7/16 – 0.07 days – Y
Lightning struck the 355 34.5kV line causing the 0355 breaker at Lost Nation to trip and reclose. The unit is expected to trip for a fault on the 355 34.5kV line.

H
7/17 – 0.08 days – Y

I
7/21 – 126.21 days – Y
This planned outage was taken to perform the in place replacement of 1,300 feet of wood stave penstock with a steel penstock and was planned for 144 days. The original schedule was to start the outage on 8/7/09, but PSNH was able to get a schedule change approved by ISO-NE. The early start eliminated winter working conditions. Also completed during this outage was the annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The work was completed and the unit returned to service.

J
11/23 – 0.03 days – Y
The unit was taken off line shortly after start up from Outage I above when the lube oil switch was intermittently indicating low oil flow. PSNH believes that the length of Outage was the cause. The switch was recalibrated and the unit returned to service.

K – (Related to a T&D event)
11/28 – 0.09 days – Y
The unit tripped off on overspeed and time over current relay operations due to an unknown cause. PSNH records indicated that there were no dispatcher interruption reports generated at this time, however, there were many area work center trouble reports. The relay targets were reset and the unit returned to service.

PSNH noted that there was no information from Lost Nation available as the event recorder at Lost Nation failed on 11/22/09 and was in the process of being repaired.

L – (Related to a T&D event)
12/9 – 0.84 days – Y
The unit tripped on overspeed relay operation due to what at the time was an unknown cause. PSNH investigation found that the 39X coil in the starting chain relay failed. The coil was replaced, but the unit could not return to service due to a subsequent pole accident occurring on the 355 34.5kV line. When the pole accident was repaired, the unit returned to service.

PSNH noted that there was no information from Lost Nation available as the event recorder at Lost Nation failed on 11/22/09 and was in the process of being repaired.

Eastman Falls

The major projects completed at this station for 2009 included completion of the dam resurfacing project and de-leading and painting of the waste gate as recommended by the FERC.

Eastman Falls-1

A
1/1 – 25.36 days – Y
This outage was the completion of the G-1 rewind project. Its evaluation was completed in the 2008 SCRC review. No further analysis is presented here.

B
3/8 – 0.05 days – Y
The unit tripped off due to a high spider bearing (main shaft bearing under the generator rotor) temperature occurring during a high building temperature event (outside air ambient was 39 degrees F). PSNH stated that their old policy was to set the spider bearing trip temperature just above normal operating temperatures. PSNH was in the process of reviewing the logic and coordination of all bearing alarm and trip points and settings. Eastman Falls-1 had its bearing temperature review completed in 2009 when new bearings were installed. PSNH had a condition of new bearings with old settings and had scheduled recalibration before summer operating conditions. This incident occurred before the temperature recalibration could take place. The operator increased ventilation and when the high temperature alarm cleared, the unit returned to service.

Bearing temperature settings were historically based on information received from the manufacturer and normal, alarm, and trip temperatures were based on the bearing operating temperature on the hottest day of operation. PSNH realized that the historic method of setting bearing temperature trip points was not ideal, requested maximum operating temperatures for the bearing from the manufactures, and increased bearing trip temperatures for the bearing. PSNH notes that even though the trip settings are at a higher temperature, the trip settings are below the maximum bearing operating temperatures. PSNH anticipates all temperature set points for all units will be completed in 2010.

C
3/9 – 0.06 days – Y
The unit again tripped on a high spider bearing temperature. The operator aligned the generator cooling duct to expel air directly outside and again increased ventilation into the building. When the high temperature alarm cleared, the unit was returned to service.

D – (Related to a T&D event)
4/3 – 0.10 days – Y
A fault occurred on the 337 34.5kV line fed radialy out of the Webster Substation causing the 337 breaker at Webster to trip and reclose. Eastman Falls is expected to trip for this fault. The line was patrolled and nothing was found. In conjunction with the investigation of the line fault, a cracked station insulator at Eastman Falls was found. Repairs were made and the unit returned to service. Also see Outage 2-A below.

E
5/21 – 0.07 days – Y
The unit tripped due to a high spider bearing temperature. The outside ambient temperature had risen to 92 degrees F. PSNH adjusted the spider bearing alarm temperature from 72 degrees F to 80 degrees F and increased the bearing trip temperature to 90 degrees F. The spider bearing was installed as part of the 2008/2009 generator rewind project. At that time relay settings were changed to those recommended by the manufacturer and they were different than the historical settings. After discussion with the manufacturer, PSNH changed the relay settings to coordinate with the temperature that the bearing can continuously operate at and not the ambient temperature. Please also see the discussion in Outage 1-C above.

Eastman Falls – 2

A – (Related to a T&D event)
4/3 – 0.11 days – Y
The description of this outage is identical to that of Outage 1-D above

B
4/20 – 0.04 days – Y
This was a scheduled outage to repair the anchor point for the fish directional louvers which had been damaged by underwater debris during spring flow conditions. The anchor point was repaired, the broken cable was spliced, the louver line was attached, and the unit returned to service.

C
7/20 – 15.07 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit and planned to last 13 days. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

The turbine Bestobell seal (this is the wet to dry turbine to generator shaft seal for a horizontal turbine that is lubricated by water) was disassembled and inspected to determine a cause for water intrusion into the lube oil system. No cause was found, but all internal seals were replaced. This emergent work extended the outage by 2 days. The unit returned to service. PSNH notes that the water intrusion stopped after this service was performed.

D
8/26 – 0.17 days – Y
The unit tripped when PSNH was troubleshooting a high temperature stator temperature indication on probe #7. The operator disabled the CH #7 trip circuit in the programmable logic controller which normally disables all the trips and alarms associated with the logic point. When the operator lifted CH #8 for a comparison check, the unit tripped on remote temperature device burnout.

PSNH stated that new controls were installed for this unit about 8 years ago and that testing procedures on the controls at Eastman Falls are different than at other stations. PSNH investigated the logic circuits causing this event, found them to be in working order, and the unit was returned to service.

PSNH notes that these control circuits are not worked on frequently and because of this incident, PSNH informed all electric control mechanics of the unique programmable logic control configuration at Eastman.

E
9/14 – 0.20 days – N
The unit tripped due to a high oil level in the hydraulic/lubrication unit that positions the turbine blades and lubricates the turbine bearings. The trip signal is sent when the reservoir level rises 3 inches. The operator found that approximately 20 gallons of oil had to be drained (out of approximately 250 gallons) in order to clear the alarm and restart the unit. Over the next two weeks, approximately 16 gallons of water was removed from the lube system indicating that river water had indeed seeped past the shaft seals.

PSNH realizes that using one reservoir for both hydraulic and lube oil functions is a problem and has been working on solutions to the Bestoball seal to prevent that water intrusion, but has had limited success. In 2010, PSNH stated that it is investigating the separation of the hydraulic system and the lube oil system for this unit as an alternative to raising the high oil level alarm setting which will introduce more risk for equipment damage.

Garvin's Falls

Major work at the station in 2009 included the replacement of the station boat barriers, building a new portage facility on the east side of the river, repairs to the G-1 head gate, and converting the station to run-of-river operations.

Garvin's Falls-1

A
3/15 – 1.25 days – N
This outage was scheduled to repair a leaking seal inside the servo piston (adjusts the blades in horizontal turbines). The seal was replaced and the unit returned to service.

B
3/19 – 0.01 days – Y
The unit was taken out of service when the operator noticed that temperature indication on the oil head servo (servo motor that actuates the shaft that pitches the turbine blades) was lost. PSNH investigation found a broken solid strand wire on the remote temperature device. In order to safely access the area, the unit was taken off line. The wire was repaired with a multi strand wire to make it less prone to cracking from vibration, and the unit returned to service. PSNH notes that a new wire has been pulled into position for installation during the 2010 annual inspection.

C
5/22 – 0.04 days – N
The unit tripped due to loss of oil to the generator bearing. Loss of oil was caused because the generator lube oil pump motor tripped. PSNH tested the lube oil pump motor and found it to be okay, but the overloads (acts like a breaker for motor protection) were replaced since the overloads may have been worn resulting in a premature trip of the motor. Repairs were completed and the unit returned to service.

D
6/29 – 32.22 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit and was planned for 34 days. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. All the head gate wheel bushings, seals, and rails for this unit were also replaced during this outage.

E
10/5 – 8.33 days – N
This was a scheduled outage to repair an oil leak in the nose cone bearing. These seals and O-rings are replaced approximately every 3 to 5 years or when work is being performed on the

nose cone and were replaced during the annual inspection in Outage-D above (Approximately 3 months earlier). PSNH investigation found the seals damaged. The seals and O-rings were replaced and the unit returned to service. PSNH O-ring replacement is covered by a procedure that includes the use of a jig, glue curing time, but the installation is blind. Once the O-ring is installed, it can not be seen or inspected after installation. PSNH does not believe that this is a material issue.

The O-rings are 19” (in diameter) and are not a stock size. The O-rings must be handmade using a splice kit. The ends are glued together with a super-glue type of material. PSNH has contacted the manufacturer with regard to this issue but the company has been bought out and the new owner gives little attention to this issue. PSNH is also active in discussing this issue with other owners of similar units.

F
10/22 – 0.02 days – Y
This planned outage was taken to perform the ISO-NE annual required Black Start test for the unit. The test was completed and the unit returned to service.

G
12/15 – 0.04 – Y
This outage was scheduled to remove the fish louver line for the winter months. PSNH found that the lower section had separated from the upper section and a large amount of debris was trapped in the louver line. PSNH deferred this repair until warmer weather, but prior to the 2010 fish passage season.

Garvin’s Falls – 2

A
3/9 – 0.04 days – Y
The unit failed to phase on line when requested to do so by the E-SCC dispatcher. PSNH investigation found targets on the excessive VAR relay. The unit was checked and nothing was found wrong. The relay targets were reset and the unit started without incident. Please see also Outage-B, Outage-D, Outage-H, and Outage-I below.

B
3/17 – 0.03 days – Y
The unit tripped off line due to excessive VARs. PSNH investigation which included testing the excess VAR relay found nothing out of order, but noted that the relay setting had drifted (changed) but was still within tolerance. The relay setting was increased 10 percent in an effort to stop the unit trips while a longer term solution was sought. The unit was returned to service.

C
3/24 – 0.04 days – Y
The unit tripped due to loss of AC power that powers the excess VAR relay. PSNH found that the AC breaker in this circuit failed. The breaker was replaced and the unit returned to service. Accion notes that this outage is independent of the other outages of this unit regarding excessive VARs.

D
4/30 – 0.08 days – Y
The unit tripped again due to excessive VARs. PSNH found that the relay setting had drifted from its set point and suspected the relay to be bad. There was no spare relay to install. The relay was adjusted and the unit returned to service. PSNH ordered 2 new relays on 5/1 which were received in early August. One of the new relays was installed during Outage-I below.

E
6/29 – 0.26 days – Y
The unit was taken off line for safety considerations while divers installed tailrace panels in Unit-1.

F
6/30 – 0.02 days – Y
The unit was taken off line for safety considerations while divers installed tailrace panels in Unit-1.

G
7/1 – 0.01 days – Y
The unit was taken off line for safety considerations while divers installed tailrace panels in Unit-1.

H
7/27 – 0.06 days – Y
The unit again tripped due to excessive VARs. The excess VAR relay continued to drift out of calibration. New relays had not yet been received, so the relay was recalibrated and the unit was returned to service.

I
8/24 – 0.04 days – Y
The unit again tripped due to excessive VARs. The new relay was received in early August. The relay was replaced and the unit returned to service. PSNH notes that the incidents have ceased.

J
10/13 – 7.29 days – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. Work was performed on a straight time basis as there was insufficient water to run the unit.

K
10/22 – 0.02 days – Y
The description of this outage is identical to that of Outage 1-F above.

L
12/15 – 0.04 days – Y
The description of this outage is identical to that of Outage 1-G above.

Garvin's Falls – 3

A
10/22 – 0.02 days – Y
The description of this outage is identical to that of Outage 1-F above.

B
12/15 – 0.03 days – Y
The description of this outage is identical to that of Outage 1-G above.

Garvin's – 4

A
4/25 – 0.09 days – Y
The unit tripped and locked out without any target indication except lock out because the target indicator coil failed. The weather was quite warm and the operator thought that high bearing temperature might have initiated the trip. The operator checked unit temperatures, opened the station vents, and restarted the unit. Please see Outage-B below.

B
4/25 – 0.07 days – Y
The unit again tripped and locked out without relay target indication. Due to the fact that this was the second trip that day (Saturday), PSNH called in the Electrical and Control working foreman. When the working foreman arrived, he noticed that the thrust bearing temperature appeared high for the amount of time the unit had been off line. Further investigation found that the coil for the bearing temperature drop on the annunciator panel (targets) had failed. The coil failure accounted for no target indication for the two unit trips. The coil was replaced, additional ventilation was provided, and the unit returned to service.

C
7/18 – 0.24 days – Y
The unit tripped when the 39 relay coil failed in service. The 39 relay coil is part of the permissive start chain and is a series component. The circuitry of the start chain is also required for continued operation as designed for this unit. The coil was replaced and the unit was returned to service.

D
9/8 – 3.24 days – N
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

E
10/22 – 0.02 days – Y
The description of this outage is identical to that of Outage 1-F above.

F
12/15 – 0.04 days - Y
The description of this outage is identical to that of Outage 1-G above.

Gorham

Major projects at Gorham in 2009 included the replacement of the G-1 draft tube, replacement of the canal retaining wall, and replacement of the five canal head gates.

Gorham – 1

A
5/26 – 0.61 days – Y
The E-SCC dispatcher received a low by-pass flow (minimum flow requirement) alarm and took Unit-1 and Unit-2 off line. When the operator arrived, he found that the pond level was low, but the 200 cfs flow requirement around the units was being met. The operator set the pond level control higher to assure water passage over the dam. The units were started later in the day when the pond reached the new control level.

B
10/13 – 34.16 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit and was planned for 13 days. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. The replacement of the G-1 draft

tube, the 5 canal head gates, and the canal retaining wall were also completed during this outage. Inspection of the bearings found significant casting damage which extended the outage.

Gorham – 2

A – (Related to a T&D event)
2/8 – 0.03 - Y
Lost Nation Substation has two 115/34.5kV transformers installed. One of the units is out of service. PSNH did not need to replace the failed transformer due to the reduction of load associated with the closing of paper mills. The transformer was isolated from the system. The high side motor operated disconnect switch on the unit in service failed causing the D-142 115kV line between the Lost Nation and Whitefield substations to trip. The initial operation was correct, however, the S-136 breaker on the other 115kV line into Berlin over tripped for this fault. PSNH investigation found that the loss of paper mill load in the area had created infeed and other protection issues in the area resulting in the over trip. PSNH was aware of this condition in 2005 and initiated projects in 2006, 2007, 2008, and 2009 (to take place later in the year) to correct the situation. New settings were issued and implemented as a short term solution. In addition, new and more sophisticated relaying was installed in October 2009 to correct the protection issue as planned. The unit returned to service when released by the dispatcher. Also see Outage 3-A and Outage 4-A directly below and Smith Outage 1-B below.

B
5/8 – 4.23 days – Y
The unit was taken off line by the operator when he noticed arcing on the upper collector ring and brushes. Investigation found that the collector ring was scorched and pitted caused by a breakdown of a collector ring insulator. The collector ring assembly was disassembled, refurbished, and reinstalled. The unit was returned to service without incident.

C
5/26 – 0.45 days – Y
The description of this outage is identical to that of Outage 1-A above.

D
6/2 – 2.33 days – Y
The unit tripped due to the failure of the 65S2 governor coil. The coil failure caused an unfused potential transformer to overload which in turn resulted in a small fire within the potential transformer enclosure. An operator who happened to be at the station extinguished the fire. The relay coil and enclosure wiring were replaced and the unfused potential transformer was replaced with a fused potential transformer. The unit was returned to service without incident.

The potential transformer cabinet is too small to install fuses on the primary side of the transformers so as an interim measure, PSNH installed fuses on the secondary side of the transformers for both Unit-1 and Unit-2. Unit-3 and Unit-4 do not use potential transformers in this manner so this is not an issue with those units. PSNH will be installing larger potential transformer enclosures in 2010 and installed fused potential transformers. As a result of this issue, PSNH identified other stations that have a similar potential transformer configuration issues and is looking into an alternative design.

E
6/23 – 1.00 day – N
The unit was taken off line when the operator noticed that the flyball governor motor was warmer than usual on his rounds. Investigation revealed that the motor was okay. Two potential transformers feed power to the flyball governor to supply feedback to the governor (Generator speed varies with potential transformer voltage), but that the newly installed potential transformer (Outage-D above) was configured differently than the other transformer. In the installation of the new PT, polarity could not be determined without asbestos abatement taking place and there was no diagram indicating the correct polarity connections. The transformer connections were properly reconfigured and the unit was returned to service.

F
10/13 – 34.16 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. Due to the fact that Unit-2 shares the same wheel pit with Unit-1 (out of service for draft tube replacement), PSNH accomplished many other maintenance items during this outage including measurement of the wicker gate openings and inspection of the runner.

Gorham – 3

A – (Related to a T&D event)
2/8 – 0.03 days – Y
The description of this outage is identical to that of Outage 2-A above.

B
4/9 - 0.04 days – Y
The unit tripped due to loss of field. PSNH found that the field contactor dropped out. No apparent reason was found upon investigation. The unit was restarted without incident. PSNH noted that they placed a recording meter to monitor the unit for 3 weeks. No activity took place during the three week period and there have been no further incidents.

C
6/2 – 0.01 days – Y
The unit tripped off at the same time as the Unit-2 potential transformer fire (Outage 2-D above). PSNH states that Unit-2 and Unit-3 share no exciter circuitry so that it is unknown why

the unit tripped at that time. The unit was checked, nothing was found, and the unit returned to service.

PSNH has yet to find the circuitry link between Unit-2 and Unit-3 or the reason for the unit trip.

D
6/8 – 8.22 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. PSNH accomplished many other maintenance items during this outage including inspection of the runner and replacement of the turbine bearing.

E
9/15 – 0.07 days – N
The unit tripped due to no oil pressure on the actuator cylinder. PSNH investigation found a factory installed broken wire on the actuator controller. The motor starter for the actuator pump was replaced thus also replacing the broken wire and the unit returned to service.

F
10/14 – 0.01 days – N
The unit was taken off line by the E-SCC dispatcher when a low by-pass flow alarm was received. PSNH states that a control mechanic called the E-SCC 15 minutes before the incident to inform them that false by-pass flow alarms might be received as work was being performed to install a new pond level sensor. Before the message was passed to the hydro desk at the E-SCC, the incident occurred.

The operator at the station immediately called the E-SCC to start the unit, but the unit failed to phase when started. PSNH found a bad auxiliary coil which is supposed to pick up the gate lock mechanism. It is believed that coil failure occurred on the request to the restart the unit. Another unit was started in its place. The coil was replaced and the unit returned to service.

G
10/20 – 0.27 days – Y
The unit was taken off line to float the new draft tube being installed in Unit-1 across the tailrace area. When the draft tube cleared the tailrace area, the unit returned to service.

H
10/21 – 0.22 days – Y
During the annual thermographic inspection of the station, a hot spot was detected on disconnect switch DX5303. Unit-3 and Unit-4 were taken off line to clean and exercise the

disconnect switch. Once the work was completed, the unit returned to service. Please also see Outage 4-G below.

I
10/24 – 0.03days – Y
The E-SCC followed procedure when a low by-pass flow alarm was received. Upon arriving at the station, the operator found that one flash board was down as required to meet minimum flow requirements. Under the conditions found, the low by-pass flow alarm triggered because of false indication from the by-pass flow transducer, but upon field investigation, PSNH determined that the required minimum flow was more than satisfied. PSNH also adjusted the pond level indicator higher and the unit returned to service. Please also see also Outage 4-H below that occurred later in the day.

J – (Related to a T&D event)
10/31 – 0.02 days – Y
A tree contact to the 352 34.5kV line between Gorham and Whitefield substations caused the Gorham 0352 breaker to trip and reclose. The unit tripped on under voltage and over current relay operation. The unit should not have tripped for this fault. PSNH stated that the under voltage relays at the hydro plants across the system where found to be set approximately 33% higher than they should be making the units more susceptible to trips for remote faults. The Relays at Gorham were immediately reset after this incident. The unit was returned to service when released by the dispatcher. Also see Outage 4-I below.

Gorham – 4

A – (Related to a T&D event)
2/8 – 0.04 days – Y
The description of this outage is identical to that of Outage 2-A above.

B
5/14 – 0.00 days – Y
The unit tripped off line during calibration of the wicker gate actual position to that of the control computer indication. The mechanic closed the gate too close to the 0/10 (full closed) position and the unit tripped. This adjustment is a coarse adjustment and the operator made an error by getting too close to the 0/10 gate position (within 3%). The unit was checked over and returned to service and the mechanic completed the calibration at higher gate openings. To prevent similar occurrences, PSNH has prepared a list of all the minimum gate positions for use at all its hydro stations during calibration.

C

6/29 – 0.03 days – Y

The unit tripped due to low actuator oil pressure. PSNH investigation found that the actuator (Supplies energy to perform a calculated value) pump had a bad contactor. The contactor was replaced and the unit returned to service.

D

8/31 – 3.24 days – N

This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. PSNH accomplished many other maintenance items during this outage including inspection of the runner and servicing the actuator.

E

10/5 – 0.03 days – Y

The unit was taken off line by the E-SCC dispatcher when a low by-pass flow alarm was received. While refurbishing the retaining wall, the buried milliamp transducer cable (in conduit) for the level sensor system was damaged by the contractor causing the low flow alarm. A temporary repair was made to the cable and the unit returned to service.

PSNH investigation found out that it had marked the cable for the contractor as required by Dig Safe Regulations, but the contractor failed to maintain his markings during the course of the work. In addition, the cable was buried only 10 inches deep. PSNH stated that it has spoken to the contractor who has a long standing good record with PSNH and chose not to pursue the matter further because of the minor damage and the fact that the unit quickly returned to service. This matter has been referred to the NHPUC Safety Division.

F

10/20 – 0.25 days – Y

The description of this outage is identical to that of Outage 3-G above.

G

10/21 – 0.22 days – Y

The description of this outage is identical to that of Outage 3-H above.

H

10/24 – 0.06 days – Y

The unit was taken off line by the E-SCC dispatcher when a low by-pass flow alarm was received. When the operator arrived, he found the pond level up and that adequate by-pass flow was occurring as one flash board was down. The unit was returned to service. Further investigation found that the by-pass flow level transducer was giving a false reading. The faulty transducer and its surge protector were both replaced. PSNH also notes that an improved style transducer was installed on 11/16/09.

PSNH notes that since the new transducer was installed, there have not been any similar outages.

I – (Related to a T&D event)
10/31 – 0.03 days – Y
The description of this outage is identical to that of Outage 3-J above.

Hooksett

The major projects completed at Hooksett in 2009 included the replacement of the boat barriers, replacement of unreliable brown glass station insulators, and installation of animal guards throughout the substation.

Hooksett – 1

A
8/17 – 4.27 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. PSNH accomplished many other maintenance items during this outage including inspection of the runner and a complete inspection of all generator related components.

PSNH considered consolidation this annual inspection with the extensive switch yard work scheduled for October 2009. In the annual inspection, station service is necessary to provide pumps, tools, lights, ventilation, and testing power. The October outage required complete power isolation. PSNH decided for worker safety reasons to not perform the work concurrently. PSNH also noted that an additional two days would be required to consolidate the outages to assure safe conditions during hook-up and detachment from a temporary service.

B
8/31 – 0.02 days – Y
The unit was removed from service to repair a leaking sight glass on the governor causing oil to puddle on the floor. The sight glass gaskets were replaced and the unit returned to service.

C
10/19 – 11.31 days – Y
This was a scheduled outage to replace all the station brown glass insulators, add animal protection, and remove obsolete equipment. The work was completed on schedule.

Jackman

The major projects completed for this station in 2009 included repair of the spillway lip, and the installation of the new TB-9 step-up transformer.

Jackman-1

A – (Related to a T&D event)
3/27 – 0.01 days – N
This was a scheduled outage taken to verify wiring and contact arrangement for the design of the protection circuits for the installation of the new TB-9 transformer.

B – (Related to a T&D event)
4/6 – 0.03 days – N
The unit tripped when a fault occurred on the 311X1 34.5kV circuit and caused the 311X1 recloser to operate. The unit should not trip for this fault; however, it tripped on overspeed relay operation. The 311X1 circuit was patrolled and nothing was found that explained the fault. The patrol did find vegetation that should be trimmed and forwarded that information to vegetation management. The unit returned to service when released by the dispatcher.

C – (Related to a T&D event)
12/1 – 9.29 days – N
PSNH took this planned outage to install the new TB-9 step-up transformer which would be the replaced for the unit that failed in 2008. PSNH also performed the annual inspection of the unit during this outage. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected.

All costs related to the incident were covered by the contractor’s insurance. Insurance did not cover the replacement of one 34.5kV breaker and the change out of two relay systems as these items are considered upgrades. The breakdown of the insurance payments appears below.

Total Transformer Replacement Cost - $1,100,000
Replacement Power Cost 2008 - $59,980
Replacement Power Cost 2009 - $ 103,615
Insurance - $900,000

The breakdown of the $900,000 insurance proceeds was $163,595 for replacement power costs and $736,405 offset to the transformer replacement. The remaining $363,595 was for the specific upgrades to the station.

Smith

Major projects at this station in 2009 included the replacement of the station battery and the painting of the steel access bridges to the dam.

Smith-1

A
9/12 – 5.24 days – Y
This planned outage was taken to perform the scheduled annual inspection of the unit. A visual inspection, general cleaning, and equipment tests were performed. Both the turbine and generator were inspected. PSNH accomplished many other maintenance items during this outage including inspection of the runner and replacement of the high side bushings on the step-up transformer.

B – (Related to a T&D event)
10/17 – 0.29 days – Y
This scheduled outage was taken to perform protection testing requirements for Smith hydro in conjunction with the protection upgrades required at the Berlin Substation to correct the S-136 115kV line over trip coordination problem (Also see Outages Gorham 2-A, Gorham 3-A, and Gorham 4-A above). The work was coordinated with PSNH hydro personnel, distribution personnel, and required an 18 week ISO-NE lead time. The work was completed and the unit returned to service.

Evaluation for Hydro Units Except for Outage Amoskeag 2-C, Outage Eastman 1-A, Outage Jackman 1-A, Outage Jackman 1-C, Outage Ayers Island 1-B, Outage Ayers Island 2-C, and Outage Ayers Island 3-B, and Outage Gorham 3-F.
Accion reviewed these outages and found them either to be reasonable and not unexpected for these units and their vintage or necessary for proper operation of the units. Accion concluded that PSNH conducted proper management oversight.

Outage Amoskeag 2-C
It has been convention to analyze an over lapping outage in the year where the majority of the outage occurs. Where the majority of the outage occurs in 2010, it will be analyzed during the 2010 SCRC review.

Outage Eastman 1-A
This outage was the completion of the G-1 rewind project. Its evaluation was completed in the 2008 SCRC review. No further analysis is presented here.

Outage Jackman 1-A and 1-C

Outage 1-A was required to verify protection circuitry for the replacement of the TB-9 step-up transformer. Outage 1-C was the outage required to actually replace TB-9.

Both of these outages would not have been required but for the failure of TB-9 in 2008 due to contractor action where the NHPUC declined to allow PSNH to recover costs. Accion recommends that replacement power costs related to these outages also not be recovered. Accion further recommends that where the annual inspection was performed during Outage 1-C and that the annual inspection outage would have been taken regardless of the TB-9 transformer replacement, that normal inspection outage time (Approximately 4 days) be deducted from the length of Outage-C in determination of the replacement power costs.

Outage Ayers Island 1B, 2-C, and 3-B

This outage took place due to multiple breakdowns of PSNH's vegetation management process when dealing with line sections that deal with wetland areas. This area became deferred work in 2007, was not performed in 2008, assumed to be deferred work in the 2008 patrol, and not reported to PSNH in the 2009 patrol just prior to the incident. PSNH foresters are responsible for the integration and coordination of all vegetation maintenance requirements on a prescribed schedule for each line. PSNH has a coordinated vegetation management plan to ensure that the complete right-of-way for a line is completed on schedule. Such oversight was not exercised here. Accion recommends that replacement power costs associated with these outages not be recovered from customers.

Outage Gorham 3-F

The hydro operator called the E-SCC at least 15 minutes prior to the start of work and informed them that false by-pass flow indications might be received. The E-SCC did not pass this information on in a timely manner and as a result, incorrect action was taken by the dispatcher. Accion believes that insufficient dispatcher attention was given to this situation and that replacement power costs should not be recovered from customers.

Combustion Turbine Outages For 2009

The following outages took place at PSNH's combustion turbine units during 2009:

Lost Nation CT-1

Major work that was completed at Lost Nation during 2009 that included the installation of the ISO-NE RIG (Remote Interface Gateway[1]) control of the unit at the E-SCC.

Lost Nation – 1

A
4/13 – 4.10 days
This scheduled outage was taken to perform the annual inspection. Included in the work performed were a visual inspection, general cleaning, annual equipment tests and servicing the diesel starter engine. Testing and inspections revealed no abnormalities. The ISO-NE RIG was also installed at the E-SCC and the ISO-NE black start test was completed.

White Lake CT-1

Major work that was completed at Lost Nation during 2009 included the installation of the ISO-NE RIG control of the unit at the E-SCC.

White Lake – 1

A
1/26 – 0.07 days
The E-SCC dispatcher received a loss of flame alarm indicating that the unit failed to start when the unit was requested to meet its winter audit. Investigation could not determine a cause for this alarm. The unit was restarted without incident and completed its winter audit.

PSNH noted that after further investigation, adjustments were made to the inlet temperature sensing element which controls the logic for flame indication and the event has not been repeated.

[1] This remote access system allows ISO-NE direct access to PSNH's 3 fossil stations plus the combustion turbines at those stations, access to the Lost Nation and White Lake combustion turbine, plus the hydro stations through the E-SCC.

B

2/1 – 0.10 days

The unit was off line when the E-SCC dispatcher received a general and a unit “no go” alarm. PSNH found generator stator high temperature, fuel valve lockout, and loss of 125V DC targets at the station. Remote temperature devices were tested and their wiring connections were checked for tightness. Nothing was found wrong. The alarms were cleared and the unit was returned to service.

C

4/6 – 4.34 days

This scheduled outage was taken to perform the annual inspection. Included in the work performed were a visual inspection, general cleaning, and annual equipment tests and servicing the diesel starter engine. Testing and inspections revealed no abnormalities. The browser filters (fuel filters between the fuel tanks and the engine) were replaced, the ISO-NE RIG was installed at the E-SCC, and the ISO-NE black start test was completed during this outage.

D

7/1 – 0.03 days

The unit was off line at the time when the unit was removed from service to repair a loose oil pipe on the gear box that was causing an oil leak. The oil leak was detected during routine operator inspections conducted on 6/30. The pipe was tightened, necessary cleanup performed, and the unit was returned to service.

E

8/11 – 0.08 days

The unit failed to phase when requested to do so by the E-SCC for the summer audit. PSNH investigation found that there was no indication of line-side bus voltage for metering and instrumentation. PSNH found corrosion at the PT-11 fuse connections. The fuse connections are pulled (a requirement for isolation) and inspected during the annual inspection. The fuses were removed, cleaned, tested, reinstalled and power was restored to the control circuits. The unit started and the summer audit was completed.

PSNH suspected that the abnormal dampness occurring in 2009 may have been the cause. PSNH notes that a new and better heater was installed in 2010 and the problem has not reoccurred.

Schiller CT-1

A

3/9 – 3.6 days

This scheduled outage was taken to perform the annual inspection. Included in the work performed were a visual inspection, general cleaning, and annual equipment tests. Testing and inspections revealed no abnormalities.

B

9/12 – 0.4 days

This planned outage was taken to reconfigure the unit to the 34.5kV system to accommodate the replacement of 13.8kV switchgear at Schiller Station.

C

9/21 – 0.2 days

This planned outage was taken to reconfigure the unit back to the 115kV (its normal configuration) system after the replacement of 13.8kV switchgear at Schiller Station.

D

10/14 – 15.2 days

PSNH had just completed operation of the unit. An oil leak was reported at the exciter end of the generator. PSNH opened up the area between the generator and exciter and found that the the bearing between the generator and the exciter had been damaged. The bearing was removed and sent out for repair.

Once the bearing returned in a repaired state, PSNH could not install the bearing as the physical size of the repaired bearing is larger than the damaged bearing PSNH then determined that the generator physical location had shifted towards the exciter. PSNH opened the other end of the generator and found that bearing was also damaged. That bearing was also sent out for repair. PSNH believes that the generator shift caused the bearing damage. No alarms were received from either bearing during operation. As part of its investigation, PSNH checked the bearing alarms of both bearings and they were found to be in good working order.

In order to install the two repaired bearings, PSNH was required to do a complete alignment of the entire combustion turbine unit. PSNH states that the last time it was required to take the unit apart was approximately 10 to 15 years ago, that no vibration or other abnormal indications were noted during operation, and that the unit had seen little operation over the 10-year period.

Merrimack CT-1

CT-1 and CT-2 are connected to the 115 kV transmission yard via a common step-up transformer (MT-3) and have common fuel systems. Some of the concurrent outages listed below are a result of that configuration.

A
4/27 – 3.5 days
This scheduled outage was taken to perform the annual inspection. Included in the work performed were a visual inspection, general cleaning, and annual equipment tests. Testing and inspections revealed no abnormalities. Although not required to because of configuration, the CT-2 annual outage was performed at the same time in order to complete an inspection of the common MT-3 step-up transformer. (Also see Outage 2-A below)

B
10/1 – 0.0 days
While on scheduled rounds, an operator found that there was a zero voltage unbalance between the phases. A blown fuse was found on the on the CT-1 PT. The fuse was replaced and the unit was returned to service.

Accion notes that there have been other fuse events at this location and events related to lightning strikes.

Merrimack CT-2

A
4/27 – 3.5 days
This scheduled outage was taken to perform the annual inspection in conjunction with unit CT-1. Included in the work performed were a visual inspection, general cleaning, and annual equipment tests. Testing and inspections revealed no abnormalities. Please also see Outage 1-A above.

B
7/27 – 1.1 days
The unit was requested to start by the E-SCC. The unit would not phase automatically. The unit was started manually, but PSNH noted that the unit had poor voltage control. PSNH called in Eaton Electric who responded the next day. The voltage regulator was tested and monitored in the manual position. Eaton Electric found an undervoltage relay hung up. Eaton Electric repaired the relay and tested the voltage regulator in the automatic mode and it ran properly. The unit was returned to service.

C

10/5 – 0.5 days

The unit was called upon to run by the ISO. The unit failed to automatically phase to the system. The unit was successfully started on manual operation. PSNH noticed that the unit voltage was swinging. The undervoltage relay was checked (because it was suspect from Outage B above) and found to be okay. PSNH exercised the voltage regulator. No abnormalities were found.

PSNH notes that the voltage regulator is to be replaced in 2010 as it is original equipment and is no longer supported by the manufacturer.

D

10/19 – 0.1 days

Both combustion turbines were called to operate by ISO-NE. CT-2 did not start on command. PSNH investigation found that the control air valve was in the closed position when it should have been in the open position. This valve position irregularity explained the unit's failure to start.

PSNH notes that the unit responded as requested on 10/13/2009 without incident and that air conditioning work was performed on the air system prior to this event and after 10/13/2009. The isolation process for the air conditioning work did not involve this valve and did not involve tagging of any equipment. After the incident, PSNH questioned the personnel that performed the air system work, the Instrument and Control group, and the operations group. No other work was performed on the unit.

PSNH also noted that the computer at Merrimack Station used to track tag out operations was changed on February 10, 2010 and no tag out history was retained. The normal retention time for used tags is two weeks unless a safety incident occurs. Some of the above information came from personal archives.

Evaluation for Combustion Turbine Outages Except for Outage Merrimack CT 2-D

Accion 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 concluded that PSNH conducted proper management oversight during these outages.

Evaluation for Merrimack CT 2-D

Operator error may have been the initiating cause for the event. However, PSNH was not able to determine a cause for the incident. As a result, the event cannot be reconstructed or have the root cause determined with a high degree of certainty. Although some events are saved for evaluation, there appears to be instances where events may not be able to be reconstructed after the fact. While Accion recommends that PSNH should be allowed to recover the replacement power costs associated with this outage from its customers, it offers a recommendation in this regard below.

Recommendations

Related to Outage Merrimack CT 1-B

Accion recommends that fuse coordination, protection device placement, and lightning protection at this and surrounding locations be checked to ensure that optimum equipment protection is in place allowing the most reliable operation of these units.

Related to Outage Merrimack CT 2-D

Accion recommends that PSNH establish a process or procedure that expands its process for safety related incidents. PSNH should also save its used tags or other pertinent information when any abnormal switching, valving, or operation event takes place for internal investigative purposes. This recommendation applies to all PSNH generation facilities.

W. F. Wyman-4 Outages For 2009

W. F. Wyman-4 Station

The W. F. Wyman Station was sold in the 1990s to a competitive power supplier and competes in the New England competitive market to sell its power. PSNH is a minority owner (Approximately 3 percent) of Unit #4 at the station. Nextera Energy Resources (Nextera) owns the majority of the unit and is responsible for day-to-day operations. As a minority owner, PSNH is aware of how the plant conducts business. However, PSNH has little influence over day-to-day operations of the plant provided those operations are within wide operating bounds. This unit is a high cost oil unit that has tight environmental operating restrictions placed on it. The unit operates at an annual capacity factor of approximately 5 percent. Accion makes this distinction because it believes that the measurement of prudence is different than the measurement used for PSNH's wholly-owned and controlled units providing energy at cost to PSNH customers because of the extent of outside ownership.

The major project performed at Wyman-4 this year was the replacement of the economizer inlet header during the annual overhaul described in Outage J below.

W. F. Wyman-4

A
1/22 – 0.3 days
The fabric expansion joint at the induced draft fan was leaking and causing exhaust fumes to infiltrate the plant. The unit was taken out of service to repair the leak. The expansion joint was replaced and the unit returned to service.

B
1/24 – 0.1 days
The operator transferred to the automatic load demand control during startup with a throttle pressure that was greater than allowed, causing the swap to fail. The generator load target defaulted to zero and the unit tripped on reverse power relay operation. This outage was classified as an operator error. Nextera's investigation found that the reason that the load demand control did not function properly was that the operator attempted to place the boiler master control into automatic mode before placing the fuel oil controller into automatic mode first as required by procedure. Without both controls in automatic, the load demand control cannot switch to automatic control.

The operator was counseled. In addition and after the incident, Nextera made modifications to the controls and start up procedure and added insulation in areas where the addition of insulation could reduce the unit's long start-up time.

C
1/30 – 0.0 days
The boiler tripped on low air flow while at a low unit loading. The operator placed the 4th burner pair into service and a furnace pressure swing caused the unit to trip when air flow decreased below the trip point. Nextera determined that there was a control logic issue with draft fan air flow when the unit was at low load. As an interim measure, the air flow controller was kept in the manual mode until after the fourth burner pair was placed in service. The unit returned to service without incident. Accion notes that the control logic was changed to address this problem on 2/27/09.

D
2/6 – 0.1 days
The unit tripped on low drum pressure when the boiler feed pump tripped due to low suction pressure. While transferring the condensate polisher to a standby vessel, the outlet valve was left closed by the operator when it should have been opened. As a result, the deaerator level decreased to a point where the boiler feed pump starved initiating the incident. Nextera stated that the control room operator did not see the low deaerator alarm. This outage was classified as an operator error.

Nextera counseled both operators. In addition, a flow meter was installed at the condensate polisher so the control room operator can monitor polisher outflow rate and improved valve position marking was installed at the outlet valve.

E
2/24 – 0.0 days
The boiler tripped on an unsuccessful burner shutdown event. When a burner pair gang valve was closed to remove the burners from service, a limit switch failed to activate to satisfy the burner management controller logic that the oil valve to the burners was closed. Investigation found that the limit switch was in the need of cleaning. The switch was cleaned and tested. As a precaution, 30 other limit switches were tested and found to be operable. The unit returned to service without incident.

F
6/5 – 0.3 days
A planned maintenance outage was taken to perform replacement of the bus duct heaters. Nextera decided to replace the bus duct heaters because of issues that occurred in 2008 and were reviewed as part of the 2008 reconciliation docket.

G

6/30 – 0.4 days

A planned maintenance outage was taken to perform replacement of the bus duct heaters. Nextera decided to replace the bus duct heaters because of issues that occurred in 2008 and were reviewed as part of the 2008 reconciliation docket.

H

8/10 – 0.1 days

The unit tripped due to low drum pressure caused by a trip of the boiler feed pump. As the unit was loaded, the condensate pump discharge pump failed in the open position causing the deaerator level to drop and subsequently tripping the boiler feed pump. Investigation found that the valve motor actuator bushing key failed thus decoupling the valve from its actuator. The actuator bushing key failed because it fell out of position because the original design never had a key retaining device. The valve was repaired with the addition of a key retaining device and the unit returned to service. Nextera also added key retaining devices to all like valves.

I

8/11 – 0.1 days

The control room operator attempted repeat starts on a burner pair which induced a furnace pressure swing that tripped the boiler on low furnace pressure. This outage was classified as an operator error. Investigation found that the operator did not follow procedure by attempting repeat starts of the burner pair. Apparently, each start attempt pulses other items such as air flow dampers etc. which caused the boiler pressure excursion. The unit was restarted without incident. Subsequent to this outage, Nextera introduced a 30 second delay into the burner start up logic which prevents repeated start attempts and corresponding compound pulses to other equipment.

J

11/6 – 30.1 days

This planned outage was taken to perform the annual overhaul of the unit. In addition to regularly scheduled maintenance, the economizer inlet header was replaced. The economizer work controlled the outage and the outage was completed within the ISO-NE scheduled outage window.

K

12/21 – 0.0 days

The boiler tripped on low combustion air flow tripping the unit. Investigation found that the thermal couple which supplied the temperature value to the combustion air flow calculation had an internal lead failure in its sensing element. The internal lead failure resulted in a 1300^{o} F temperature (much higher than actual) feeding into the calculation resulting in a reduction in air flow and incomplete combustion. The thermocouple and sensor were replaced and the unit returned to service. Subsequent to the outage, high/low limits were added to the digital control system for this point and other similar points.

Evaluation Except for Outages Wyman 4-B, 4-D, and 4-I

Accion reviewed the outages above 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.

Evaluation of Outages Wyman 4-B, 4-D, and 4-I

Nextera classified each of these outages as operator error. Although operator error was the direct cause, Accion finds that operator attention, operator awareness, operator understanding of procedures, and operator lack of understanding that procedures must be followed are the causes of these outages. All of these issues relate to training inadequacy of the operators involved. Accion recommends that the replacement power costs associated with these outages not be passed on to customers.

Stipulation Items from the 2008 Energy Service/Stranded Cost Recovery Review (Docket DE 09-091)

During the 2008 Energy Service/Stranded Cost Recovery Review conducted in 2009 in Docket DE 09-091, Public Service of New Hampshire (PSNH) and the parties stipulated to a number of items to resolve outstanding issues in the case (Stipulation). The formal Stipulation was signed on November 20, 2009. The actions taken by PSNH on each stipulated items and Accion comments follow.

1 - Mitigation of Customer Costs

From Section II-A of the Stipulation, PSNH was to provide its efforts to mitigate customer costs related to certain 2008 generating unit outages: Outage MK-2 E, Outage NEW 1-C, and Outage NEW 1-D.

Outage MK-2E

When the new HP/IP turbine experienced problems due to foreign material intrusion, it essentially became “used equipment”. Siemens would normally reduce any warrantees for used equipment and could then claim that the performance guarantees given for the “new” HP/IP turbine were no longer valid.

Rather than pursue a host of smaller settlements with Siemens on multiple contracts, PSNH decided that it would have more leverage in negotiations if it were to pursue a global settlement. To that end, a global settlement was reached with Siemens that produced the following credits to customers. PSNH:

- Reduced the MK-2 exciter rental payments from October 2008 through April 2009 by $784,000;
- Maintained the 10-year warranty for the HP/IP turbine as if it were new equipment. While savings cannot be quantified, the value of this extended warranty is high, especially when considering the large risks of a turbine failure;
- Negotiated the reinstatement of the performance guarantees for the HP/IP turbine as if it were new equipment. The value of this settlement will only be known after the termination of the guarantees, but PSNH believes that it could be worth millions of dollars over the life of the turbine;
- PSNH deferred making $7 million in performance payments to Siemens from May 2008 until December 2009, saving approximately one million dollars.

Accion believes PSNH made the correct judgment in its global approach for two reasons. PSNH protected its customers against future damage claims that may result from future HP/IP problems and assured the preservation of the economics of the project as originally envisioned for customers. Accion believes that this approach in turn kept Siemens very sharp in their rework efforts at their facility in North Carolina.

In addition to the these credits, customers were insulated from replacement power costs due to PSNH procuring insurance. Because this outage was more than 60 days after the initial event, all replacement power costs were covered by insurance other than those that would have taken place despite the outage. In that regard, PSNH did have to credit the normal 4-week maintenance outage that would have taken place during the spring of 2009, so 14 weeks of replacement power costs (out of 18 weeks) were covered by insurance.

Accion believes that if replacement power costs are contractually included in PSNH vendor contracts, customers will pay for those costs through higher charges from the manufacturer.

PSNH customers received an additional benefit that is not so evident. The fact that MK-2 ran for 18-months instead of the normal one year between maintenance outages, customers in essence received one-half of a maintenance outage for free (i.e., two weeks of replacement power costs). Accion estimates customer savings for these two weeks of replacement power cost savings to be noteworthy. For each day PSNH received insurance payment for replacement power costs for MK-2, customers received $77,000 for each $10/MWH differential between MK-2 and the market energy price (320MW x $10 x 24 hours). That represents $1.1 million in savings for the two-week reduction in the maintenance cycle mentioned above for each $10/MWH of energy differential to market price.

To date, PSNH submitted claims totaling $13,871,020 for replacement power costs from July 2008 through December 2009, $3,000,000 has been received, and $10,871,020 is outstanding. Also to date, PSNH submitted $19,800,211 in boiler and machinery claims, with another $1,215,874 of claims yet to be submitted, $13,000,000 has been received from the insurance company, and $8,016,085 is outstanding subject to a $1,000,000 deductible.

Accion considers its review of this outage complete, recommends that PSNH file a report with the Commission with the final figures regarding insurance payments when known.

Outage New 1C and Outage NEW 1-D

The repair/cost of the Newington exciter was approximately $1.8 million. The insurance policy had a $1 million deductible clause, which PSNH paid. Insurance paid the remaining $800,000, which has been credited to customers. All payments have been received and this issue is financially closed.

Accion believes that PSNH customers actually received $800,000 in benefit from this outage. PSNH customers essentially traded a 35-year old exciter for a brand new exciter discounted to a price of $1 million. The exciter was becoming obsolete and was on the planning horizon for replacement and customers would have then had to pay the entire $1.8 million as a normal cost of doing business. The value of the Newington exciter was included in the global Siemens settlement surrounding the Merrimack 2 HP/IP turbine.

Accion considers its review of this outage complete and recommends closure.

2 – Schiller Warranty Items

From Section II-A of the Stipulation, PSNH agreed to submit a report by February 1, 2010, regarding the issues of Alstom's warranty (and performance) issues relating to the outages at Schiller-5 and to continue to file such reports until all issues are resolved.

On February 1, 2010, PSNH filed its first report in this regard. Accion presents its discussion on an issue by issue basis below:

Air Damper Shaft Linkage Workmanship

The issues stemmed from an outage where the air damper shaft was not attached. PSNH believed the issue was due to workmanship issues.

The entire linkage was replaced by Alstom at their cost. After a year of operation, PSNH made additional non-warranty improvements at their cost to ensure long-term reliability operation of the unit.

PSNH considers this issue closed.

Inlet Header Economizer Tube Stress Cracks

A leak had occurred at the economizer inlet tube after the warranty period had expired. Investigation revealed that the stress crack did not show up in non-destructive examination conducted in the previous spring. PSNH conducted non-destructive examination of the remaining similar welds and found no issues.

Both PSNH and Alstom concluded that this was an isolated incident, that it occurred after warranty, and that it is not covered under warranty.

PSNH considers this issue closed.

Forced Draft and Induced Draft Fan Capabilities Under Soft Start Conditions

During a start-up in February of 2008, the forced draft fan faulted. The repair used a higher class of insulation (type H versus installed type F) to endure soft start conditions. PSNH discovered that the induced draft fan has the same issue. PSNH has ordered new

FD and ID fan motors capable of soft start capability. PSNH will rewind the existing motors to specifications and retain them as spares.

Soft start capability was requested by PSNH by design. This item is still in negotiations.

Alarm Point Mis-set

PSNH fount that the inboard bearing on the forced draft was hot when bearing oil filter plugged. The bearing should have alarmed at 90^{o} C but did not as Alstom set the bearing alarm at 100^{o} C. The bearing reached 95^{o} C and was not damaged. PSNH set the alarm point to the proper value, checked other alarm point settings, and found no major problems.

With no damage, there is no warranty issue and PSNH considers the issue closed.

Inlet Duct Design

The inlet duct experienced vibration and required additional stiffening. Alstom redesigned the inlet duct and the complete physical modification was made at Alstom's cost.

PSNH considerers this issue closed.

Induced Draft Fan Circuit Board Failure

The induced draft fan tripped when an associated circuit board failed which then tripped the unit.

Both PSNH and Alstom concluded that this was an isolated incident, that it occurred after warranty, and that it is not covered under warranty.

PSNH considers this issue closed.

Vortex Finder Design

Alstom completed Vortex Finder repairs and attachment upgrades in 2007 under warranty. The Vortex Finder failure occurred when the lower half of one Vortex Finder failed at a factory weld in 2008. PSNH installed a new and redesigned Vortex Finder in 2008 and replaced the remaining 5 Vortex Finders in 2009 at its cost.

With no warranty, PSNH considers this matter closed.

Air Heater Design

The air heater has experienced excessive leakage due to air heater corrosion and tube failures. The air heater leaks result in the unit operating at reduced loads and difficulty in controlling the bed materials. The costs of this re-tubing and other air heater design issues are being discussed with Alstom under contract claims provisions.

PSNH retubed a portion of the air heater in 2009 and installed new sleeves in 2010.

This item and other air heater design issues remain open and in negotiations. PSNH is going to mediation in accordance with the contract.

Accion agrees with the PSNH resolution of the items to date and considers the resolutions reasonable. Accion recommends that Item 2 remain open and that PSNH file an update prior to the review of the 2010 Stranded Cost recovery Charge.

3 - Review of Isophase Bus Duct at Merrimack and Schiller Stations

From Section II-A of the Stipulation, PSNH agreed to perform an evaluation of the need for isophase bus duct heaters at Merrimack and Schiller stations.

In response to STAFF 01-033, PSNH filed its evaluation of the need for bus duct heaters at Merrimack and Schiller stations. PSNH engaged Eaton Electric to perform the evaluation.[1] Eaton noted that the failure at W. F. Wyman #4 was on a long run (200 feet) of non-segregated bus, not on the isophase bus as reported. Eaton investigated each section of non-segregated bus and isophase bus at both Schiller and Merrimack. Their conclusion was that both Merrimack and Schiller stations are at low risk of bus duct failures because:

- Merrimack and Schiller stations do not have long runs on non-segregated bus duct
- Non-segregated bus duct is limited at the station and is routinely cleaned and tested during annual overhauls.

Eaton Electric does not recommend installation of bus duct heaters at either Merrimack or Schiller stations. Eaton Electric also notes that much of the non-segregated bus duct is within the plant and thus in a heated environment that is much less likely to be subjected to moisture conditions.

Accion accepts PSNH‘s report and recommends that bus duct heaters are not required at Merrimack and Schiller stations for reliable operations.

Accion recommends closure of this Stipulation item.

4 - Review of Low Oil Alarm Procedures

From Section II-A of the Stipulation, PSNH agreed to review its procedures when a low oil alarm for hydro unit bearings is received at the Electric-System Control Center (E-SCC).

[1] Eaton Electric made the bus duct heater repairs at W. F. Wyman #4. That Wyman #4 outage was the outage that generated this recommendation.

In response to STAFF 01-034, PSNH filed its report regarding its review of its procedure when a low oil alarm is received by the E-SCC dispatcher. The concern was that “low oil” could be “no oil” resulting in damage to the unit’s bearings. The PSNH determination was that no changes should be made to dispatcher action upon the receipt of a “low oil” alarm because a unit shutdown is initiated if a “low oil” alarm is received. When an alarm is received, a field investigation is performed prior to restarting the unit. In addition, the PSNH evaluated the trip point settings and determined that they were adequate to prevent damage.

PSNH also states that it began upgrading the “low oil” protection system on hydro bearings late in 2008. The upgrade provides for two sensing devices. The first device will provide an alarm for “low oil” (or “no oil”) much like the current system, but also includes a controlled shutdown of the unit at a preset high bearing temperature which protects the integrity of the bearing. PSNH plans to have the upgraded protection systems installed on all hydro units by the end of 2010.

Accion accepts PSNH’s review of the dispatcher action when a “low oil” alarm is received as a reasonable approach to the issue carried out over a reasonable timetable. Accion also notes that the PSNH procedure was not clear at the time its recommendation was made in that an operator would be dispatched to the unit generating the alarm prior to restarting the unit.

Accion recommends closure of this Stipulation item.

5 - Interconnection of PSNH Generating Units to the PSNH Distribution System

From Section IIA of the Stipulation, PSNH agreed to perform an interconnection analysis of all its units connected to its lower voltage distribution system. The reason for the analysis is that over the years, many incorrect unit trips occurred for unrelated system outages. This analysis is an effort to determine if protection coordination is part of the problem. PSNH additionally committed to file a report on its progress on this matter to date along with an estimated completion schedule with the Commission for review in the 2009 Stranded Cost Recovery Review.

PSNH filed a progress report with the Commission in this regard on May 7, 2010. As of April 30, 2010, PSNH had completed its under voltage study of the units, issued letters for relay setting changes, and completed field changes. PSNH found that most of the under voltage relays were set approximately 33 percent higher than they should have been. The protection margin at the Canaan hydro station is less than desirable because of the long lines and light loadings in the area, but is deemed adequate by PSNH.[2] These settings would account for some of the over trip outages.

[2] Accion notes that many of the over trips occurred at Canaan and suspects that other coordination issues exist in this area of the system due to the topology of the system.

PSNH is in the process of completing protection coordination studies[3] and has completed the studies at two hydro stations. These stations were analyzed to coordinate with major construction activity occurring at these stations. PSNH has plans to conduct other station coordination studies with other construction activity (requiring coordination studies themselves) that will take place in the near future.

In 2011, Gorham coordination analysis will be completed as part of the planned transformer replacement and Hooksett coordination analysis will be completed as part of the planned breaker replacement. In addition, Cannan coordination will be analyzed in an attempt to improve coordination and reduce unit trips with no projects planned.

PSNH did not include the Schiller combustion turbine in its low voltage analysis because the combustion turbine's normal connection is to the 115kV system and not the lower voltage distribution system. As part of the current review process, PSNH has agreed to include this unit in its analysis.

PSNH is just beginning its evaluation of the settings of over speed relays for these units.

Accion believes that good progress is being made in both understanding the issues caused by poor distribution coordination and in addressing them. Accion recommends that this Stipulation item remain open and that PSNH file an additional report with the Commission prior to review of the 2010 Stranded Cost Recovery Charge.

6 - Establish a Relay Test Program

From Section II-A of the Stipulation, PSNH agreed to establish a formal relay test program for all its units connected to the lower voltage distribution system as review found that one was not in place. PSNH additionally committed to file a report on its progress on this matter to date along with an estimated completion schedule with the Commission for review in the 2009 Stranded Cost Recovery Review.

PSNH filed a progress report with the Commission in this regard on May 7, 2010. As of April 30, 2010, PSNH had completed placing the NPCC relay testing program in place for under frequency load shedding relays for those stations where NPCC compliance is applicable and has completed the required NPCC relay testing.

For station relays subject to NPCC relay testing requirements, PSNH created the Generation Protection System Maintenance and Testing Procedure (GEN 8114). All applicable relays have been tested. For station relays not subject to NPCC testing requirements, PSNH created the PSNH Hydro, Protective Relay Test Procedure. All applicable relays have been tested.

[3] Protection coordination studies are performed to ensure that system protection equipment such as relays, circuit breakers, fuses, etc. operate in the proper sequence. For example, a fuse on a remote line tap should operate prior to a recloser halfway back to the substation, which should operate before operation of the substation circuit breaker.

Again, PSNH did not include the Schiller combustion turbine in its low voltage analysis because the combustion turbine's normal connection is to the 115kV system and not the lower voltage distribution system. As part of the current review process, PSNH has agreed to include this unit in its analysis.[4]

Accion recommends closure of this Stipulation item.

7 - Evaluate Procurement of Critical Spare Generator and Turbine Components, Physically or Contractually

From Section II-A of the Stipulation, PSNH agreed to perform an evaluation of procuring spare critical generator and turbine components or entering into arrangements with others (i.e. vendors, manufacturers, etc.) to reduce the risk of catastrophic failures.

PSNH made the determination that procurement of spare parts for critical components should be done on a case-by-case basis. No formal evaluations were made or formal contracts were put into place. PSNH reasoning was that

- PSNH held extensive discussions with Siemens on this topic. Siemens informed PSNH that few utilities have spare steam turbine or generator components and some that do, are upgrading those components to gain efficiency (renders spares useless)
- Up-front cost can run into millions of dollars
- There are storage issues such as space, cost, and controlled atmosphere
- Some major components that fit many units are now in "seed" programs[5]
- Major suppliers are improving steam turbine blade fabrication time
- PSNH has an inventory of spare critical components and continues to add to it as warranted. Those items include a spare Schiller LP rotor (had 3 units), MK-2 extension shaft (rebuilt old), in process of procuring Newington ID and FD fans (rebuild old), and MK-2 generator stator coils
- Utility cooperation has decreased markedly with competition requiring each utility to bear all costs

Accion accepts PSNH reasoning that unless a business case can be made under deregulated market conditions that major spare components should be procured on a case-by-case basis. Accion recommends that this Stipulation item be closed.

[4] Accion notes that due to the 115kV normal connection for this unit, it is subject to much stricter relay testing requirements.

[5] For example, Newington received a seed exciter when its exciter failed. The Newington exciter became the seed exciter and ironically that exciter replaced the Merrimack 2 exciter upon its failure.

8 - Hold Manufacturers Responsible for Unreasonable Delays of Shipments of Major Components and Have Shipment Plans in Place

From Section II-A of the Stipulation, PSNH agreed to ensure that contractual arrangements with the manufacturer will hold the manufacturer responsible for unreasonable (shipping) delay of and that the manufacturer have plans in place for shipping major components.

PSNH engaged Siemens to review transportation policies with consideration of the following points:

- Unit outage schedules are approved by ISO-NE and once approved, they are finalized
- Detailed shop inspection can markedly change return schedule based on the condition of the component as determined by the inspection
- Pre-confirm weights and widths so they can be factored into transportation plan (permit or non permit load by state), work plan, and schedule
- Perform as much field work as possible
- Use of professional transportation experts who know where shipping restrictions may occur

Based on these discussions, PSNH has implemented changes to its outage scheduling. For items that are on or close to critical path, the outage start day will begin to optimize transportation logistics so outage time is minimized because of transportation delays (permit loads, construction restrictions etc.) PSNH will also hold formal discussions with the vendor's transportation department as warranted to seek shortest schedule considering potential contingencies.

PSNH implemented this procedure during the repair of the Merrinmack-2 HP/IP turbine in 2009. During that outage, Siemens committed to a firm return date in its contract. Discussions were held with Siemens at least twice a week during the outage to determine schedule changes based on Siemens shop schedules and revised transportation plans were made. PSNH in turn factored these changes into its work force scheduling to take advantage of any schedule gains. At one point during the outage, Siemens was at least one week ahead of schedule, committed to try and meet the revised schedule, but also reminded PSNH that its contractual return date remained as stated in the signed contract.

PSNH contractually burdens the vendor and trucking company with the obligation to "carry safely" and "arrive timely".

Accion believes that the process worked well and that both PSNH and Siemens were well in tune with what the other party was doing. Accion recommends that due to the critical nature and financial consequences to customers from transportation mishaps, that PSNH evaluate if additional tools such as GPS, speed and shock recorders, or other devices or methods should be employed to further augment its "carry safely" and "arrive timely" goals. Upon agreement by PSNH with the preceding recommendation, Accion recommends closure of this Stipulation item.

9 - Perform Own Review of Maintenance Outage Cycle Extensions

From Section II-A of the Stipulation, PSNH agreed to perform its own analysis of outage maintenance cycle extension rather than rely solely on the manufacturer's recommendation associated with major components.

This item was made an issue due to Accion's experience reviewing other utilities' generating unit outages. Accion noted that manufacturers were recommending the extension of maintenance time for some major generator and turbine components. These recommendations were accepted by the utility (most likely to gain efficiency in a competitive market) and major failures sometimes occurred prior to reaching the extended maintenance cycle.

PSNH states that manufacturer recommendations are an important technical input to the maintenance decision making process, but do not dictate the timing or the scope of the work to be performed. PSNH also factors in last repairs, current condition, historical knowledge, non-destructive examination information, PSNH equipment specialist's experience, the number of starts/stops, and hours of operation into its decision.

Accion accepts PSNH's approach for maintenance cycle outage planning. Accion recommends closure of this Stipulation item.

10 - Transmission and Distribution Personnel Protocol in Substations Containing PSNH Generating Units

From Section III-D of the Stipulation, PSNH agreed to establish a protocol for transmission and distribution workers performing activities in substations containing PSNH generating units.

PSNH established and implemented a protocol for transmission and distribution workers performing activities in substations containing PSNH generating units and has integrated the protocol into its key card access system and dispatcher notification requirements. PSNH hydro access policy requires that each access request be decided on an individual basis. Work activities are prioritized according to the level of work to be performed in relation to the potential to cause a unit outage. For example, delivering a part to the job site is a lower priority than snow removal within the station which in turn is a lower priority than performing electrical testing on station equipment.

All Northeast Utilities (NU) employees must be trained to the level of work being performed in order to oversee that work. Non-employees cannot have unescorted access and NU escorts may only escort persons of their skill level or lower.

Accion accepts PSNH's protocol for work activity in PSNH generating stations. Accion recommends that this Stipulation item be closed.

11 – Other Agreements

From Section II-A of the Stipulation, PSNH accepted the recommendation that National Electrical Safety Code patrols be performed on all distribution facilities on a four-year schedule.

From Section II-A of the Stipulation, PSNH accepted the recommendation that PSNH address danger trees outside of the 34.5kV right-of-way and determine where PSNH does and does not have rights to remove such danger trees.

Both of these recommendations were transferred to the PSNH 2009 Reliability Enhancement Improvement Program review contained in the then current PSNH distribution rate case review, Docket DE 09-035 where they would be addressed.

Accion has no analysis or recommendations regarding these two stipulated items.

Accion Recommendation Summary

1 - Mitigation of Customer Costs Related to Certain 2008 Generating Unit Outages

- Leave Outage MK-2E open - Capture final monetary resolution and file report with Commission prior to the next SCRC.
- Close Outage NEW 1-C – Commitment satisfied.
- Close Outage NEW 1-D – Commitment satisfied.

2 – Schiller Warranty Items

- Close Air Damper Shaft Linkage Workmanship – Issue resolved.
- Close Inlet Header Economizer Tube Stress Cracks – Issue resolved.
- Leave open Forced Draft and Induced Draft Fan Capabilities Under Soft Start Conditions – Negotiations still in progress.
- Close Alarm Point Mis-set – Issue resolved.
- Close Inlet Duct Design – Issue resolved.
- Close Induced Draft Fan Circuit Board Failure – Issue resolved.
- Close Vortex Finder – Issue resolved.
- Leave open Air Heater Design – Negotiations still in progress.

- File report with Commission on remaining open items prior to the 2010 Stranded Cost Recovery Charge review.

3 - Review of Isophase Bus Duct at Merrimack and Schiller Stations

- Close – Commitment satisfied.

4 - Review of Low Oil Alarm Procedures

- Close – Commitment satisfied.

5 - Interconnection of PSNH Generating Units to the PSNH Distribution System

- Leave open – Analysis and implementation incomplete. PSNH to include Schiller CT in its analysis and a review of over unit speed relays. File additional report with the Commission prior to the 2010 Stranded Cost Recovery Charge review.

6 - Establish a Relay Test Program

- Close – Commitment satisfied.

7 - Evaluate Procurement of Critical Spare Generator and Turbine Components, Physically or Contractually

- Close – Commitment satisfied.

8 - Hold Manufacturers Responsible for Unreasonable Delays of Shipments of Major Components and Have Shipment Plans in Place

- Close on contingent basis – Commitment completed upon PSNH acceptance of additional recommendation of further review.

9 - Perform Own Review of Maintenance Outage Cycle Extensions

- Close – Commitment satisfied.

10 - Transmission and Distribution Personnel Protocol in Substations Containing PSNH Generating Units

- Close – Commitment satisfied.

11 – Other Agreements

- Not applicable to this review – NESC inspection frequency and danger trees are now part of Docket DE 09-035.

Public Service Company of New Hampshire	**Data Request STAFF-01**
Docket No. DE 10-121	**Dated: 06/16/2010**
	Q-STAFF-002
	Page 1 of 2

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Baumann testimony, Attachment RAB-2. Please provide a schedule in the same format as the response to STAFF-01, Q-STAFF-001 in DE 09-091 detailing the calculation of replacement power costs. Please specifically detail any changes in the calculation method as compared to prior years.

Response:
There were no differences in calculation methodology as compared to previous submittals.

The replacement power costs were calculated hourly. For each hour, all supply resources (owned units, IPPs, bilateral purchases and ISO-NE spot purchases) were ordered based on their estimated dispatch prices from lowest cost to highest cost. The hour's actual energy expense was estimated by adding up the expenses of the resources whose output added up to the load. In a subsequent analysis, the unit out of service was placed back into the supply stack at an assumed availability and at the appropriate place in the dispatch order. The hour's energy expense was then recalculated as if the unit had been available. The replacement power cost was the difference in the cost to serve load between the two analyses.

The attached table summarizes by day the replacement power cost for each outage reported in RAB-2. The table lists each day's total replacement power costs, replacement power costs attributable to ISO-NE spot market purchases, replacement power costs attributable to bilateral purchases, replacement power costs attributable to PSNH generation and the avoided fuel expense attributable to the unit out of service.

	Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
Merrimack 1	04/20/2009	(40)	0	0	0	(40)
	04/21/2009	1,239	0	0	1,350	(110)
	04/22/2009	6,505	26,261	0	3,049	(22,804)
	04/23/2009	8,420	21,857	0	2,485	(15,922)
	04/24/2009	328	0	0	329	(1)
	Total	16,452	48,118	0	7,213	(38,879)
	07/21/2009	(3,790)	30,516	0	0	(34,306)
	07/22/2009	(1,324)	46,691	41,577	106	(89,699)
	07/23/2009	31,435	11,638	0	22,554	(2,758)
	07/24/2009	6,884	564	0	6,352	(32)
	Total	33,204	89,410	41,577	29,012	(126,796)
	10/26/2009	19,133	20,098	0	7,766	(8,730)
	10/27/2009	43,095	29,302	0	30,621	(16,827)
	10/28/2009	44,619	32,281	0	29,267	(16,930)
	10/29/2009	44,139	20,527	0	35,724	(12,112)
	10/30/2009	38,213	6,835	0	35,250	(3,872)
	Total	189,199	109,043	0	138,627	(58,471)
	12/01/2009	17,277	47,210	0	0	(29,933)
	12/02/2009	30,144	105,554	0	9,177	(84,586)
	12/03/2009	21,174	57,370	58,702	0	(94,898)
	12/04/2009	17,738	73,423	40,605	0	(96,290)
	12/05/2009	(651)	11,341	0	0	(11,991)
	Total	85,682	294,897	99,308	9,177	(317,699)
Merrimack 2	02/12/2009	36,151	99,851	19,559	0	(83,258)
	02/13/2009	98,370	98,916	213,626	0	(214,172)
	02/14/2009	96,761	154,272	148,089	0	(205,600)
	02/15/2009	99,619	141,200	146,820	0	(188,401)
	02/16/2009	78,894	302,398	0	0	(223,504)
	02/17/2009	14,875	57,095	0	0	(42,221)
	Total	424,670	853,733	528,094	0	(957,157)
	02/25/2009	25,031	114,496	0	0	(89,465)
	02/26/2009	60,361	164,104	124,268	0	(228,011)
	02/27/2009	23,444	77,572	97,840	0	(151,968)
	Total	108,836	356,172	222,107	0	(469,444)
	04/02/2009	468	3,389	0	0	(2,921)
	04/03/2009	48,201	54,800	0	9,320	(15,920)
	04/04/2009	43,407	112,901	0	4,367	(73,861)
	04/05/2009	36,847	100,654	0	2,663	(66,470)
	Total	128,923	271,745	0	16,350	(159,173)
	05/11/2009	26,460	45,861	0	2,463	(21,864)
	05/12/2009	64,109	131,653	0	1,373	(68,917)
	05/13/2009	61,499	129,440	0	1,726	(69,666)
	05/14/2009	63,562	143,329	0	2,573	(82,340)
	05/15/2009	79,908	150,406	0	234	(70,733)
	05/16/2009	46,480	78,527	0	1,829	(33,876)
	Total	342,017	679,216	0	10,197	(347,397)
	06/26/2009	73,294	24,108	0	64,641	(15,455)
	06/27/2009	49,675	54,563	0	22,328	(27,217)
	06/28/2009	23,071	21,261	0	12,323	(10,512)
	Total	146,040	99,932	0	99,292	(53,184)
Newington	10/06/2009-10/11/2009	0	0	0	0	0
	Total	0	0	0	0	0
Schiller 4	01/05/2009	(649)	4,802	0	89	(5,540)
	01/06/2009	(4,117)	49,002	0	0	(53,118)
	01/07/2009	(1,788)	48,050	0	0	(49,837)
	01/08/2009	4,950	31,818	0	4,185	(31,053)
	01/09/2009	9,995	50,987	0	2,441	(43,433)
	01/10/2009	20,313	0	0	20,313	0
	Total	28,704	184,658	0	27,028	(182,982)
	12/08/2009	(4,303)	13,374	0	0	(17,677)
	12/09/2009	2,700	2,072	0	3,705	(3,077)
	12/10/2009	(1,058)	5,978	0	0	(7,036)
	12/11/2009	769	8,971	0	0	(8,201)
	12/12/2009	6,160	0	0	6,160	0
	12/13/2009	0	0	0	0	0
	Total	4,267	30,395	0	9,864	(35,992)
Schiller 5	01/26/2009	20,272	0	0	20,272	0
	01/27/2009	31,189	0	0	31,189	0
	01/28/2009	23,491	12,803	0	20,814	(10,126)
	01/29/2009	1,419	14,311	29,139	135	(42,165)
	01/30/2009	8,184	5,048	22,265	3,141	(22,269)
	01/31/2009	106	0	0	106	0
	Total	84,661	32,162	51,404	75,656	(74,561)
	10/01/2009-10/06/2009	0	0	0	0	0
	Total	0	0	0	0	0
	11/20/2009-11/25/2009	0	0	0	0	0
	Total	0	0	0	0	0
	12/13/2009	3,766	13,422	0	1,638	(11,294)
	12/14/2009	2,833	7,062	0	1,064	(5,294)
	12/15/2009	1,243	9,450	0	107	(8,315)
	12/16/2009	7,198	6,129	0	4,355	(3,286)
	12/17/2009	7,267	0	0	7,267	0
	Total	22,306	36,063	0	14,431	(28,187)
Schiller 5	05/04/2009-05/08/2009	0	0	0	0	0
	Total	0	0	0	0	0
	Total All Units 2009	**1,614,964**	**3,085,545**	**942,490**	**436,849**	**(2,849,920)**

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-003
Page 1 of 1

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Bauman testimony, Attachment RAB-2. Please supply the replacement power costs associated with the planned outages at:

a. Merrimack-2 from 8/1/09 to 12/6/09;
b. Newington from 3/6/09 to 3/18/09;
c. Schiller-5 from 3/29/09 to 4/21/09; and
d. Schiller-6 from 8/28/09 to 10/4/09.

Response:
Below are the replacement power costs for the subject planned outages using the same methodology used to calculate replacement power costs for forced outages.

Unit	Start Date	End Date	PSNH RPC
MK2	08/01/2009	12/06/2009	$13,800,175
Newington	03/06/2009	03/18/2009	$0
SR5	03/29/2009	04/21/2009	$583,225
SR6	08/28/2009	10/04/2009	$0

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-008
Page 1 of 1

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Mr. Cannata's testimony in Docket DE 09-091, Exhibit MDC-2. Please provide the 2009 data necessary to update the following tables included in that exhibit:

a. "Historical Supplemental Purchases and Source"
b. "PSNH Historical FTR Costs and Savings"
c. "Actual and Projected Annual Capacity Factors for PSNH Major Units"

Response:

Following are the requested information.

a.

Historical PSNH Supplemental Purchases and Source

	Sup. Purchases (GWH)	LT Bilateral (%)	ST Bilateral (%)	ISO-NE Spot (%)
On-Peak				
2009	1,703	90%	3%	7%
Off-Peak				
2009	1,139	85%	2%	13%

b.

PSNH Historical FTR Costs and Savings ($)

Year	Auction Cost $	Avoided Congestion Cost $	Net Cost $
2009	9,590	121,850	-112,260

c.

2009 Actual and Projected Annual Capacity Factors
for PSNH Major Units
(Annual Generation/Winter Rating/8760)

	Actual	Forecasted *
MK1	83.14%	88.27%
MK2	55.82%	77.15%
SR4	58.15%	76.36%
SR5	79.46%	75.73%
SR6	54.87%	70.44%
Newington	5.18%	6.91%

* as forecast in December 2, 2008 filing, Newington was revised downward in mid-year rate revision filing.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-009
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 1, lines 16-19. Please describe PSNH's 2009 strategies to a) procure each energy product from the market to supplement PSNH resources, b) procure capacity to supplement PSNH resources, and c) acquire FTRs for each unit to manage congestion. If those strategies have changed from 2008, please explain the changes and reasoning for those changes.

Response:
The supplemental energy, supplemental capacity and FTRs purchase strategies for 2009 were not materially different from what was done for 2008.

PSNH's supplemental energy purchase strategy for 2009 was consistent the supplemental energy purchase strategy described in Section V.B.6 of the 2007 Least Cost Integrated Resource Plan, filed Sep 28, 2007 as supplemented on March 28, 2008 in Docket DE 07-108. A supplemental energy purchase plan was developed prior to 2009, and the plan was reviewed and executed while remaining flexible to account for changing conditions. 2009 supplemental energy purchases differed from 2008 in three areas: 1) supplemental energy purchases started in the fourth quarter of 2007 instead of the first quarter of 2008; 2) the last of the supplemental energy purchases for 2009 were made in early August 2008 because the depth and implications of the recession became apparent before the next set of energy purchases were to be made instead of continuing into the fall; and 3) replacement energy for the fall 2009 Merrimack 2 outage was purchased in January 2009 prior to the mid-year rate review but after the start of the year rate review. Details of the supplemental energy procured for 2009 are provided in response to STAFF-01, Q-STAFF-014.

During 2009, supplemental capacity was procured via the ISO-NE administered transition period capacity market. Exhibit DAE-5 summarizes the purchase activity.

PSNH procures FTRs to hedge the potential for congestion between significant supply resources (Merrimack, Schiller, Newington, and the delivery location for bilateral purchases, (e.g. the Mass. HUB) and the New Hampshire load zone. See responses to STAFF-01, Q-STAFF-023, Q-STAFF-024 and Q-STAFF-025 for additional information on 2009 FTR activity.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-010

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 3, lines 13-17. Please supply the customer migration assumptions (MW and MWH) used by PSNH by month in its 2009 capacity and energy purchases. As part of your response, please also supply the actual customer migration MW and MWH by month.

Response:
The first attachment titled "2009 Forecast and Actual Load and Migration Used in ES Rate Setting" shows the forecast load and migration levels assumed in setting ES rates in 2009 and actual load and migration levels. These forecast total energy requirements and migration levels are what were last assumed in rate setting. Energy purchases for 2009 started prior to these final assumptions and reflected different total energy requirements and migration levels over time. As noted in the response to Staff-01, Q-Staff-009, energy purchases, other than replacement energy purchases for the Fall 2009 Merrimack outage, started in late 2007 and ended in early August, 2008. The energy purchase activity ended primarily because total forecast sales were being lowered due to the recession and not because of migration concerns before the next set of energy purchases were to be made. The second attachment titled "Migration Applicable to Capacity Market Cost Allocation" shows actual migration through much of 2008 was not a key decision driver.

As noted in the response to Staff-01, Q-Staff-009 supplemental capacity was procured via the ISO-NE administered transition period capacity market and thus no capacity was purchased in advance.

	Rate Setting								Actual							
	Obligation - MW				Energy - MWhs				Obligation - MW				Energy - MWhs			
	Total		Migrated		Total		Migrated		Total		Migrated		Total			
2009	PSNH	ES		%	PSNH	ES		%	PSNH	ES		%	PSNH	ES	Migrated	%
Jan	2,325	2,183	142	6%	769,199	721,251	47,948	6%	2,358	2,148	210	9%	775,674	701,584	74,090	10%
Feb	2,325	2,183	142	6%	683,442	640,600	42,842	6%	2,371	2,124	247	10%	654,167	581,033	73,134	11%
Mar	2,403	2,256	147	6%	710,445	662,767	47,678	7%	2,503	2,212	291	12%	676,282	591,835	84,447	12%
Apr	2,403	2,256	147	6%	646,077	598,812	47,265	7%	2,502	2,159	343	14%	611,733	522,574	89,159	15%
May	2,403	2,256	147	6%	650,434	601,434	49,000	8%	2,509	2,125	384	15%	618,092	513,986	104,107	17%
Jun	2,190	1,798	392	18%	679,576	548,792	130,784	19%	2,322	1,893	429	18%	636,653	519,438	117,216	18%
Jul	2,190	1,798	392	18%	785,815	647,219	138,596	18%	2,296	1,834	462	20%	703,406	569,736	133,670	19%
Aug	2,190	1,798	392	18%	762,839	621,383	141,456	19%	2,292	1,790	502	22%	782,988	624,539	158,449	20%
Sep	2,190	1,798	392	18%	648,109	524,039	124,070	19%	2,299	1,752	547	24%	632,684	482,653	150,031	24%
Oct	2,406	1,975	431	18%	672,652	544,585	128,067	19%	2,532	1,888	644	25%	652,126	488,587	163,539	25%
Nov	2,406	1,975	431	18%	675,580	554,553	121,027	18%	2,528	1,854	674	27%	638,022	475,602	162,420	25%
Dec	2,329	1,912	417	18%	736,005	612,892	123,113	17%	2,462	1,779	683	28%	756,119	581,605	174,514	23%

Migration Applicable to Capacity Market Cost Allocation

Day	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08
1	2.8%	3.0%	3.0%	4.1%	3.8%	3.7%	2.5%	2.1%	1.5%	2.6%	4.7%	6.8%
2	2.8%	3.0%	3.0%	4.1%	3.8%	3.7%	2.5%	2.1%	1.5%	3.0%	4.7%	7.0%
3	2.8%	3.0%	3.0%	4.1%	3.8%	3.7%	2.4%	2.1%	1.5%	3.0%	5.0%	7.0%
4	2.7%	3.0%	2.7%	4.1%	3.8%	3.7%	2.4%	2.1%	1.5%	3.0%	5.1%	7.2%
5	2.7%	3.0%	2.7%	4.1%	3.8%	3.7%	2.4%	2.1%	1.5%	3.0%	5.1%	7.2%
6	2.7%	3.0%	2.9%	4.1%	3.8%	3.7%	2.4%	2.1%	1.5%	3.0%	5.1%	7.2%
7	2.7%	3.0%	3.0%	4.1%	3.8%	3.4%	2.4%	2.1%	1.5%	3.1%	5.4%	7.2%
8	2.8%	3.0%	3.0%	4.1%	3.8%	3.4%	2.4%	2.0%	2.1%	3.4%	5.4%	7.2%
9	3.0%	3.0%	3.0%	4.1%	3.7%	3.4%	2.4%	2.0%	2.1%	3.4%	5.4%	7.2%
10	3.0%	3.0%	3.0%	3.9%	3.7%	3.4%	2.4%	2.0%	2.4%	3.5%	5.4%	7.2%
11	3.0%	3.0%	3.0%	3.9%	3.7%	3.4%	2.4%	2.0%	2.3%	3.5%	5.4%	7.2%
12	3.0%	3.0%	3.0%	3.9%	3.7%	3.4%	2.4%	1.9%	2.3%	3.5%	5.6%	7.8%
13	3.0%	3.0%	3.1%	3.9%	3.7%	3.3%	2.4%	1.8%	2.3%	3.5%	6.0%	7.8%
14	3.0%	3.0%	3.6%	3.9%	3.7%	2.9%	2.4%	1.8%	2.3%	3.5%	6.4%	7.8%
15	2.9%	3.0%	3.6%	3.9%	3.7%	2.9%	2.4%	1.6%	2.3%	3.5%	6.4%	7.8%
16	2.9%	3.0%	3.6%	3.9%	3.7%	2.9%	2.1%	1.6%	2.4%	3.8%	6.4%	7.7%
17	2.9%	3.0%	3.6%	3.9%	3.7%	2.8%	2.1%	1.6%	2.4%	3.8%	6.6%	7.7%
18	2.9%	3.0%	3.8%	3.9%	3.7%	2.6%	2.1%	1.6%	2.4%	3.8%	6.6%	7.5%
19	2.9%	3.0%	3.8%	3.9%	3.7%	2.6%	2.1%	1.6%	2.6%	3.8%	6.7%	7.7%
20	2.9%	3.0%	4.0%	3.9%	3.7%	2.6%	2.1%	1.6%	2.6%	4.2%	6.7%	7.7%
21	3.0%	3.0%	4.0%	3.9%	3.7%	2.6%	2.1%	1.6%	2.6%	4.3%	6.7%	7.7%
22	3.0%	3.0%	4.0%	3.9%	3.6%	2.6%	2.1%	1.6%	2.6%	4.3%	6.7%	7.8%
23	3.0%	3.0%	4.0%	3.9%	3.6%	2.6%	2.1%	1.6%	2.6%	4.4%	6.7%	7.8%
24	3.0%	3.0%	4.0%	3.8%	3.6%	2.5%	2.1%	1.6%	2.6%	4.6%	6.7%	7.7%
25	3.0%	3.0%	4.1%	3.8%	3.6%	2.5%	2.1%	1.5%	2.6%	4.6%	6.7%	7.7%
26	3.0%	3.0%	4.1%	3.8%	3.6%	2.5%	2.1%	1.5%	2.6%	4.6%	6.7%	7.7%
27	3.0%	3.0%	4.1%	3.8%	3.6%	2.5%	2.1%	1.5%	2.6%	4.6%	6.7%	7.7%
28	3.0%	3.0%	4.1%	3.8%	3.6%	2.5%	2.1%	1.5%	2.6%	4.6%	6.7%	7.7%
29	3.0%	3.0%	4.1%	3.8%	3.6%	2.5%	2.1%	1.5%	2.6%	4.6%	6.7%	7.6%
30	3.0%		4.1%	3.8%	3.6%	2.5%	2.1%	1.5%	2.6%	4.7%	6.7%	7.6%
31	3.0%		4.1%		3.6%		2.1%	1.5%		4.7%		7.7%

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-011

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 2-3. Please explain and reconcile why the on-peak bilateral purchased energy dropped from 1795 GWH in 2008 to 1189 GWH in 2009. As part of your response, please include the impact of how the Merrimack–2 outage from August to December 2009 influenced on-peak bilateral purchases.

Response:
In comparing Attachments DAE-2 and DAE-3 in the 2009 filing to Attachments RCL-2 and RCL-3 in the 2008 filing an inconsistency was discovered. The bilateral on-peak purchases reported in DAE-3 are those that went to serve load and tie out to the percentages shown in DAE-2 rather than total bilateral on-peak purchases as was reported in RCL-3. The correct comparable 2009 value to RCL-3's 1,795 GWH is 1,589 GWH. The difference between 1,589 GWH and 1,189 GWH, 400 GWH, are bilateral purchases that ended up being on-peak energy sales and are further discussed in Staff-01, Q-Staff-016. Thus on-peak bilateral purchases in 2009 were lower than 2008 by 206 GWH, but would have been lower by 472 GWH had 266 GWH not been purchased to cover the long Merrimack 2 outage. See Staff-01, Q-Staff-009, for a discussion of PSNH's 2009 supplemental energy purchases.

Please find attached a comparison of Attachment DAE-2 in the 2009 filing with Attachment RCL-2 in the 2008 filing for the on-peak period. It shows that the primary reason for reducing on-peak bilateral energy purchases was due to lower ES loads, column (a). The lower loads are attributable to both the recession and migration. The drop in on-peak bilateral energy purchases would have been even greater but for the bilateral purchases made for August through November to cover the extended Merrimack 2 outage, see columns (r) and (v). Absent the extended outage at Merrimack 2 generation from owned and long-term resources in 2009 would have been greater than in 2008, see column (u). However, as noted in Staff-1, Q-Staff-009 the cessation of bilateral energy purchases in August 2008 was solely attributable to PSNH taking into account the implications of the recession and not as a result of forecasting migration.

A revised Attachment DAE-3 and the corresponding testimony Q and As consistent with the 2008 filing will be provided in a Testimony Supplement.

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)
	Attachment DAE-2 from 2009 Filing											2009 On Peak Resources to Serve Load									
	ES Load	IPP	Buyout Contracts	Vermont Yankee	Hydro	Merrimack and Schiller	Newington and Wyman	Combustion Turbines	PSNH Resource Sub-total	Bilateral Purchase	ISO-NE Spot Purchases	IPP	Buyout Contracts	Vermont Yankee	Hydro	Merrimack and Schiller	Newington and Wyman	Combustion Turbines	PSNH Resource Sub-total	Bilateral Purchase	ISO-NE Spot Purchases
Jan-09	353,075	6%	0%	2%	4%	50%	15%	0.00%	77%	19%	4%	19,967	360	6,618	13,917	178,161	52,517	0	271,540	67,144	14,391
Feb-09	295,226	6%	1%	2%	4%	48%	4%	0.00%	65%	28%	7%	16,872	2,747	6,258	11,209	142,668	10,973	0	190,726	83,520	20,979
Mar-09	303,286	9%	1%	2%	6%	60%	0%	0.00%	79%	20%	1%	26,169	3,360	7,023	19,428	182,511	423	0	238,914	61,908	2,464
Apr-09	290,318	9%	1%	2%	7%	54%	0%	0.00%	74%	25%	1%	25,948	3,520	7,015	21,344	155,827	61	0	213,716	73,315	3,288
May-09	257,824	7%	1%	3%	7%	52%	0%	0.00%	69%	26%	5%	16,911	3,200	6,489	17,287	133,676	0	0	177,564	67,592	12,668
Jun-09	291,889	7%	1%	2%	6%	55%	1%	0.00%	72%	28%	0%	19,057	3,520	6,633	17,108	159,455	3,864	0	209,637	80,864	1,388
Jul-09	327,057	7%	1%	2%	6%	48%	2%	0.00%	68%	29%	3%	24,393	2,988	7,480	20,571	158,217	7,947	13	221,609	94,736	10,713
Aug-09	317,525	5%	1%	2%	5%	20%	3%	0.07%	36%	54%	10%	17,242	1,912	6,310	15,883	64,898	8,108	227	114,580	171,020	31,925
Sep-09	260,609	6%	1%	3%	3%	21%	0%	0.00%	34%	66%	0%	15,547	3,040	6,831	7,443	54,977	0	0	87,837	171,961	811
Oct-09	262,830	7%	1%	3%	5%	24%	2%	0.03%	42%	57%	2%	17,929	3,520	7,310	12,710	63,112	4,901	73	109,555	148,833	4,442
Nov-09	240,824	9%	1%	3%	7%	26%	14%	0.00%	59%	40%	1%	22,738	3,200	6,265	16,159	62,107	32,620	0	143,089	96,417	1,317
Dec-09	308,955	9%	1%	2%	6%	52%	3%	0.00%	74%	23%	3%	27,454	3,377	7,341	18,541	161,270	9,446	0	227,430	71,726	9,800
2,009	3,509,419	7%	1%	2%	5%	43%	4%	0.01%	63%	34%	3%	250,226	34,744	81,572	191,602	1,516,879	130,862	313	2,206,197	1,189,036	114,185
	Attachment RCL-2 from 2008 Filing											2008 On Peak Resources to Serve Load									
Jan-08	391,615	8%	1%	2%	4%	45%	4%	0.03%	64%	30%	5%	32,135	2,160	7,346	17,346	177,930	15,325	105	252,347	119,145	20,123
Feb-08	364,528	9%	0%	2%	5%	48%	0%	0.04%	64%	30%	6%	32,228	1,107	6,978	18,412	175,972	116	158	234,971	109,313	20,244
Mar-08	347,295	8%	1%	2%	6%	46%	1%	0.02%	63%	34%	3%	28,423	3,360	6,803	19,780	159,230	1,843	55	219,494	116,834	10,967
Apr-08	337,827	6%	1%	2%	6%	21%	1%	0.00%	37%	62%	0%	21,058	3,520	6,698	20,256	70,847	3,744	0	126,123	210,680	1,024
May-08	320,488	5%	1%	2%	5%	31%	0%	0.00%	44%	55%	1%	16,889	3,200	6,861	16,193	98,796	168	0	142,108	176,711	1,669
Jun-08	374,450	3%	1%	2%	3%	39%	3%	0.03%	51%	47%	3%	10,946	3,360	6,273	12,551	145,717	10,368	109	189,324	174,979	10,147
Jul-08	438,297	3%	1%	1%	3%	34%	10%	0.00%	53%	39%	8%	13,681	3,120	5,725	13,945	149,990	45,573	17	232,051	169,975	36,271
Aug-08	375,717	4%	1%	2%	4%	48%	3%	0.07%	62%	34%	4%	15,234	2,110	6,455	15,782	181,876	10,296	276	232,030	127,197	16,490
Sep-08	348,268	4%	1%	2%	3%	39%	0%	0.01%	50%	40%	10%	13,782	3,040	6,390	12,092	137,060	0	42	172,405	140,965	34,898
Oct-08	355,340	5%	1%	1%	4%	45%	0%	0.02%	56%	29%	15%	16,059	3,680	3,779	15,648	159,034	0	73	198,273	103,499	53,569
Nov-08	299,481	6%	1%	1%	5%	48%	0%	0.02%	61%	30%	9%	16,794	3,040	4,258	15,247	144,206	335	55	183,934	89,282	26,264
Dec-08	354,119	7%	1%	2%	6%	52%	2%	0.04%	69%	25%	6%	23,925	3,520	7,298	19,606	184,793	5,651	145	244,937	89,259	19,923
2,008	4,307,426	6%	1%	2%	5%	41%	2%	0.02%	56%	38%	6%	241,154	35,217	74,865	196,857	1,785,450	93,420	1,035	2,427,997	1,627,839	251,589
											2009 from 2008										
Jan	(38,540)	(0.0)	(0.0)	(0.0)	(0.0)	0.1	0.1	(0.0)	0.1	(0.1)	(0.0)	(12,168)	(1,800)	(728)	(3,428)	231	37,192	(105)	19,192	(52,001)	(5,732)
Feb	(69,302)	(0.0)	0.0	0.0	(0.0)	0.0	0.0	(0.0)	0.0	(0.0)	0.0	(15,356)	1,640	(720)	(7,203)	(33,304)	10,857	(158)	(44,244)	(25,793)	735
Mar	(44,009)	0.0	0.0	0.0	0.0	0.1	(0.0)	(0.0)	0.2	(0.1)	(0.0)	(2,254)	0	220	(352)	23,281	(1,420)	(55)	19,420	(54,926)	(8,503)
Apr	(47,508)	0.0	0.0	0.0	0.0	0.3	(0.0)	0.0	0.4	(0.4)	0.0	4,890	0	317	1,089	84,981	(3,683)	0	87,593	(137,365)	2,264
May	(62,665)	0.0	0.0	0.0	0.0	0.2	(0.0)	0.0	0.2	(0.3)	0.0	23	0	(373)	1,094	34,880	(168)	0	35,456	(109,119)	10,999
Jun	(82,561)	0.0	0.0	0.0	0.0	0.2	(0.0)	(0.0)	0.2	(0.2)	(0.0)	8,111	160	360	4,557	13,739	(6,505)	(109)	20,313	(94,115)	(8,759)
Jul	(111,240)	0.0	0.0	0.0	0.0	0.1	(0.1)	0.0	0.1	(0.1)	(0.0)	10,711	(132)	1,755	6,626	8,227	(37,625)	(4)	(10,442)	(75,239)	(25,558)
Aug	(58,192)	0.0	0.0	0.0	0.0	(0.3)	(0.0)	(0.0)	(0.3)	0.2	0.1	2,008	(198)	(145)	101	(116,978)	(2,188)	(49)	(117,450)	43,823	15,435
Sep	(87,659)	0.0	0.0	0.0	(0.0)	(0.2)	0.0	(0.0)	(0.2)	0.3	(0.1)	1,765	0	442	(4,649)	(82,083)	0	(42)	(84,568)	30,996	(34,087)
Oct	(92,510)	0.0	0.0	0.0	0.0	(0.2)	0.0	0.0	(0.1)	0.3	(0.1)	1,870	(160)	3,531	(2,938)	(95,922)	4,901	(0)	(88,718)	45,335	(49,127)
Nov	(58,657)	0.0	0.0	0.0	0.0	(0.2)	0.1	(0.0)	(0.0)	0.1	(0.1)	5,944	160	2,007	913	(82,099)	32,285	(55)	(40,844)	7,135	(24,947)
Dec	(45,164)	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	3,529	(143)	43	(1,065)	(23,523)	3,795	(145)	(17,508)	(17,533)	(10,123)
Period	(798,007)	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	0.1	(0.0)	(0.0)	9,073	(473)	6,707	(5,255)	(268,571)	37,441	(722)	(221,800)	(438,803)	(137,404)

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-012
Page 1 of 1

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Errichetti testimony, page 4, lines 2-8. Please provide a schedule, by month, supporting how the 1189 GWH of on-peak bilateral purchased energy breaks down into the components listed with an average price for each and total.

Response:
As noted in Staff-01, Q-Staff-011, in comparing Attachments DAE-2 and DAE-3 in the 2009 filing to Attachments RCL-2 and RCL-3 in the 2008 reconciliation filing an inconsistency was discovered. The bilateral on-peak purchases reported in DAE-3 are those that went to serve load and tie out to the percentages shown in DAE-2 rather than total bilateral on-peak purchases as was reported in RCL-3. The correct comparable 2009 value to RCL-3's 1,795 GWH is 1,589 GWH.

Please see the table below for the requested information consistent with Supplemental Attachment DAE-3 which reflects total bilateral energy purchases.

	2009 On-Peak Bilateral Energy Purchases							
	Monthly		Unit-Contingent		Short-Term		Total	
	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh
Jan	67,200	$149	10,717	$83	9,600	$63	87,517	$132
Feb	60,800	$149	10,087	$83	24,800	$52	95,687	$117
Mar	84,000	$114	11,002	$71	0	$0	95,002	$109
Apr	140,800	$100	9,793	$71	0	$0	150,593	$98
May	80,000	$114	10,210	$71	0	$0	90,210	$109
Jun	123,200	$110	11,706	$71	3,200	$40	138,106	$105
Jul	110,400	$112	12,705	$83	4,800	$39	127,905	$107
Aug	160,000	$88	11,638	$83	4,800	$50	176,438	$87
Sep	184,800	$89	11,729	$71	0	$0	196,529	$88
Oct	158,400	$86	12,265	$71	0	$0	170,665	$85
Nov	144,000	$86	10,908	$71	0	$0	154,908	$85
Dec	88,000	$114	11,772	$71	5,600	$49	105,372	$105
Total	1,401,600	$103	134,533	$75	52,800	$51	1,588,933	$99

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-013
Page 1 of 1

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Errichetti testimony, page 4, lines 12-17. Please provide a schedule, by month, supporting how the 696 GWH of off-peak bilateral purchased energy breaks down into the components listed with an average price for each and total.

Response:
As noted in Staff-01, Q-Staff-011, in comparing Attachments DAE-2 and DAE-3 in the 2009 filing to Attachments RCL-2 and RCL-3 in the 2008 reconciliation filing an inconsistency was discovered. The bilateral purchases reported in DAE-3 are those that went to serve load and tie out to the percentages shown in DAE-2 rather than total bilateral purchases as was reported in RCL-3. The correct comparable 2009 value to RCL-3's 831 GWH is 994 GWH.

Please see the table below for the requested information consistent with Supplemental Attachment DAE-3 which reflects total bilateral energy purchases.

	2009 Off-Peak Bilateral Energy Purchases							
	Monthly		Unit-Contingent		Short-Term		Total	
	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh
Jan	56,800	$108	13,222	$61	1,600	$55	71,622	$99
Feb	51,200	$111	12,161	$61	8,800	$55	72,161	$96
Mar	37,950	$114	12,368	$54	0	$0	50,318	$99
Apr	68,000	$100	9,989	$54	0	$0	77,989	$94
May	38,800	$114	13,232	$54	0	$0	52,032	$98
Jun	31,200	$114	12,899	$54	9,600	$41	53,699	$86
Jul	31,600	$113	13,309	$61	0	$0	44,909	$98
Aug	126,000	$72	14,798	$62	4,800	$35	145,598	$70
Sep	110,400	$71	13,602	$54	0	$0	124,002	$69
Oct	112,400	$64	13,815	$54	0	$0	126,215	$63
Nov	116,250	$64	12,366	$54	0	$0	128,616	$63
Dec	34,000	$110	13,205	$54	0	$0	47,205	$94
Total	814,600	$86	154,965	$56	24,800	$46	994,365	$80

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-014

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 19-20. Please combine the total of the above two requests and add the ISO-NE hourly spot purchases to that total to support the combined expenses of $183 million.

Response:

As noted in Staff-01, Q-Staff-011, in comparing Attachments DAE-2 and DAE-3 in the 2009 filing to Attachments RCL-2 and RCL-3 in the 2008 reconciliation filing an inconsistency was discovered. The bilateral purchases reported in DAE-3 are those that went to serve load and tie out to the percentages shown in DAE-2 rather than total bilateral purchases as was reported in RCL-3. The correct comparable DAE-3 2009 value to RCL-3 in 2008 is $248.8 million.

Please see the attached table for the requested information consistent with Supplemental Attachment DAE-3 which reflects total bilateral energy purchases.

Composition and Summation of Total 2009 Supplemental Energy Purchases

	2009 Total Bilateral Energy Purchases								ISO-NE Spot		Total Supplemental Purchases		
	Monthly		Unit-Contingent		Short-Term		Total						
	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Avg $/MWh	MWh	Cost $000	Avg $/MWh
Jan	124,000	$130	23,938	$71	11,200	$62	159,138	$117	21,170	$70.38	180,308	20,059	$111.25
Feb	112,000	$132	22,248	$71	33,600	$52	167,848	$108	42,595	$49.98	210,444	20,207	$96.02
Mar	121,950	$114	23,370	$62	0	$0	145,320	$105	5,304	$67.34	150,624	15,658	$103.95
Apr	208,800	$100	19,782	$62	0	$0	228,582	$97	11,018	$40.36	239,599	22,514	$93.97
May	118,800	$114	23,441	$61	0	$0	142,241	$105	24,500	$40.51	166,741	15,930	$95.54
Jun	154,400	$111	24,606	$62	12,800	$41	191,806	$100	7,442	$34.16	199,248	19,375	$97.24
Jul	142,000	$113	26,014	$72	4,800	$39	172,814	$104	21,659	$36.87	194,473	18,853	$96.94
Aug	286,000	$81	26,436	$71	9,600	$43	322,036	$79	67,766	$43.37	389,802	28,480	$73.06
Sep	295,200	$82	25,332	$62	0	$0	320,532	$81	12,868	$31.35	333,400	26,239	$78.70
Oct	270,800	$77	26,080	$62	0	$0	296,880	$76	13,060	$41.83	309,940	23,011	$74.24
Nov	260,250	$76	23,274	$62	0	$0	283,524	$75	6,638	$49.81	290,162	21,623	$74.52
Dec	122,000	$113	24,978	$62	5,600	$49	152,578	$102	25,079	$50.45	177,656	16,830	$94.74
Total	2,216,200	$97	289,499	$65	77,600	$50	2,583,299	$92	259,099	$46.12	2,842,397	248,781	$87.53

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-015
Page 1 of 2

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 12-13. Please explain and reconcile why the off peak bilateral purchased energy dropped from 831 GWH in 2008 to 696 GWH in 2009. As part of your response, please include the impact of how the Merrimack–2 outage from August to December 2009 influenced off-peak bilateral purchases.

Response:
As noted in Staff-01, Q-Staff-011, in comparing Attachments DAE-2 and DAE-3 in the 2009 filing to Attachments RCL-2 and RCL-3 in the 2008 filing an inconsistency was discovered. The bilateral purchases reported in DAE-3 are those that went to serve load and tie out to the percentages shown in DAE-2 rather than total bilateral purchases as was reported in RCL-3. The correct comparable 2009 value to RCL-3's 831 GWH is 994 GWH. The difference between 696 GWH and 994 GWH, 298 GWH, are bilateral energy purchases that ended up being off-peak energy sales and are further discussed in Staff-01, Q-Staff-017. Thus off-peak bilateral energy purchases in 2009 were higher than 2008 GWH, but would have been lower by 157 GWH had 320 GWH not been purchased to cover the long Merrimack 2 outage. See Staff-01, Q-Staff-009, for a discussion of PSNH's 2009 supplemental energy purchases.

Please find attached attachment DAE-2 in the 2009 filing with Attachment RCL-2 in the 2008 filing for the off-peak period. It shows that the primary reason for reducing bilateral off peak energy purchases was lower ES loads, column (a). The lower loads are attributable to both the recession and migration. Bilateral off peak energy purchases would have been lower in 2009 than 2008 but for the bilateral purchases made for August through November to cover the extended Merrimack 2 outage, see columns (r) and (v). Absent the extended outage at Merrimack 2 generation from owned and long-term resources in 2009 would have been greater than in 2008, see column (u). However, as noted in Staff-1, Q-Staff-009 the cessation of bilateral energy purchases in August 2008 was solely attributable to PSNH taking into account the implications of the recession and not as a result of forecasting migration.

A revised Attachment DAE-3 and the corresponding testimony Q and As consistent with the 2008 filing will be provided in a Testimony Supplement.

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)
						Attachment DAE-2 from 2009 Filing										2009 Off Peak Resources to Serve Load					
	ES Load	IPP	Buyout Contracts	Vermont Yankee	Hydro	Merrimack and Schiller	Newington and Wyman	Combustion Turbines	PSNH Resource Sub-total	Bilateral Purchase	ISO-NE Spot Purchases	IPP	Buyout Contracts	Vermont Yankee	Hydro	Merrimack and Schiller	Newington and Wyman	Combustion Turbines	PSNH Resource Sub-total	Bilateral Purchase	ISO-NE Spot Purchases
Jan-09	348,510	7%	1%	2%	5%	62%	10%	0.00%	88%	10%	2%	25,170	2,580	8,327	16,364	217,124	35,910	0	305,474	36,257	6,779
Feb-09	285,807	7%	1%	3%	5%	58%	1%	0.01%	74%	18%	8%	20,926	2,496	7,687	13,494	165,516	2,573	17	212,708	51,484	21,616
Mar-09	288,549	11%	1%	3%	8%	69%	0%	0.00%	92%	7%	1%	31,884	3,920	8,504	23,310	197,771	86	0	265,475	20,234	2,840
Apr-09	232,255	12%	2%	3%	10%	56%	0%	0.00%	82%	14%	3%	28,381	3,680	6,513	22,204	130,391	8	0	191,176	33,349	7,730
May-09	256,162	9%	1%	3%	9%	63%	0%	0.00%	86%	10%	5%	23,534	3,760	8,699	22,428	160,862	0	0	219,283	25,047	11,831
Jun-09	227,548	9%	2%	3%	8%	61%	0%	0.00%	83%	15%	3%	20,154	3,680	7,142	18,137	138,744	0	0	187,857	33,637	6,054
Jul-09	242,678	11%	1%	3%	9%	61%	0%	0.00%	85%	11%	5%	25,778	3,440	7,603	21,131	147,679	32	0	205,662	26,070	10,946
Aug-09	307,014	8%	1%	3%	7%	25%	0%	0.00%	44%	44%	12%	23,389	3,121	8,470	21,781	77,537	278	12	134,588	136,584	35,841
Sep-09	222,044	8%	2%	4%	4%	28%	0%	0.02%	45%	50%	5%	17,776	3,680	7,774	7,814	62,536	0	52	99,632	110,354	12,057
Oct-09	225,757	9%	2%	4%	6%	30%	0%	0.01%	50%	46%	4%	20,801	3,920	8,117	13,533	66,879	602	24	113,877	103,261	8,618
Nov-09	234,778	12%	2%	3%	9%	30%	1%	0.05%	57%	41%	2%	28,129	4,010	8,150	20,472	69,647	2,506	123	133,036	96,421	5,320
Dec-09	272,650	11%	1%	3%	7%	62%	2%	0.00%	86%	8%	6%	30,513	2,570	8,182	19,864	168,172	4,987	0	234,288	23,083	15,279
2,009	3,143,751	9%	1%	3%	7%	51%	1%	0.01%	73%	22%	5%	296,435	40,857	95,166	220,533	1,602,858	46,981	228	2,303,058	695,780	144,914
						Attachment RCL-2 from 2008 Filing										2008 Off Peak Resources to Serve Load					
Jan-08	342,691	10%	1%	2%	6%	60%	2%	0.03%	81%	10%	9%	35,959	2,640	8,181	19,530	204,096	5,884	89	276,379	35,660	30,653
Feb-08	307,333	11%	1%	2%	6%	56%	0%	0.01%	77%	13%	10%	34,649	2,310	7,491	19,690	171,951	60	38	236,188	40,796	30,350
Mar-08	335,029	10%	1%	3%	7%	60%	0%	0.00%	81%	13%	6%	34,247	2,836	8,405	23,907	200,911	173	0	270,479	43,807	20,744
Apr-08	270,386	8%	1%	3%	8%	26%	0%	0.00%	46%	45%	9%	22,841	3,680	7,324	20,789	69,682	147	0	124,462	122,331	23,593
May-08	294,591	7%	1%	3%	7%	45%	0%	0.02%	62%	35%	3%	20,196	3,760	8,264	19,372	131,150	16	61	182,820	104,293	7,478
Jun-08	315,614	4%	1%	2%	4%	49%	3%	0.00%	65%	22%	13%	12,304	3,840	7,440	13,813	155,640	10,979	0	204,016	70,300	41,298
Jul-08	350,226	4%	1%	2%	4%	44%	2%	0.00%	57%	23%	19%	15,244	3,280	6,035	15,220	154,642	6,814	0	201,234	81,710	67,282
Aug-08	342,947	5%	1%	2%	6%	65%	0%	0.00%	79%	16%	5%	17,864	2,951	7,097	19,323	222,010	427	0	269,671	54,479	18,796
Sep-08	302,040	5%	1%	2%	5%	51%	0%	0.00%	64%	15%	22%	15,533	3,680	7,446	13,758	152,841	0	12	193,270	43,807	64,962
Oct-08	270,495	6%	1%	1%	6%	58%	0%	0.00%	72%	15%	13%	16,270	3,760	3,257	15,316	155,966	0	0	194,567	41,369	34,559
Nov-08	318,884	7%	1%	2%	7%	64%	0%	0.00%	81%	12%	7%	23,791	4,160	5,605	21,459	202,558	155	0	257,728	37,672	23,484
Dec-08	304,090	9%	1%	3%	7%	66%	0%	0.00%	85%	9%	5%	26,957	2,870	8,012	21,426	199,188	489	0	258,941	28,625	16,523
2,008	3,754,325	7%	1%	2%	6%	54%	1%	0.01%	71%	19%	10%	275,855	39,767	84,555	223,601	2,020,634	25,143	199	2,669,755	704,849	379,721
											2009 from 2008										
Jan	5,818	(0.0)	(0.0)	0.0	(0.0)	0.0	0.1	(0.0)	0.1	(0.0)	(0.1)	(10,789)	(60)	146	(3,166)	13,028	30,026	(89)	29,096	597	(23,874)
Feb	(21,526)	(0.0)	0.0	0.0	(0.0)	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(13,723)	186	196	(6,196)	(6,435)	2,513	(21)	(23,480)	10,688	(8,734)
Mar	(46,481)	0.0	0.0	0.0	0.0	0.1	(0.0)	0.0	0.1	(0.1)	(0.1)	(2,363)	1,084	99	(597)	(3,140)	(87)	0	(5,004)	(23,573)	(17,904)
Apr	(38,131)	0.0	0.0	0.0	0.0	0.3	(0.0)	0.0	0.4	(0.3)	(0.1)	5,540	0	(811)	1,415	60,709	(139)	0	66,714	(88,982)	(15,863)
May	(38,429)	0.0	0.0	0.0	0.0	0.2	(0.0)	(0.0)	0.2	(0.3)	0.0	3,338	0	435	3,056	29,711	(16)	(61)	36,463	(79,246)	4,354
Jun	(88,066)	0.0	0.0	0.0	0.0	0.1	(0.0)	0.0	0.2	(0.1)	(0.1)	7,850	(160)	(298)	4,324	(16,896)	(10,979)	0	(16,158)	(36,664)	(35,244)
Jul	(107,547)	0.1	0.0	0.0	0.0	0.2	(0.0)	0.0	0.3	(0.1)	(0.1)	10,533	160	1,568	5,912	(6,963)	(6,782)	0	4,428	(55,640)	(56,335)
Aug	(35,933)	0.0	0.0	0.0	0.0	(0.4)	(0.0)	0.0	(0.3)	0.3	0.1	5,525	170	1,373	2,458	(144,473)	(149)	12	(135,083)	82,105	17,045
Sep	(79,996)	0.0	0.0	0.0	(0.0)	(0.2)	0.0	0.0	(0.2)	0.4	(0.2)	2,243	0	328	(5,944)	(90,305)	0	40	(93,638)	66,547	(52,905)
Oct	(44,738)	0.0	0.0	0.0	0.0	(0.3)	0.0	0.0	(0.2)	0.3	(0.1)	4,532	160	4,861	(1,782)	(89,086)	602	24	(80,690)	61,892	(25,940)
Nov	(84,106)	0.0	0.0	0.0	0.0	(0.3)	0.0	0.0	(0.2)	0.3	(0.1)	4,338	(150)	2,544	(987)	(132,911)	2,351	123	(124,692)	58,749	(18,164)
Dec	(31,440)	0.0	(0.0)	0.0	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	3,556	(300)	170	(1,562)	(31,016)	4,498	0	(24,653)	(5,542)	(1,245)
Period	(610,574)	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.1)	20,580	1,090	10,611	(3,068)	(417,776)	21,838	28	(366,697)	(9,070)	(234,808)

Public Service Company of New Hampshire **Data Request STAFF-01**
Docket No. DE 10-121 **Dated: 06/16/2010**
Q-STAFF-016

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 21-28. Please provide a schedule, by month, by facility, supporting how the 401 GWH of on-peak energy was sold and the average price received.

Response:
Please see the attached table for the requested information. In this analysis energy sales were met in the following order: ICUs, bilateral energy purchases, Newington/Wyman, Schiller 6, Schiller 4, Merrimack 1, Merrimack 2, Schiller 5 and other.

2009 On-Peak

	Total ISO-NE Spot Sales MWh	Surplus Sales from ICU MWh	Surplus Sales from Bilateral MWh	Surplus Sales from Newington/Wyman MWh	Surplus Sales from SCH6 MWh	Surplus Sales from SCH 4 MWh	Surplus Sales from MK1 MWh	Surplus Sales from MK2 MWh	Surplus Sales from SCH 5 MWh	Surplus Sales from other MWh	Total ISO-NE Spot Sales $000	Avg Sale $/MWh
Jan	20,803	244	20,373	186	0	0	0	0	0	0	1,757	84.44
Feb	12,284	60	12,167	56	0	0	0	0	0	0	696	56.67
Mar	33,128	8	33,094	0	25	0	0	0	0	0	1,286	38.82
Apr	77,314	16	77,278	0	21	0	0	0	0	0	2,924	37.82
May	22,618	0	22,618	0	0	0	0	0	0	0	899	39.76
Jun	57,277	0	57,243	35	0	0	0	0	0	0	2,155	37.62
Jul	33,215	46	33,169	0	0	0	0	0	0	0	1,169	35.21
Aug	5,444	26	5,418	0	0	0	0	0	0	0	332	60.92
Sep	24,644	76	24,568	0	0	0	0	0	0	0	809	32.82
Oct	22,008	176	21,832	0	0	0	0	0	0	0	1,048	47.62
Nov	58,756	0	58,491	265	0	0	0	0	0	0	2,351	40.02
Dec	33,855	0	33,647	194	14	0	0	0	0	0	2,236	66.06
Totals	401,346	652	399,897	737	60	0	0	0	0	0	17,662	44.01

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-017

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 21-28. Please provide a schedule, by month, by facility, supporting how the 389 GWH of off-peak energy was sold and the average price received.

Response:
Please see the attached table for the requested information. In this analysis energy sales were met in the following order: ICUs, bilateral energy purchases, Newington/Wyman, Schiller 6, Schiller 4, Merrimack 1, Merrimack 2, Schiller 5 and other.

2009 Off-Peak

	Total ISO-NE Spot Sales MWh	Surplus Sales from ICU MWh	Surplus Sales from Bilateral MWh	Surplus Sales from Newington/Wyman MWh	Surplus Sales from SCH6 MWh	Surplus Sales from SCH 4 MWh	Surplus Sales from MK1 MWh	Surplus Sales from MK2 MWh	Surplus Sales from SCH 5 MWh	Surplus Sales from other MWh	Total ISO-NE Spot Sales $000	Avg Sale $/MWh
Jan	41,042	39	35,365	5,616	23	0	0	0	0	0	2,794	68.07
Feb	23,552	42	20,677	1,651	572	427	182	0	0	0	996	42.28
Mar	44,209	0	30,084	4	4,852	3,585	5,669	14	0	0	1,526	34.51
Apr	56,158	0	44,640	18	4,059	3,400	3,607	433	0	0	1,586	28.25
May	45,043	0	26,984	0	4,445	4,379	8,642	592	0	0	1,406	31.20
Jun	32,390	0	20,063	0	3,107	1,707	7,392	120	0	0	899	27.76
Jul	28,846	0	18,839	2	1,538	342	7,790	334	0	0	712	24.70
Aug	9,013	0	9,013	0	0	0	0	0	0	0	172	19.10
Sep	13,648	0	13,648	0	0	0	0	0	0	0	287	21.05
Oct	22,958	4	22,954	0	0	0	0	0	0	0	712	31.00
Nov	32,195	0	32,195	0	0	0	0	0	0	0	903	28.04
Dec	39,805	0	24,122	2,023	5,537	3,417	4,631	75	0	0	2,078	52.21
Totals	388,859	84	298,586	9,313	24,134	17,258	37,914	1,569	0	0	14,071	36.19

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-018

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Errichetti testimony, page 4, line 28. Please combine the results of the two previous requests to support the combined revenue of $31.8 million.

Response:
The table below provides the requested information. The difference between $31.8 million in the testimony and $31.7 million in the table is a result of rounding the on peak and off peak values to 1 decimal place before adding.

	Total ISO-NE Spot Sales MWh	Surplus Sales from Generation MWh	Surplus Sales from Bilateral MWh	Total ISO-NE Spot Sales ($000)	Average Sale $/MWh
Jan 09	61,845	6,107	55,738	4,550	73.58
Feb	35,835	2,991	32,844	1,692	47.21
Mar	77,337	14,159	63,178	2,812	36.36
Apr	133,472	11,554	121,918	4,510	33.79
May	67,661	18,059	49,602	2,305	34.07
Jun	89,667	12,362	77,305	3,054	34.06
Jul	62,062	10,053	52,009	1,882	30.32
Aug	14,457	26	14,431	504	34.85
Sep	38,292	76	38,216	1,096	28.62
Oct	44,966	180	44,786	1,760	39.14
Nov	90,951	265	90,686	3,254	35.78
Dec	73,660	15,891	57,769	4,315	58.57
Totals	790,205	91,722	698,483	31,733	40.16

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-019
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 25-26. Please explain and reconcile why the on-peak energy sales increased from 169 GWH in 2008 to 401 GWH in 2009. As part of your response, please include the impact of how the Merrimack–2 outage from August to December 2009 influenced on-peak energy sales.

Response:
On-peak energy sales occur in hours when generation committed to PSNH plus bilateral purchases exceed ES load. 2009 on-peak energy sales increased over 2008 primarily because ES loads decreased significantly due to the recession and migration while committed generation, but for the extended Merrimack 2 outage, was strong and even though bilateral purchases were reduced somewhat from 2008. Staff-01, Q-Staff-016 shows the breakdown of surplus energy sales between PSNH generation and bilateral energy purchases.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-020
Page 1 of 1

Witness:	**David A. Errichetti**
Request from:	**New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 4, lines 26-28. Please explain and reconcile why the off-peak energy sales increased from 145 GWH in 2008 to 389 GWH in 2009. As part of your response, please include the impact of how the Merrimack–2 outage from August to December 2009 influenced off-peak bilateral purchases.

Response:
Off-peak energy sales occur in hours when generation committed to PSNH plus bilateral purchases exceed ES load. 2009 off-peak energy sales increased over 2008 primarily because ES loads decreased significantly due to the recession and migration while committed generation, but for the extended Merrimack 2 outage, was strong and off peak bilateral energy sales were higher than 2008 in part to manage the Merrimack 2 extended outage. See Staff-01, Q-Staff-017 shows the breakdown of surplus energy sales between PSNH generation and bilateral energy purchases.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-021

Witness: David A. Errichetti, Robert A. Baumann
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Errichetti testimony, page 5, lines 10-13. Please take the months of January, February, November, and December of 2009 and calculate the total cost to customers on an average cents per kWh basis assuming that all PSNH resource energy supply was procured from the market at ISO-NE spot prices. As part of your response, please compare the resultant prices to the prices actually paid by PSNH customers. Also as part of your response, please convert customer savings to total dollars.

Response:
The following table provides the requested information. Nodal locational marginal prices, LMPs, were used so as to avoid needing to add to actual variable costs the congestion and loss price differentials that would need to be considered if New Hampshire Zone LMPs were used.

Cost and Savings If Own Generation Were Bought in Day Ahead Energy Market

	Own Generation	Variable Costs		Cost at DA LMPs		Savings from Own Generation	
	MWh	$000	¢/kWh	$000	¢/kWh	$000	¢/kWh
Jan-09	520,100	25,106	4.83	36,583	7.03	11,477	2.21
Feb-09	349,440	15,805	4.52	17,083	4.89	1,278	0.37
Nov-09	203,900	8,981	4.40	7,378	3.62	(1,603)	(0.79)
Dec-09	398,172	16,485	4.14	23,028	5.78	6,543	1.64
Four Months	1,471,612	66,377	4.51	84,072	5.71	17,695	1.20

Variable costs are sum of Fossil Energy costs and RGGI costs, lines 29 and 40 of Attachment RAB-3 page 1 of 2 and 2 of 2

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-022
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 6, lines 12-16. Please explain what PSNH is doing to maximize its claimed capacity as measured by the ISO-NE rules at all of its generating facilities by facility. Include in your response efficiency and other programs that would allow PSNH to claim maximum credit for their capacity.

Response:
PSNH fulfills ISO-NE capacity audit tests for both the summer and winter capacity demonstration. Each required unit conducts winter and summer tests to demonstrate continuous MW capability in each period. Values that each unit demonstrates are based on knowledge and experience of each unit's capability including limitations of equipment and systems. The objective in these tests is to seek to sustain prior values or increase them, even if by small amounts. Depending on where a unit is in its 5 or 6-year maintenance cycle, turbine efficiency is one example of a factor that could contribute to the rating.

It is an ongoing effort to sustain or pursue opportunities to improve the overall capacity value of each unit. Q-STAFF-59 identifies typical efficiency efforts made at the stations.

When a major project, like the MK2 HP/IP turbine replacement is completed, there is a net increase to the unit's capacity. In the case of MK2, the unit demonstrated a net energy increase of 12 MW due to equipment efficiency gains. An additional unit capability of just over 5 MW was also demonstrated, which further added capacity value for customers.

PSNH is continuously seeking cost effective ways to improve performance ratings or efficiency of its equipment, whether by repair or replacement. Every positive gain in this area helps customers.

Public Service Company of New Hampshire	**Data Request STAFF-01**
Docket No. DE 10-121	**Dated: 06/16/2010**
	Q-STAFF-023
	Page 1 of 2

Witness:	**David A. Errichetti**
Request from:	**New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 8, lines 1-6. Please individually list by month the FTR amounts procured for Merrimack, Schiller, and Newington stations, their cost, and the congestion savings realized.

Response:
Attached please find the requested information.

2009 FTR Activity and Valuation for Merrimack, Schiller and Newington

Source	Month	FTR MW Quantity On-Peak	FTR MW Quantity Off-Peak		Corresponding Cost and Value of FTRs: FTR Auction $	FTR Value $	Net FTR $
Merrimack	Jan - Dec	75	50				
	Jan	325	275		(39,354)	26,144	(13,211)
	Feb	325	309		(25,860)	(1,934)	(27,794)
	Mar	225	250		(20,569)	619	(19,950)
	Apr	225			(19,614)	135,405	115,791
	May	225	230		(15,650)	(2,776)	(18,426)
	Jun	225	150		(17,343)	5,480	(11,863)
	Jul	225	150		(19,739)	(591)	(20,330)
	Aug		25		(7,296)	214	(7,082)
	Sep	25	25		(7,604)	1,051	(6,553)
	Oct	25	25		(7,335)	2,223	(5,113)
	Nov	25	25		(7,292)	1,162	(6,130)
	Dec	275	207		(13,685)	(946)	(14,631)
				Total	(201,343)	166,051	(35,292)
Schiller	Jan - Dec						
	Jan	105	45		(8,955)	6,133	(2,822)
	Feb	105	75		(4,902)	5,402	500
	Mar	60	75		(3,845)	2,096	(1,749)
	Apr	40	30		(3,022)	1,637	(1,386)
	May	60	75		(1,836)	650	(1,187)
	Jun	60	75		(3,011)	1,788	(1,223)
	Jul	85	75		(3,211)	447	(2,763)
	Aug	55	25		(2,064)	(113)	(2,177)
	Sep	80	65		(1,139)	1,393	254
	Oct	80	65		(1,081)	(12,914)	(13,995)
	Nov	55	86		(1,874)	718	(1,156)
	Dec	120	100		(864)	(369)	(1,234)
				Total	(35,805)	6,869	(28,936)
Newington	Jan - Dec						
	Jan	150			(14,903)	8,397	(6,506)
	Feb	200			(12,816)	13,742	926
	Mar				0	0	0
	Apr				0	0	0
	May				0	0	0
	Jun				0	0	0
	Jul				0	0	0
	Aug				0	0	0
	Sep				0	0	0
	Oct				0	0	0
	Nov				0	0	0
	Dec				0	0	0
				Total	(27,719)	22,139	(5,580)
				Total Above	(264,866)	195,059	(69,807)

Notes:
Jan.-Dec. FTR cost and value 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 partial refund of under-funded target allocations via the ISO-NE Congestion Revenue Fund]

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-024

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Errichetti testimony, page 8, lines 12-15. Using information from the response to question 1-23, please demonstrate that the net FTR savings decreased the energy service expenses by $112,260.

Response:
As discussed in testimony, PSNH acquires FTRs for resources it expects to operate during the applicable period. Thus PSNH's strategy is to convert a variable congestion value into a fixed FTR auction value. Put another way, PSNH purchases FTRs primarily to provide cost certainty and thus reduce risk rather than to achieve savings. The variable congestion value is what PSNH avoided or gave up in exchange for having a fixed FTR auction value. The $112,260 is the difference between the fixed FTR auction value of the FTRs PSNH acquired and what the variable congestion value would have been. The table below builds on the information provided in Staff-01, Q-Staff-23 to show the derivation of the $112,260.

Derivation of 2009 FTR Net Value

Source	Month	FTR MW Quantity On-Peak	FTR MW Quantity Off-Peak		Coresponding Cost and Value of FTRs FTR Auction $	FTR Value $	Net FTR $
Total of Merrimack, Schiller & Newington					(264,866)	195,059	(69,807)
Other	Jan - Dec	150					
	Jan	28	28		23,630	3,304	26,934
	Feb	10	10		17,418	(17,715)	(297)
	Mar	10	10		19,242	(20,476)	(1,235)
	Apr	10	10		18,863	3,528	22,391
	May	10	10		19,625	(14,855)	4,770
	Jun	10	10		18,845	(5,550)	13,295
	Jul	60	10		22,669	(23,069)	(401)
	Aug	114	10		26,285	(2,985)	23,300
	Sep	60			23,204	4,725	27,928
	Oct	35	10		21,858	3,849	25,707
	Nov	43	18		23,644	(4,509)	19,135
	Dec	10	10		19,993	545	20,538
				Total	255,276	(73,209)	182,067
				Total All Above	(9,590)	121,850	112,260

Notes:

Other FTR MWs include those that were purchased to address bilateral and Vermont Yankee 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 partial refund of under-funded target allocations via the ISO-NE Congestion Revenue Fund]

Public Service Company of New Hampshire | **Data Request STAFF-01**
Docket No. DE 10-121 | **Dated: 06/16/2010**
Q-STAFF-025

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, page 8, lines 14-15. Please explain the factors that resulted in a difference in the FTR net cost of $590,153 in 2008 and the $112,260 net savings in 2009.

Response:
As noted in testimony and in Staff-01, Q-Staff-024, PSNH's FTR strategy is to convert a variable congestion value to a fixed FTR auction value by buying FTRs for a path starting from resources it expects to operate and ending at the NH load zone where PSNH ES load is priced. Put another way, PSNH purchases FTRs primarily to provide cost certainty and thus reduce risk rather than to achieve savings. The prices PSNH pays for FTRs is driven by market expectations, while the value of the FTRs are a function of how the energy markets perform. In 2008 the net variable congestion value of the FTRs acquired by PSNH was less than net fixed FTR auction value seen by PSNH through the FTR auctions. In 2009 the net variable congestion value was greater than the net fixed FTR auction value seen by PSNH through the FTR auctions.

The table below shows by the month the aggregate FTR valuation for 2009 and 2008 and how fixing exposure saved in 2009 and cost in 2008. PSNH continues to believe that purchasing FTRs to convert variable congestion exposure to fixed congestion exposure is desirable.

In hindsight numerous observations can be made about how pursuing FTRs turned out differently in 2009 than 2008. The FTR auction is the market's prediction of what FTRs are worth, including whether the path chosen will have positive or negative congestion. The FTR value is what turns out to be the case in actual. In a perfect world there would be little difference between the two, but in reality the two seldom match up. The most significant difference between 2008 and 2009 is that in 2008 a significant number of purchased FTRs' actual congestion flows were opposite to what the market expected in the auction. This effect can be seen in June 2008 where PSNH paid $160,173 and where under perfect conditions it should have received an equal amount in value it actually paid almost the same amount again because the FTR value reversed. May and July are examples of this not happening where FTRs are purchased in auction and then value is received in the month. This reversal of FTR value did not recur in a significant way 2009.

Cost and Value of FTRs

	2009				2008		
Month	FTR Auction $	FTR Value $	Net FTR $	Month	FTR Auction $	FTR Value $	Net FTR $
Jan	(39,582)	43,978	4,396	Jan	(92,803)	(9,389)	(102,192)
Feb	(26,161)	(505)	(26,665)	Feb	(55,695)	20,523	(35,172)
Mar	(5,173)	(17,761)	(22,934)	Mar	(44,076)	6,057	(38,019)
Apr	(3,773)	140,570	136,797	Apr	3,553	(12,871)	(9,318)
May	2,138	(16,981)	(14,843)	May	(20,405)	108,089	87,685
Jun	(1,510)	1,719	209	Jun	(160,173)	(140,781)	(300,954)
Jul	(281)	(23,213)	(23,494)	Jul	(156,914)	219,298	62,384
Aug	16,925	(2,884)	14,041	Aug	(163,006)	11,895	(151,111)
Sep	14,460	7,169	21,629	Sep	(62,923)	13,558	(49,365)
Oct	13,442	(6,843)	6,599	Oct	13,777	(30,654)	(16,877)
Nov	14,479	(2,630)	11,850	Nov	(46,805)	44,852	(1,953)
Dec	5,443	(770)	4,673	Dec	(41,657)	6,396	(35,261)
Total	(9,590)	121,850	112,260	Total	(827,127)	236,974	(590,153)

Notes

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 partial refund of under-funded target allocations via the ISO-NE Congestion Revenue Fund]

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-026

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, Attachment DAE-1. Please explain why the capacity values for Bethlehem, Tamworth, Lempster Wind, and Hydro Quebec are not included in this attachment. Please provide the respective capacity values for those units/entitlements.

Response:
Attachment DAE-1 shows the current ratings of resources available to meet PSNH's ES energy needs. The various resources identified were excluded from Attachment DAE-1 for the following reasons.

- In 2009 Bethlehem and Tamworth were being purchased under short-term unit contingent purchase arrangements. As such they were viewed as bilateral arrangements not IPPs and not unlike bilateral energy strips. Since bilateral energy strips are not included in Attachment DAE-1, Bethlehem and Tamworth were also excluded.
- While Lempster Wind is a long-term arrangement and available to meet PSNH's ES energy needs, it was excluded primarily because its rating is not indicative of its energy contribution and thus its inclusion would have distorted the MW tally.
- PSNH receives a proportionate share of Hydro Quebec Interconnection Capacity Credits but no energy. Since, as noted above, Attachment DAE-1 is intended to identify energy resources, Hydro Quebec is excluded.

The capacity credits for these resources are provided in response to Staff-01, Q-STAFF-028.

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, Attachments DAE-1 and DAE-2. Please provide, by month, for on-peak, off-peak, and total values and in the form provided in previous dockets:

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

Response:
The attached file provides the requested information consistent with the Supplemental Testimony of David A. Errichetti which reflects total bilateral supplemental energy purchases, not just those that served ES load as was reflected in his original testimony:

Q27-a bilateral and spot market purchase and sale details.
Q27-b compares actual 2009 bilateral and spot market purchase quantities with the forecasted quantities in the December 2008 rate request filing. Includes data and two charts.
Q27-c breaks total supplemental purchase quantities into "monthly bilateral", "short-term bilateral" (i.e. less than one month), and "spot market".
Q27-d breaks total surplus sale quantities into surplus generation vs surplus bilateral purchases.

[Q-27a] Summary of 2009 PSNH Bilateral Purchases and ISO-NE Spot Purchases & Sales

Peak

	Total Bilateral Purchases MWh	Total Bilateral Purchases $000	Avg 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	Avg Price $/MWh
Jan	87,517	11,511	131.53	20,373	23%	(1,112)	14,391	1,030	71.57
Feb	95,687	11,178	116.82	12,167	13%	(818)	20,979	1,101	52.49
Mar	95,002	10,327	108.70	33,094	35%	(2,314)	2,464	194	78.88
Apr	150,593	14,738	97.86	77,278	51%	(4,645)	3,288	154	46.80
May	90,210	9,816	108.81	22,618	25%	(1,566)	12,668	537	42.40
Jun	138,106	14,495	104.96	57,243	41%	(3,925)	1,388	61	43.99
Jul	127,905	13,652	106.74	33,169	26%	(2,447)	10,713	445	41.50
Aug	176,438	15,341	86.95	5,418	3%	(144)	31,925	1,531	47.94
Sep	196,529	17,224	87.64	24,568	13%	(1,373)	811	37	45.34
Oct	170,665	14,548	85.25	21,832	13%	(866)	4,442	193	43.38
Nov	154,908	13,209	85.27	58,491	38%	(2,629)	1,317	74	56.33
Dec	105,372	11,110	105.44	33,647	32%	(1,435)	9,800	569	58.06
Totals	1,588,933	157,148	98.90	399,897	25%	(23,274)	114,185	5,925	51.89

Off-Peak

	Total Bilateral Purchases MWh	Total Bilateral Purchases $000	Avg 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	Avg Price $/MWh
Jan	71,622	7,059	98.55	35,365	49%	(1,131)	6,779	460	67.87
Feb	72,161	6,900	95.62	20,677	29%	(1,258)	21,616	1,028	47.54
Mar	50,318	4,974	98.86	30,084	60%	(1,993)	2,840	163	57.33
Apr	77,989	7,332	94.01	44,640	57%	(2,899)	7,730	291	37.62
May	52,032	5,122	98.43	26,984	52%	(2,007)	11,831	455	38.49
Jun	53,699	4,626	86.14	20,063	37%	(1,452)	6,054	193	31.91
Jul	44,909	4,402	98.02	18,839	42%	(1,472)	10,946	354	32.34
Aug	145,598	10,200	70.06	9,013	6%	(419)	35,841	1,408	39.29
Sep	124,002	8,612	69.45	13,648	11%	(587)	12,057	367	30.41
Oct	126,215	7,916	62.72	22,954	18%	(732)	8,618	354	41.04
Nov	128,616	8,084	62.85	32,195	25%	(1,121)	5,320	256	48.19
Dec	47,205	4,455	94.37	24,122	51%	(1,058)	15,279	696	45.56
Totals	994,365	79,682	80.13	298,586	30%	(16,129)	144,914	6,025	41.58

Total

	Total Bilateral Purchases MWh	Total Bilateral Purchases $000	Avg 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	Avg Price $/MWh
Jan	159,138	18,569	116.69	55,738	35%	(2,243)	21,170	1,490	70.38
Feb	167,848	18,078	107.70	32,844	20%	(2,076)	42,595	2,129	49.98
Mar	145,320	15,301	105.29	63,178	43%	(4,307)	5,304	357	67.34
Apr	228,582	22,070	96.55	121,918	53%	(7,544)	11,018	445	40.36
May	142,241	14,937	105.01	49,602	35%	(3,573)	24,500	993	40.51
Jun	191,806	19,121	99.69	77,305	40%	(5,377)	7,442	254	34.16
Jul	172,814	18,054	104.47	52,009	30%	(3,919)	21,659	799	36.87
Aug	322,036	25,541	79.31	14,431	4%	(563)	67,766	2,939	43.37
Sep	320,532	25,836	80.60	38,216	12%	(1,959)	12,868	403	31.35
Oct	296,880	22,464	75.67	44,786	15%	(1,598)	13,060	546	41.83
Nov	283,524	21,293	75.10	90,686	32%	(3,750)	6,638	331	49.8[illegible]
Dec	152,578	15,565	102.02	57,769	38%	(2,494)	25,079	1,265	50.45
Totals	2,583,299	236,830	91.68	698,483	27%	(39,404)	259,099	11,950	46.12

[Q-27b]

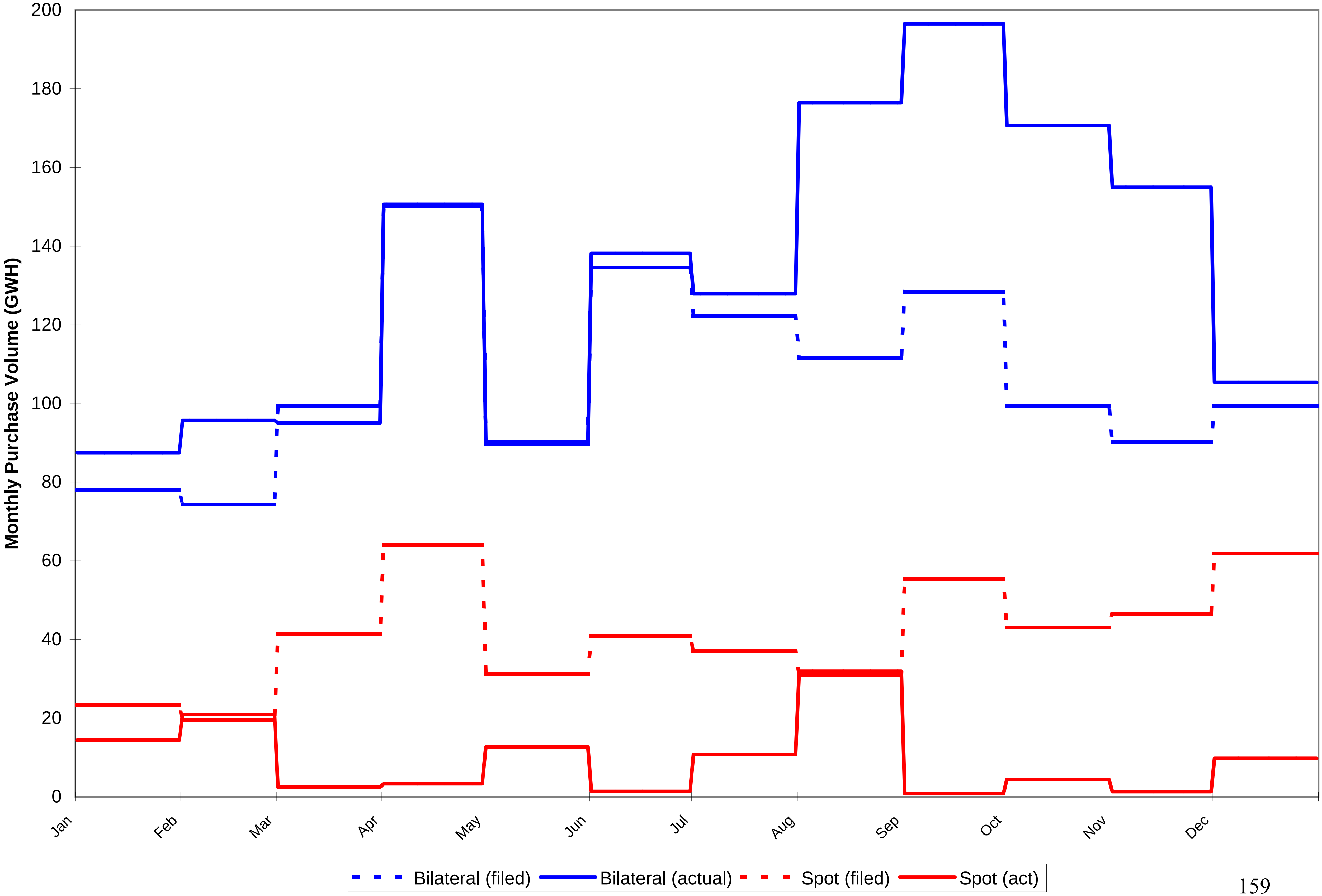
Peak

	Actual 2009 Purchase Quantities		Purchase Quantities Filed with Rate Request	
	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh
1	87,517	14,391	78,019	23,460
2	95,687	20,979	74,304	19,441
3	95,002	2,464	99,334	41,360
4	150,593	3,288	150,074	63,950
5	90,210	12,668	89,789	31,187
6	138,106	1,388	134,534	40,908
7	127,905	10,713	122,250	37,110
8	176,438	31,925	111,619	31,013
9	196,529	811	128,419	55,448
10	170,665	4,442	99,334	43,021
11	154,908	1,317	90,304	46,524
12	105,372	9,800	99,334	61,832
Totals	1,588,933	114,185	1,277,315	495,254

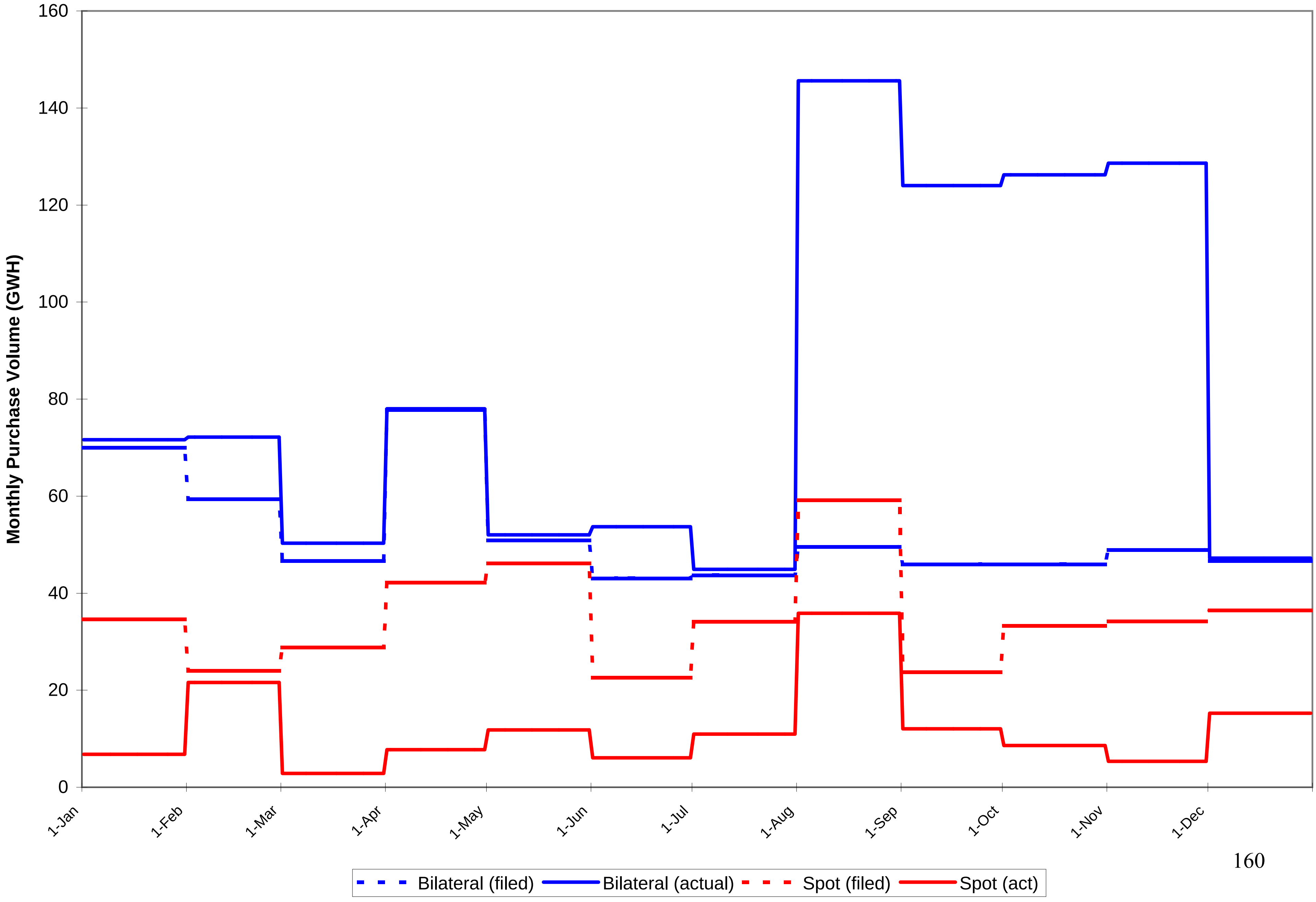
Off-Peak

	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh	Total Bilateral Purchases MWh	Total ISO-NE Spot Purchases MWh
1	71,622	6,779	69,938	34,600
2	72,161	21,616	59,334	23,984
3	50,318	2,840	46,622	28,788
4	77,989	7,730	77,715	42,148
5	52,032	11,831	50,870	46,119
6	53,699	6,054	43,050	22,570
7	44,909	10,946	43,707	34,132
8	145,598	35,841	49,538	59,112
9	124,002	12,057	45,965	23,741
10	126,215	8,618	45,960	33,255
11	128,616	5,320	48,880	34,176
12	47,205	15,279	46,622	36,442
Totals	994,365	144,914	628,202	419,067

2009 On-Peak Bilateral and Spot Purchase Activity (Actual vs Originally Filed)



2009 Off-Peak Bilateral and Spot Purchase Activity (Actual vs Originally Filed)



Q-27c	On-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-04	54,506	92%	0%	8%	13,455	0%	0%	100%
Feb-04	66,872	72%	11%	17%	23,539	0%	0%	100%
Mar-04	141,420	78%	8%	14%	63,115	0%	28%	72%
Apr-04	107,401	98%	0%	2%	49,482	0%	3%	97%
May-04	56,608	0%	42%	58%	23,996	0%	13%	87%
Jun-04	53,239	0%	8%	92%	25,283	0%	19%	81%
Jul-04	89,903	75%	12%	14%	27,426	0%	0%	100%
Aug-04	96,156	73%	12%	15%	39,364	0%	24%	76%
Sep-04	44,180	38%	13%	49%	32,448	0%	79%	21%
Oct-04	139,256	0%	78%	22%	78,562	0%	57%	43%
Nov-04	13,097	0%	18%	82%	40,255	0%	83%	17%
Dec-04	37,819	0%	36%	64%	13,814	0%	12%	88%
Jan-05	77,635	65%	24%	11%	20,082	0%	14%	86%
Feb-05	58,386	44%	32%	25%	25,207	0%	44%	56%
Mar-05	150,227	93%	6%	1%	67,053	85%	0%	15%
Apr-05	100,550	92%	0%	8%	58,987	94%	0%	7%
May-05	191,362	98%	0%	2%	141,334	91%	0%	9%
Jun-05	168,685	89%	2%	9%	105,184	81%	3%	16%
Jul-05	93,220	69%	2%	30%	54,264	68%	6%	26%
Aug-05	109,491	67%	1%	32%	47,339	48%	0%	52%
Sep-05	146,184	83%	2%	16%	71,578	90%	0%	10%
Oct-05	148,895	81%	4%	15%	112,187	78%	1%	21%
Nov-05	111,916	90%	0%	10%	65,306	94%	0%	6%
Dec-05	67,592	87%	0%	13%	78,757	92%	0%	8%
Jan-06	57,045	94%	0%	6%	57,578	81%	0%	19%
Feb-06	130,771	37%	58%	5%	79,510	0%	58%	42%
Mar-06	147,864	100%	0%	0.4%	47,472	81%	0%	19%
Apr-06	176,562	100%	0%	0.3%	126,109	95%	0%	5%
May-06	221,370	95%	1%	4%	129,261	68%	3%	29%
Jun-06	156,009	90%	5%	5%	75,531	91%	0%	9%
Jul-06	121,246	53%	30%	17%	121,614	88%	7%	5%
Aug-06	149,314	49%	28%	23%	92,702	95%	0%	5%
Sep-06	187,516	94%	4%	2%	104,375	57%	8%	35%
Oct-06	158,657	100%	0%	0.2%	70,868	96%	0%	4%
Nov-06	151,615	100%	0%	0.3%	87,183	99%	0%	1%
Dec-06	157,354	92%	4%	5%	114,077	87%	0%	13%
Jan-07	73,910	55%	23%	22.3%	75,638	90%	0%	10%
Feb-07	50,642	73%	11%	16.0%	70,540	87%	5%	9%
Mar-07	115,478	66%	26%	8.7%	58,315	81%	0%	19%
Apr-07	157,269	88%	1%	10.5%	78,215	59%	4%	37%
May-07	194,826	75%	6%	19.1%	112,347	76%	0%	24%
Jun-07	148,246	83%	9%	8.1%	72,858	64%	9%	27%
Jul-07	181,284	77%	14%	8.9%	89,081	79%	0%	21%
Aug-07	193,398	89%	2%	9.4%	92,606	67%	14%	19%
Sep-07	152,442	73%	17%	10.3%	103,988	51%	22%	27%
Oct-07	133,175	73%	10%	16.4%	57,284	75%	0%	25%
Nov-07	107,760	83%	0%	17.3%	54,579	86%	0%	14%
Dec-07	133,305	88%	0%	12.3%	79,321	68%	0%	32%
Jan-08	148,687	63%	24%	13.5%	71,454	56%	1%	43%
Feb-08	134,171	79%	6%	15.1%	75,806	47%	13%	40%
Mar-08	146,361	83%	10%	7.5%	78,824	71%	3%	26%
Apr-08	238,479	100%	0%	0.4%	150,309	84%	0%	16%
May-08	214,361	99%	0%	0.8%	153,132	95%	0%	5%
Jun-08	201,567	81%	14%	5.0%	118,042	50%	15%	35%
Jul-08	215,916	71%	13%	16.8%	151,912	39%	16%	44%
Aug-08	164,809	88%	2%	10.0%	84,180	78%	0%	22%
Sep-08	180,327	81%	0%	19.4%	111,527	42%	0%	58%
Oct-08	157,982	66%	0%	33.9%	78,611	56%	0%	44%
Nov-08	121,363	70%	8%	21.6%	74,481	68%	0%	32%
Dec-08	122,458	80%	3%	16.3%	62,054	73%	0%	27%
Jan-09	101,908	76%	9%	14.1%	78,400	89%	2%	9%
Feb-09	116,667	61%	21%	18.0%	93,777	68%	9%	23%
Mar-09	97,466	97%	0%	2.5%	53,158	95%	0%	5%
Apr-09	153,880	98%	0%	2.1%	85,719	91%	0%	9%
May-09	102,878	88%	0%	12.3%	63,863	81%	0%	19%
Jun-09	139,494	97%	2%	1.0%	59,754	74%	16%	10%
Jul-09	138,618	89%	3%	7.7%	55,855	80%	0%	20%
Aug-09	208,363	82%	2%	15.3%	181,439	78%	3%	20%
Sep-09	197,340	100%	0%	0.4%	136,060	91%	0%	9%
Oct-09	175,107	97%	0%	2.5%	134,834	94%	0%	6%
Nov-09	156,225	99%	0%	0.8%	133,936	96%	0%	4%
Dec-09	115,172	87%	5%	8.5%	62,484	76%	0%	24%

2004	900,457	52%	22%	26%	430,738	0%	33%	67%
2005	1,424,144	83%	4%	13%	847,280	79%	3%	18%
2006	1,815,322	85%	10%	5%	1,106,280	79%	6%	15%
2007	1,641,733	78%	9%	13%	944,774	73%	5%	22%

[Q-27d]

2009 On-Peak

	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	20,803	430	20,373	1,757	84.44
Feb	12,284	116	12,167	696	56.67
Mar	33,128	34	33,094	1,286	38.82
Apr	77,314	36	77,278	2,924	37.82
May	22,618	0	22,618	899	39.76
Jun	57,277	35	57,243	2,155	37.62
Jul	33,215	46	33,169	1,169	35.21
Aug	5,444	26	5,418	332	60.92
Sep	24,644	76	24,568	809	32.82
Oct	22,008	176	21,832	1,048	47.62
Nov	58,756	265	58,491	2,351	40.02
Dec	33,855	208	33,647	2,236	66.06
Totals	401,346	1,449	399,897	17,662	44.01

2009 Off-Peak

	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	41,042	5,677	35,365	2,794	68.07
Feb	23,552	2,874	20,677	996	42.28
Mar	44,209	14,125	30,084	1,526	34.51
Apr	56,158	11,517	44,640	1,586	28.25
May	45,043	18,059	26,984	1,406	31.20
Jun	32,390	12,327	20,063	899	27.76
Jul	28,846	10,007	18,839	712	24.70
Aug	9,013	0	9,013	172	19.10
Sep	13,648	0	13,648	287	21.05
Oct	22,958	4	22,954	712	31.00
Nov	32,195	0	32,195	903	28.04
Dec	39,805	15,683	24,122	2,078	52.21
Totals	388,859	90,274	298,586	14,071	36.19

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-028
Page 1 of 2

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Errichetti testimony, Attachment DAE-5. Please break down PSNH MW capacity resources by month and by facility reconciling the figures stated in the table.

Response:
Please see the attached table for the requested information

PSNH Capacity Resources' Capacity Values by Resource by Month (MW)

Unit	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Period
AMOSKEAG	17.50	17.50	17.50	17.50	17.50	17.43	17.43	17.43	17.43	17.37	17.37	17.37	209.33
ASHUELOT HYDRO	0.75	0.74	0.87	0.87	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.10
AVERY DAM	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.43	0.36	0.44	0.45	0.45	5.28
AYERS ISLAND	9.08	9.08	9.08	9.08	9.08	8.74	8.74	8.74	8.74	8.72	8.72	8.72	106.52
BATH ELECTRIC HYDRO	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.35	0.38	0.38	0.37	0.37	4.51
BELL MILL/ELM ST. HYDRO	0.07	0.07	0.07	0.07	0.07	0.05	0.02	0.03	0.05	0.07	0.07	0.07	0.71
BETHLEHEM	14.47	14.47	14.55	14.64	14.97	15.09	15.12	15.13	15.22	15.17	15.11	15.23	179.17
BRIAR HYDRO	2.91	3.54	4.69	4.69	4.69	2.69	1.25	0.81	0.75	1.29	3.81	4.66	35.78
CAMPTON DAM	0.06	0.07	0.15	0.44	0.44	0.18	0.09	0.07	0.08	0.13	0.18	0.13	2.02
CANAAN	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	13.20
CELLEY MILL U5	0.04	0.03	0.06	0.13	0.13	0.09	0.06	0.05	0.05	0.07	0.09	0.06	0.86
CHAMBERLAIN FALLS	0.08	0.11	0.12	0.12	0.12	0.07	0.03	0.03	0.04	0.06	0.09	0.09	0.96
CHINA MILLS DAM	0.45	0.50	0.84	0.84	0.69	0.29	0.12	0.07	0.11	0.23	0.53	0.67	5.34
CLEMENT DAM	2.20	2.14	2.25	2.25	2.25	1.74	1.23	1.04	0.69	1.02	1.62	2.07	20.50
COCHECO FALLS	0.34	0.29	0.55	0.66	0.43	0.23	0.12	0.10	0.16	0.34	0.40	0.40	4.02
DUNBARTON ROAD LANDFILL	0.51	0.51	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.44	0.44	5.50
EASTMAN BROOK U5	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	1.08
EASTMAN FALLS	6.46	6.46	6.46	6.46	6.46	6.47	6.47	6.47	6.47	6.47	6.47	6.47	77.59
ERROL	2.82	2.82	2.82	2.82	2.82	2.82	2.56	2.39	2.46	2.82	2.80	2.80	32.75
FISKE HYDRO	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	9.12
FOUR HILLS LANDFILL	0.35	0.35	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.80
FOUR HILLS LOAD REDUCER	0.94	0.94	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.41	1.41	16.22
FRANKLIN FALLS	0.75	0.75	0.75	0.75	0.75	0.75	0.63	0.53	0.35	0.52	0.75	0.75	8.03
FRESHWATER HYDRO	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	2.28
GARVINS/HOOKSETT	13.91	13.91	13.91	13.91	13.91	13.98	13.98	13.98	13.59	13.98	13.98	13.98	167.02
GOODRICH FALLS	0.06	0.00	0.09	0.32	0.31	0.16	0.09	0.08	0.07	0.11	0.14	0.09	1.52
GORHAM	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.03	2.03	2.03	24.27
GREAT FALLS LOWER	0.89	0.78	1.03	1.03	1.03	0.61	0.32	0.26	0.43	0.90	1.03	1.03	9.34
GREAT FALLS UPPER	1.85	1.62	1.95	1.95	1.95	1.26	0.67	0.53	0.88	1.85	1.93	1.93	18.37
GREGGS	1.41	1.66	3.10	3.10	2.57	1.07	0.46	0.28	0.24	0.92	1.77	2.11	18.69
HADLEY FALLS	0.23	0.23	0.23	0.23	0.23	0.20	0.08	0.05	0.04	0.17	0.23	0.23	2.15
HILLSBORO MILLS	0.44	0.43	0.53	0.53	0.53	0.44	0.26	0.22	0.18	0.33	0.53	0.53	4.95
HOSIERY MILL DAM	0.68	0.99	1.17	1.17	1.17	0.82	0.34	0.29	0.35	0.52	0.93	0.99	9.42
HQ ICC	-0.38	-0.38	128.86	128.86	128.86	128.86	128.86	128.86	128.86	128.86	128.86	0.00	1,158.98
INDECK ALEXANDRIA	0.00	12.96	12.96	12.96	12.96	11.78	11.78	11.78	11.78	8.11	8.11	8.11	123.29
JACKMAN	3.40	3.40	3.40	3.40	2.32	2.36	2.36	2.36	2.36	2.36	2.36	2.36	32.44
KELLEYS FALLS	0.38	0.38	0.38	0.38	0.38	0.31	0.13	0.08	0.00	0.26	0.37	0.37	3.42
LAKEPORT DAM	0.67	0.66	0.61	0.68	0.68	0.47	0.35	0.28	0.23	0.28	0.48	0.60	5.99
LEMPSTER WIND	22.06	9.33	9.43	9.29	9.26	9.01	8.55	8.21	7.67	7.33	7.25	7.16	114.55
LISBON HYDRO	0.26	0.25	0.63	0.75	0.75	0.51	0.23	0.18	0.19	0.35	0.48	0.36	4.94
LOCHMERE DAM	0.96	0.96	0.96	0.96	0.96	0.81	0.57	0.48	0.32	0.48	0.75	0.96	9.17
LOST NATION	18.08	18.08	18.08	18.08	18.08	14.07	14.07	14.07	14.07	18.08	18.08	18.08	200.92
LOWER ROBERTSON DAM	0.75	0.74	0.84	0.84	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01
MERRIMACK 1	110.45	110.45	110.45	110.45	110.45	107.75	107.75	107.75	107.75	112.60	112.60	112.60	1,321.05
MERRIMACK 2	306.65	306.65	306.65	306.65	306.65	307.90	307.90	307.90	307.90	308.26	308.26	308.26	3,689.63
MERRIMACK CT1	21.13	21.13	21.13	21.13	21.13	16.42	16.42	16.42	16.42	21.68	21.68	21.68	236.37
MERRIMACK CT2	21.27	21.27	21.27	21.27	21.27	16.75	16.75	16.75	16.75	19.00	19.00	19.00	230.35
MIDDLETON BUILDING SUPPLY	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
MILTON MILLS HYDRO	1.34	1.17	1.42	1.42	1.42	0.90	0.45	0.34	0.61	1.34	1.41	1.41	13.23
MINE FALLS	1.68	1.93	2.82	2.82	2.23	1.53	0.00	0.00	0.00	0.97	1.55	1.92	17.45
MONADNOCK PAPER MILLS	0.88	1.01	1.83	1.83	1.74	0.80	0.36	0.28	0.29	0.44	1.04	1.38	11.88
NASHUA HYDRO	0.79	0.79	0.79	0.79	0.79	0.78	0.34	0.34	0.27	0.50	0.78	0.78	7.74
NEWFOUND HYDRO	1.22	1.30	1.18	1.31	1.28	1.18	0.66	0.87	0.63	0.91	1.18	1.22	12.94
NEWINGTON 1	385.95	385.95	385.95	385.95	385.95	397.46	397.46	397.46	397.46	388.81	388.81	388.81	4,686.02
NOONE FALLS	0.11	0.12	0.14	0.14	0.14	0.14	0.06	0.04	0.04	0.06	0.14	0.14	1.27
OLD NASH DAM	0.13	0.12	0.16	0.16	0.16	0.11	0.05	0.03	0.03	0.12	0.16	0.16	1.39
OTIS MILL HYDRO	0.09	0.09	0.16	0.19	0.11	0.05	0.00	0.00	0.05	0.07	0.12	0.11	1.04
OTTER LANE HYDRO	0.08	0.08	0.08	0.08	0.08	0.08	0.04	0.04	0.03	0.08	0.08	0.08	0.83
PEMBROKE	0.92	1.02	1.80	2.44	1.42	0.00	0.00	0.00	0.00	0.00	1.10	1.39	10.09
PENNACOOK FALLS LOWER	2.81	3.40	4.33	4.33	4.33	2.69	1.28	0.87	0.82	1.40	3.72	4.30	34.28
PENNACOOK FALLS UPPER	2.20	2.65	3.38	3.38	3.38	2.11	1.00	0.68	0.64	1.10	2.91	3.36	26.79
PETERBOROUGH LOWER HYDRO	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.26	0.26	3.22
PETERBOROUGH UPPER HYDRO	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.37	0.37	4.54
RIVER BEND	1.68	1.68	1.68	1.68	1.68	1.65	1.10	0.91	0.53	0.89	1.53	1.67	16.68
ROLLINSFORD HYDRO	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.40	1.40	16.90
SALMON BROOK STATION 3	0.23	0.23	0.23	0.23	0.23	0.21	0.08	0.00	0.09	0.18	0.23	0.23	2.17
SALMON FALLS HYDRO	0.64	0.57	1.07	1.13	0.83	0.44	0.23	0.18	0.31	0.65	0.77	0.78	7.60
SCHILLER 4	46.90	46.90	46.90	46.90	46.90	46.05	46.05	46.05	46.05	46.65	46.65	46.65	558.65
SCHILLER 5	43.37	43.37	43.37	43.37	43.37	38.99	38.99	38.99	38.99	41.58	41.58	41.58	497.55
SCHILLER 6	47.89	47.89	47.89	47.89	47.89	46.97	46.97	46.97	46.97	44.16	44.16	44.16	559.81
SCHILLER CT 1	17.95	17.95	17.95	17.95	17.95	17.12	17.12	17.12	17.12	18.94	18.94	18.94	215.05
SES CONCORD	12.76	12.76	12.76	12.76	12.66	12.32	12.34	12.36	12.38	12.63	12.56	12.46	150.75
SMITH	16.07	16.49	17.60	17.60	17.60	17.60	13.89	12.77	13.06	14.36	16.67	16.19	189.90
STEELS POND HYDRO	0.62	0.65	0.89	0.92	0.92	0.49	0.17	0.14	0.18	0.55	0.91	0.91	7.35
STEVENS MILL	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	2.52
SUGAR RIVER HYDRO	0.14	0.14	0.14	0.14	0.14	0.14	0.08	0.06	0.05	0.12	0.14	0.14	1.43
SUNAPEE HYDRO	0.31	0.32	0.61	0.61	0.55	0.29	0.15	0.12	0.10	0.25	0.40	0.37	4.08
SUNNYBROOK HYDRO 1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.12
SUNNYBROOK HYDRO 2	0.04	0.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.57
SWANS FALLS	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	4.56
TAMWORTH	17.11	15.89	15.70	15.43	15.37	16.49	16.62	16.87	16.31	16.27	17.84	17.97	197.87
TURNKEY LANDFILL	2.91	2.91	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.79	2.79	33.88
VERMONT YANKEE	19.56	19.56	19.56	19.56	19.56	18.78	18.78	18.78	18.78	20.77	20.77	20.77	235.23
WATERLOOM FALLS	0.06	0.06	0.11	0.11	0.08	0.03	0.00	0.00	0.04	0.05	0.08	0.08	0.70
WATSON DAM	0.23	0.23	0.23	0.23	0.23	0.19	0.10	0.08	0.14	0.23	0.23	0.23	2.35
WAUSAU COGEN U5	0.38	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76
WEST HOPKINTON HYDRO	1.01	1.17	1.17	1.17	1.17	1.17	0.51	0.43	0.52	0.78	1.17	1.17	11.44
WESTON DAM	0.33	0.29	0.49	0.49	0.49	0.49	0.29	0.25	0.25	0.39	0.49	0.42	4.67
WHEELABRATOR CLAREMONT U5	4.59	4.59	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.93	3.93	48.72
WHITE LAKE JET	22.40	22.40	22.40	22.40	22.40	17.45	17.45	17.45	17.45	22.40	22.40	22.40	249.00
WYANDOTTE HYDRO	0.14	0.14	0.14	0.14	0.14	0.11	0.06	0.05	0.08	0.14	0.14	0.14	1.42
YARMOUTH 4	17.30	17.30	17.30	17.30	17.30	18.76	18.76	18.76	18.76	19.03	19.03	19.03	218.63
TOTAL	1,265.68	1,267.33	1,407.12	1,408.58	1,404.52	1,372.22	1,353.70	1,349.41	1,348.09	1,374.00	1,392.87	1,267.62	16,211.14

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Please supply a breakdown in terms of FTE's of the various functions at the NU Regulated Wholesale Power Contracts department showing which positions PSNH is financially responsible for. If the response is different than in previous years, please show the differences and explain the reasons for the changes.

Response:
The table below compares what was reported for 2008 with what was recorded for productive hours in 2009. The drop in total FTEs reflects one open FTE during part of 2009. The open position was filled in January 2010; therefore, the number of FTE's is back to 16 in 2010.

Wholesale Power Contracts Work Ditribution

	2008			2009		
	Total FTEs	PSNH	Other	Total FTEs	PSNH	Other
Bidding & Scheduling	2.00	1.75	0.25	2.00	1.99	0.01
Resource Planning / Analysis	4.00	2.00	2.00	3.25	1.45	1.9
Energy & Capacity Purchasing	2.00	0.50	1.50	2.00	0.74	1.26
Standard Offer & Default Service Procurement	3.00	0.00	3.00	3.00	0	2.93
Contract Administration	3.00	0.00	3.00	3.00	0	2.96
Administrative Support	1.00	0.25	0.75	1.00	0.33	0.67
Management	1.00	0.25	0.75	1.00	0.11	0.89
Total	16.00	4.75	11.25	15.25	4.62	10.62

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-030
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
In reference to the response to question 1-29, please specifically identify to which companies and business segments Mr. Errichetti’s time was allocated during 2009.

Response:
36% of Mr. Errichetti's productive time was booked to the PSNH generation segment with the vast majority of the remaining time booked to the Connecticut Light and Power Company.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-031

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference STAFF-01, Q-STAFF-026 from Docket DE 09-091. Please specifically identify to which companies and business segments Mr. Labrecque's time was allocated for 2008 and, to the extent applicable, for 2009. As part of the response, please explain any differences in the time allocations between Mr. Errichetti and Mr. Labrecque.

Response:
In 2008 Mr. Labrecque spent 94% of his time on PSNH matters. While with Wholesale Power Contracts in 2009, he spent 76% percent of his time on PSNH work. In addition, after leaving Wholesale Power Contracts, Mr. Labrecque kept responsibility for forecasting and managing PSNH's ES renewable portfolio standard requirements, retained responsibility for Wholesale Power Contract's involvement in the 2008 Stranded Cost Reconciliation process, and provided consulting services to Wholesale Power Contracts. Mr. Errichetti spent 18% of his time in 2008 on PSNH matters and 36% of his time on PSNH matters in 2009. While Mr. Errichetti increased his direct involvement in PSNH matters in 2009, as evident in response to Staff-01, Q-Staff-029 other persons in Wholesale Power Contracts also shifted their efforts such that while total FTEs dropped 0.75, FTEs on PSNH matters dropped 0.13.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-032
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. Please provide and describe separately PSNH's efforts to mitigate customer costs related to outages MK-2-E, Newington 1-C, and Newington 1-D. As part of your response, please quantify the financial results of your efforts.

Response:
As a result of negotiations with Siemens on various contracts associated with the Merrimack HP/IP replacement and repair project, as well as the Newington exciter replacement, PSNH pursued various efforts to gain value for customers. Rather than negotiating individual items to provide value to customers, which would have produced multiple smaller credits on multiple contracts for work at both stations, PSNH and Siemens were able to reach a global agreement on a smaller number of key items that provided significant value in the form of lower cost. These negotiations resulted in a benefit to customers through reduced costs that reduced the Energy Service rate.

Value was obtained from Siemens Power Corporation as follows:

- For the MK 2 Mobile Exciter, PSNH negotiated reduced rental payments from October 2008 to April 2009 totaling $784,000 .

- PSNH negotiated the continuation of the 10 year warranty on the refurbished HP/IP turbine equivalent to what was to be provided on the originally installed, new HP/IP turbine. The continuation of this equivalent warranty was achieved at no additional cost. The value is subjective, but could be worth millions due to the high costs to companies for managing large risks.

- PSNH negotiated the reinstatement of the performance guarantees on the refurbished HP/IP turbine equivalent to those in place on the originally installed equipment. Again the value is subjective, but is worth many millions over the life of the equipment.

- PSNH retained performance payment to Siemens until actual demonstration was made. The payments to be made for demonstration of performance guarantees were requested by Siemens upon obtaining initial performance data on initial start-up in May 2008. PSNH insisted on retention of these funds totaling over $7 Million, until actual demonstration was achieved in December 2009. Customers benefited by a 19 month delay in this payment without any interest fees. The value of this could approach $1 million.

While it is not possible to specifically quantify the financial impact of the above, PSNH estimates that the value could be as much as $10 million.

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. Please provide a copy of the PSNH evaluation regarding the need for isophase bus duct heaters at Merrimack and Schiller stations.

Response:
Merrimack and Schiller Stations have completed an evaluation of their bus duct configurations as recommended. Attached is a copy of the evaluation completed by PSNH regarding the need for bus duct heaters at Merrimack and Schiller Stations.

Interoffice Memorandum

To: Lynn Tillotson – Technical Business Manager

From: Dave Cribbie – Associate Engineer

Subject: Bus Duct Heater Evaluation at MK and SR

Cc: File 2009 – PUC Recommendation #2 Response
PUC Order 25060 (12/31/09)

PUC - Recommendation:

This second recommendation relates to the iso-phase bus duct failure at Wyman-4 due to malfunctioning heaters. Merrimack and Schiller stations do not have heaters in their iso-phase bus ducts due to their initial base load design and operation. Liberty recommends that due to shifting market conditions that can change the operation of both Merrimack and Schiller, that PSNH evaluate the need for heaters in their iso-phase bus ducts.

PSNH Investigation:

PSNH consulted with Eaton Electric. The purpose of the consultation was to evaluate the potential of a similar bus failure from occurring at Schiller or Merrimack Station. Eaton was familiar with the Wyman incident as they responded to the emergency call and made the necessary repairs to restore the bus. It was noted that the failure at Wyman occurred on a long run of non-segregated bus, not on the iso-phase. The repairs included, drying out the run of bus, locating the broken heater string, repairing the heaters, and re-energizing the bus. The root cause for the problem determined by Eaton was the heater string failed after the first section outside. The contributing cause was that the Wyman bus is configured such that there are very long runs (200 ft) of non-segregated bus. The bus bars associated with a non-segregated bus are all housed within a single enclosure.

Below is a description of the bus configurations at Schiller and Merrimack, as well as the findings of this evaluation. The determination supported below is that the investigation indicates that Merrimack and Schiller are low risk for bus duct failures similar to what occurred at Wyman for two reasons.

1) Merrimack and Schiller do not have long runs of non-segregated bus; and
2) Non-segregated bus is limited at the station and cleaned and tested periodically.

Schiller:

TB-1 breaker to the CT: This bus is mostly cable. There is a short section at either end of the cable run where a connection is made to non-segregated bus duct. The bus on the combustion turbine end is located in the heated CT compartment. The bus duct on the breaker end is within the plant.

TB-2: Is also mostly cable from the transformer to the breaker. There is a short section of non segregated bus duct on the breaker end of the cable run. The section of bus duct is within the plant.

TB-140: Feeds directly into the top of the switchgear house thru bushings in the roof.

Units 4, 5, and 6 have iso- phase bus from the generator output to the main transformer; these are short runs and are inspected and cleaned periodically. Iso- phase is extremely more robust and better than non-segregated bus. Non-segregated bus is inherently bad for parallel paths and tracking due to the many insulation systems. (phase to phase and phase to ground). Iso-phase is non insulated bus mounted on stand-off insulators. The iso- phase at Schiller leaves the generator and goes outside to the main transformer, the iso-phase bus duct also drops down and houses the potential transformers, lightning arresters, capacitors, and the load break switches on units 5 and 6. Unit 4 no longer has a load break switch. The load break switch acts as a disconnect switch for the running transformers. From the load side of the load break switch a cable runs out to a short piece of non-segregated bus between each RT-L and RT-H transformers.

Running transformer high side: Between each pair of transformers is a short section of non segregated bus work. The cables that feed the transformers leave the load break switches and run out through conduits that rise out of the ground where the cable then attaches to the non-segregated bus about in the middle of its span, except for unit 4 where the cables come from the top, but they still attach to the bus work about mid span.

Starting transformer high side: The high side of the starting transformers are configured much the same as the running transformers. The major difference is that the cables that feed them originate at a breaker rather than a load break switch.

Running and starting transformer low side: Cables leave the low sides of the running and starting transformers. These cables run most of the way to the switchgear. Near each section of switchgear the cables transition to non-segregated bus duct. The running transformer low side bus ducts are very short. The starting transformer bus ducts are considerably longer as they run from unit 4 through unit 5 and end at unit 6.

The CT generator is connected to the generator breaker via a non-segregated bus duct. This duct is fairly short, maybe 10 feet in length. There is another non segregated bus duct between the breaker and the transformer. This bus duct is approximately 15 feet long.

Merrimack:

The bus duct configuration at Merrimack is similar in that there are limited sections non-segregated bus duct.

Determination:

The determination of the investigation is that Merrimack and Schiller Stations are low risk for bus duct failures similar to the Wyman failure for two reasons:

1) Merrimack and Schiller do not have long runs of non-segregated; and
2) Non-segregated bus is limited at the station and cleaned and tested periodically.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-034

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. PSNH was to review its procedures regarding when a low oil alarm is received by the dispatcher. Please provide a copy of that review and a copy of any changes made to PSNH procedures in that regard.

Response:
Attached is the summary of the hydro personnel's review of the low oil alarm procedure when received by the dispatcher.

Interoffice Memorandum

To: Lynn Tillotson – Technical Business Manager

From: Dave Cribbie – Associate Engineer

Subject: Low Oil Condition

Cc: File 2009 – PUC Recommendation Response

PUC Order

PUC Request:
Reference Stipulated Settlement of Docket DE 09-091, Section IIA. PSNH was to review its procedures regarding when a low oil alarm is received by the dispatcher.

PSNH Response:
A review of this alarm/protection scheme associated with the lube oil system and associated equipment was completed by the Hydro Electrical Foreman. The determination was that no procedural changes will be implemented to this low oil alarm at this time.

However, the Hydro Electrical Group has been upgrading this protection system during major overhauls by installing thermal switches with dual sensing capability on the bearing. This effort started late in 2008. One sensor will trigger an alarm and prompt a field investigation and the second sensor if tripped will initiate a controlled shutdown. The current configuration is set up such there is no alarm for a no-oil condition, but there is double protection for the equipment associated with the lube oil system.

The double protection consists of the low oil alarm and high bearing temperature. The set points for the low oil alarm were reviewed and determined to be adequate. Both of these protection schemes are independent of one another and will initiate controlled shutdown of the unit if tripped. This configuration will reduce the possibility for a no oil situation which could result in equipment damage from occurring. For example if the low oil switch failed and resulted in a no oil condition the bearing temperature would reach its trip point and initiate a controlled shutdown.

In addition to the protection review a review of past outages for the period 2007 through 2009 was completed. There were three outages that could be attributed to a low oil condition.

1) 2007 – Amoskeag (2E);
2) 2007 – Amoskeag (F);and
3) 2008 Garvins Falls (4D).

The 2007, Amoskeag outages are related and the cause was identified as a faulty switch and repairs were made. The Garvins falls outage was caused by the return oil pump failing which resulted in a low oil condition the necessary repairs were made and a new pump was installed.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-035
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A and PSNH filing to the NHPUC dated May 7, 2010 regarding interconnection analyses for all hydro units and combustion turbines connected at lower voltages. Please make a copy of these studies available for review at PSNH's Manchester, NH office.

Response:
Consistent with PSNH's May 7, 2010 filing, analyses and studies are available for review at PSNH Energy Park in Manchester, NH. Please contact Lynn Tillotson at 634-2440 to arrange a date and time for reviewing the documents.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-036
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A and PSNH filing to the NHPUC dated May 7, 2010 regarding interconnection analyses for all hydro units and combustion turbines connected at lower voltages. Please explain why the Schiller CT was not included in your evaluation as it connects to the lower voltage PSNH system.

Response:
The CT at Schiller station is unique because the power generated has the capability to support three systems, each with a different a voltage capacity. The following is a brief description of the three systems the CT can support:

1) Feed TB-2 transformer and the voltage is stepped up to 115 kv (this is the normal set-up.); or
2) The CT generates 13.8 kv out of the generator and this can be fed directly into the station. From there it can either feed station service (black start); or
3) With switching, the power could be directed through TB-1 transformer and stepped up to 34.5 kv.

This referenced analysis evaluated the Schiller CT as a Bulk Power System asset, rather than a low voltage system asset. In May 2009, the NERC/ NPCC requirements changed. The changes required generation within NPCC that is greater than 20 MVA and connected to a substation with a voltage rating greater than 100 kv to be registered as a Bulk Power Asset and subject to NERC standards. This change required the CT to be registered as bulk power system asset because the CT has a 25 MVA capacity and the ability to tie into the 115 kv system. Registering as a bulk power system asset requires the facility to comply with NPCC standards including Directory III-Maintenance Criteria for BPS Protection. As required by this standard PSNH identified critical relays and implemented a comprehensive test program to comply with these standards. In March 2010, NPCC completed an audit of the NERC standards including Directory III and found no deficiencies. Reference document (GEN-8114).

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-037

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A and PSNH filing to the NHPUC dated May 7, 2010 regarding a relay testing program for all hydro units and combustion turbines connected at lower voltages. Please make a copy of PSNH Generation Protection System Maintenance and Testing (GEN-8114) and the PSNH Hydro Protective Relay Test Procedure available for review at PSNH's Manchester, NH office.

Response:
Consistent with PSNH's May 7, 2010 filing, a copy of PSNH Generation Protection System Maintenance and Testing (GEN-8114) and the PSNH Hydro Protective Relay Test Procedure are available for review at PSNH Energy Park in Manchester, NH. Please contact Lynn Tillotson at 634-2440 to arrange a date and time for reviewing the documents.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-038
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A and PSNH filing to the NHPUC dated May 7, 2010 regarding a relay testing program for all hydro units and combustion turbines connected at lower voltages. Please explain in detail all differences between the relay testing programs for the combustion turbines at Merrimack and Schiller and the relay testing program used for White Lake and Lost Nation.

Response:
The relay testing programs for the combustion turbines at Merrimack, Schiller, White Lake and Lost Nation are similar in that they all adequately verify the relays being tested are in good working order and the settings associated with the relay are within tolerance. The major difference is that the Merrimack and Schiller programs are required by NERC/NPCC and are set-up to demonstrate compliance with GEN -8114. Documentation of the test results is a controlled document and is required to be reviewed and signed – off by designated PSNH employees. This documentation is considered evidence and is auditable by NERC/NPCC. The Hydro relay test procedure is specific to the hydro units. Testing at the hydro facilities is generally completed by the hydro electrical group and the hydro procedure is set-up as a step by step procedure on how to test relays. These procedures are in reference documents - GEN-8114 and PSNH Hydro, Protective Relay Test Procedure.

Witness: William H. Smagula
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. PSNH was to perform an evaluation of procuring spare critical generator and turbine components or entering into contractual arrangements with other parties to reduce outage risk. By unit, please identify what PSNH determined to be a critical generator or turbine component and how that determination was made.

Response:
PSNH believes its turbine and generator rotors are all very important and provide customer value. While some elements are operated in a base-load fashion, others cycle or are used for peaking service. Regardless of the role a unit plays in the fleet, each contributes to the goal of avoiding high cost exposure to customers, and therefore are considered critical.

To assess either the procurement of spare rotors or partnering with suppliers or other users, PSNH has had lengthy discussions with Siemens Power Corporation representatives. Based on that dialogue, we have confirmed that:

- Few utilities have spare steam turbine or generator elements; even some who do are upgrading them to newer design to gain efficiency.
- Costs can run into multi-million dollars and proper storage, in controlled atmospheres, would have to be a consideration.
- Some items are in "seed" programs where they can fit in many different units. These types of programs exist for certain design exciters, turbine extension shafts, and generation rotors.
- The industry and major suppliers are improving their ability to fabricate steam turbine blades (i.e. 2 weeks in an emergency situation versus 12 - 20 weeks otherwise), to provide on-site rapid repair of generator stators, etc.
- PSNH currently maintains these spare elements: MK2 extension shaft, Schiller LP rotor, and MK2 generator stator coils.
- PSNH has a machine shop to support its turbine, generator, and other plant needs. This modest size group provides high value to assist in quick shop and field work. This is not a typical resource with other utilities.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-040

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. PSNH was to perform an evaluation of procuring spare critical generator and turbine components or entering into contractual arrangements with others to reduce outage risk. Please make a copy of all evaluations or contractual arrangements available for review at PSNH's Manchester, NH office.

Response:
Based on technical and commercial discussions with Siemens Power Corporation representatives, the knowledge learned and details obtained is summarized in the response to Q-STAFF-039. No formal written evaluations or contracts were made or put in place.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-041
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. PSNH agreed to adopt Mr. Cannata's recommendation that contracts with manufacturers of major components hold the manufacturer accountable for unreasonable delays and that transportation plans are in place prior to shipment. Please explain what actions PSNH has taken in that regard and make a copy of all such contractual arrangements available for review at PSNH's Manchester, NH office.

Response:
PSNH engaged Siemens Power Corporation representatives to review transportation practices and policies with the following points highlighting the outcome.

- Outage schedules are applied for and approved by ISO-NE. Once confirmed, the outage work plan and schedule is finalized. If major items are to be shipped off-site for repairs, each item's departure and return date is determined once the repair plan is committed to by each vendor.
- Each repair plan is subject to change, potentially changing the return date, based on actual condition of each item upon detailed shop inspection.
- Weights and widths are confirmed and historical knowledge is factored into the schedule and work plan.
- To the greatest extent possible, if certain tasks can be performed in the field vs. in a shop, the work is kept on-site.
- Professional and experienced logistical and transportation experts are used who know where shipping restriction risks may occur.
- PSNH does a very good job paying attention to this topic vs. other generators in New England.

As a result of these discussions, the following changes have been made:

- Planned major maintenance outages, where an item is planned to go off-site and where such items are either critical path or close to critical path, will have the start day of the work specifically selected to optimize transportation logistics. Rather than start, as is typical, on a Saturday, the transportation days will be targeted to minimize delays.
- Formal dialogue between PSNH and the vendor's transportation department, as warranted, will be conducted to seek a shortest schedule, with contingencies considered.

No contractual arrangements were necessary to be executed.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-042
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section II.A. PSNH was to perform its own analysis of extensions to maintenance cycles rather than relying solely on the manufacturer's recommendations associated with major components. Please make a copy of any evaluations made available for review at PSNH's Manchester, NH office.

Response:
PSNH continuously makes assessments of its maintenance needs associated with its generating stations. PSNH factors in equipment conditions based on last repairs, current condition, historical knowledge, non-destructive examination, etc. Manufacturer's technical input is also a key element in planning work, but does not necessarily dictate the timing of the scope. PSNH's managers and equipment specialists factor their experience into the decision of scope in any given year. Another element that also influences planned work is the amount of starts/stops, as well as the hours of operation of the unit or equipment under review. The target is to complete repairs when needed, not sooner or later, based on the full and ongoing knowledge of all data and technical analysis performed.

There are no written evaluations or analyses available.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-043
Page 1 of 3

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Stipulated Settlement of Docket DE 09-091, Section III.D. PSNH was to establish a protocol for transmission and distribution workers performing activities in substations containing PSNH generating units. Please provide a copy of that protocol and a listing of all the units to which it applies.

Response:
Attached is a copy of the updated work practices implemented at all hydro facilities.

Interoffice Memorandum

To: Lynn Tillotson – Technical Business Manager

From: Dave Cribbie – Associate Engineer

Subject: T&D Work Protocol

Cc: File 2009 – PUC Recommendation Response

PUC - Recommendation:
Establish a protocol for transmission and distribution workers performing activities in substations containing PSNH generating units

PSNH Response:
Beginning in 2009, PSNH Generation implemented new work practices to better control access to unmanned hydro facilities. The purpose of the new work practice is to put in place additional measures to ensure proper communication between the PSNH groups occurs prior to initiating work. Better controlling access to hydro generating facilities is relevant because in most cases substation controls are located in the powerhouse. Attached is a copy of the new work practices.

Hydro Generation Station Access

Access to the PSNH Hydro generation facilities is under the exclusive control of Hydro management. Card readers are in use at all hydro generation stations and the system is monitored continuously by Pelmac co. for unauthorized entry when station personnel are not present. If an NU employee requires unescorted access to a hydro, the employee must make a request for access to their supervision. The supervisor must then gain approval from the Hydro Station Manager, O&M manager or their designee. Reason for access must be stated. Access is typically granted to employees that need entry to service equipment located at shared facilities (substation controls located in a generation building) but each request will be decided on an individual basis. After receiving written notice that the approval has been granted the hydro security person will then, request a badge from the PSNH security officer, activate and deliver the access badge. Non-employees will not be considered for unescorted access.

In addition PSNH access to substations is strictly controlled in order to prevent unauthorized entry and to establish proper communication between entrants, ESCC and the control room. PSNH maintains the Substation Key and Access policy (SH-6036) this procedure is intended to control access to all PSNH substations including those located at generating stations. This policy affects <u>all</u> NU employees and indentifies three distinct work classifications each requiring a certain level of training:

- <u>Type I</u> – Observation, Inspection and Simple Deliveries.
- <u>Type II</u> – Non- Electrical physical work – Examples grounds maintenance & snow removal.
- <u>Type III</u> – Electrical Work Physical & Non-Physical – Example electrical maintenance and testing

Regardless of the type of work to be performed, notification to the ESCC and the Generating Station's Control Room is <u>required</u> prior to entering and upon exiting the substation. The intent of the notification is to inform potentially affected personal of the scope of work to be performed within the substation. Better communication between the PSNH groups will reduce the potential for incidents.

In addition when tagging is necessary to perform work within a generation substation at or beyond the point of demarcation a Transmission Outage Application (TOA) needs to be submitted for thorough review to ensure safety and reliability are not compromised. The (TOA) process must be completed and approved in accordance with PSNH procedure OP-0003 prior performing work.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-044
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please make the 5-year and 10-year capital and O&M budgets for Merrimack, Schiller, and Newington stations and the hydro units and combustion turbines available for review at PSNH's Manchester, NH office.

Response:
The 5-year and 10-year capital and O&M budgets for Merrimack, Schiller and Newington Stations and the hydro units and combustion turbines are available for review at PSNH Energy Park in Manchester, NH. Please contact Lynn Tillotson at 634-2440 to arrange a date and time for reviewing the documents.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-045
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please make the 2009 budgeted and actual capital and O&M expenditures for Merrimack, Schiller, and Newington stations and the hydro units and combustion turbines as a group available for review at PSNH's Manchester, NH office.

Response:
The 2009 budgeted and actual capital and O&M expenditures for Merrimack, Schiller and Newington Stations and the hydro units and combustion turbines are available for review at PSNH Energy Park in Manchester, NH. Please contact Lynn Tillotson at 634-2440 to arrange a date and time for reviewing the documents.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-046
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please provide detailed outage summaries of the scheduled maintenance outages that took place for Merrimack, Schiller, and Newington stations in 2009 (Outage books). Please make this information available for review at PSNH's Manchester, NH office.

Response:
The outage summaries (outage books) for the scheduled maintenance outages that took place at Merrimack, Schiller and Newington Stations in 2009 are available for review at PSNH Energy Park in Manchester, NH. Please contact Lynn Tillotson at 634-2440 to arrange a date and time for reviewing the documents.

Public Service Company of New Hampshire	**Data Request STAFF-01**
Docket No. DE 10-121	**Dated: 06/16/2010**
	Q-STAFF-047
	Page 1 of 1

Witness:	**William H. Smagula**
Request from:	**New Hampshire Public Utilities Commission Staff**

Question:
For 2009, please list the events caused by PSNH/NU distribution and/or transmission personnel or their contractors which caused a trip of any generator. For each such event, please indicate whether replacement power was required or not, the date of occurrence, and the party responsible. If the event was caused by a contractor, please also indicate whether PSNH supervision was present. Do not list as part of your response events caused by equipment failure, faults, lightning, etc.

Response:
In 2009 there were no events caused by PSNH/NU distribution and/or transmission personnel or their contractors which caused a trip at Merrimack, Schiller, Newington Stations or at any hydro unit. However, the Jackman GSU failure which occurred in 2008, required a 9-day planned outage in 2009 to tie in new equipment. In addition to the outage, in some instances during 2009, Jackman hydro was running at a constrained capacity. The cost associated with both the lost generation due to the constrained capacity and the 9-day outage was reimbursed as part of an insurance settlement agreement.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-048
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, page 2, lines 23-27. Please provide in tabular form the PSNH fleet generation from 2004 through 2009 calculated consistent with the 3,788,627 MWH stated for 2009.

Response:
Below is the PSNH fleet net generation from 2004 through 2009.

	2004	2005	2006	2007	2008	2009
Net Generation	6,197,017	5,637,286	4,579,261	4,890,326	4,366,468	3,788,627

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-049
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, page 2, lines 23-27. Please provide in tabular form the PSNH fleet generation availability for the 30 days of highest market prices from 2004 through 2009 consistent with the 97.4% stated for 2009.

Response:
Below is the PSNH fleet availability for the 30 days of highest market prices for 2004 - 2009.

	2004	2005	2006	2007	2008	2009
Availability	97.9	94.3	97.6	99.1	98.0	97.4

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-050

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, page 2, lines 23-27. Please provide a listing of the units that PSNH used in its fleet calculations.

Response:
The fleet calculations for total generation include the 6 steam plants, as listed below, plus the 9 hydro stations and the 5 combustion turbines. The availability during the 30 highest priced days include the 6 steam plants listed below.:

Newington
Merrimack-1
Merrimack-2
Schiller-4
Schiller-5
Schiller-6

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, page 3, lines 16-17. Please provide in tabular form the PSNH fleet generation equivalent availability from 2004 through 2009 calculated consistent with the 84.4% value stated for 2009.

Response:
Below is the PSNH fleet equivalent availability from 2004 through 2009.

	2004	2005	2006	2007	2008	2009
PSNH Fleet EAF	89%	85%	88%	91%	85%	84%

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-052

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, page 4, lines 8-11. Please explain how PSNH determines the balance between necessary spending in critical areas and the overall cost of production. Does this balancing mean that required capital or maintenance work would not be performed to meet cost goals? Please explain in detail what controls determine actual versus budgeted levels of expenditures.

Response:
PSNH Generation has goals that are consistent with providing customers low cost generation from reliable plants that are operated safely, efficiently and meet environmental requirements. Generation receives sufficient funds to satisfy those goals. An appropriate balance of these efforts is maintained by establishing not only cost goals, but also goals related to reliability, availability and other performance goals. If projects are delayed to meet cost goals, the reliability and availability goals can be negatively impacted. Therefore, PSNH maintains an appropriate focus on the collective goal of maximizing customer value.

PSNH Generation management reviews budget requests in the third quarter of each year for the upcoming calendar year as well as projections for future years. Budget requests associated with the repair or replacement of critical components are typically planned well in advance to the start of the project and and are included in the 5 year plan. Budgeted expenditures are developed with the intent to cover the cost of the project as it is originally defined. Actual expenditures refer to the actual cost which may often vary from the budgeted value. The variances could be greater than or less than the original budgeted value due to updated pricing, change in scope, etc. When considering replacement or repair options for critical components a review is completed to determine which option is in the best interests of PSNH's customers. PSNH Generation makes budget determinations based on maintenance records, test data, consulting experts, past experiences, and other generating facilities' experiences. This process is a balanced approach and designed to maximize the use and value of each component. As the review and work plans are finalized, budget estimates get updated with vendor quotes and more refined details. Late in the year, budgets are finalized with the latest available information. During the following calendar year, planned work can still change if/when new information is obtained, or there is a change in priority as new work becomes identified, or other dynamics require the work plan to be updated. Also, refinement takes place on actual versus planned scope to focus on expending only what is needed to meet customer needs and goals.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-053
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, Bates page 142, PSNH Steam Unit Availability. Please supply annual figures for the units listed in the availability table.

Response:
Below are the annual availability numbers consistent with the Steam Unit Availability monthly availability table on page 142 of Mr. Smagula's testimony.

	Merrimack	Merrimack	Newington	Schiller	Schiller	Schiller
	Unit 1	Unit 2	Unit 1	Unit 4	Unit 5	Unit 6
2009	94.6%	59.4%	94.2%	94.8%	86.5%	84.8%

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-054
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference Smagula testimony, Bates page 142, PSNH Steam Unit Availability. Please recalculate the availability table as shown but excluding the four planned maintenance outages. As part of your response, please also include annual figures for the units listed in the availability table.

Response:
Below is the Steam Unit Availability table provided in the Smagula testimony recalculated to exclude the four planned maintenance outages, specifically the Merrimack 2 outage in August to December, the Newington outage in March, the Schiller 5 outage in April, and the Schiller 6 outage in September/October. The corresponding annual figure has also been included.

PSNH Fossil Steam Unit Availability
January 2009 through December 2009
WITH PLANNED MAINTENANCE OUTAGES REMOVED

	Merrimack Unit 1	Merrimack Unit 2	Newington Unit 1	Schiller Unit 4	Schiller Unit 5	Schiller Unit 6
January	100.0%	100.0%	99.8%	83.4%	85.1%	100.0%
February	100.0%	75.4%	100.0%	100.0%	100.0%	100.0%
March	100.0%	100.0%	100.0%	87.3%	90.9%	100.0%
April	85.1%	86.4%	100.0%	100.0%	76.9%	98.4%
May	97.2%	84.0%	100.0%	100.0%	99.8%	86.1%
June	100.0%	93.1%	98.9%	91.8%	100.0%	96.7%
July	90.9%	94.7%	100.0%	96.7%	97.5%	85.9%
August	100.0%	99.5%	99.5%	100.0%	100.0%	76.5%
September	100.0%	NA	100.0%	100.0%	100.0%	100.0%
October	86.5%	NA	81.3%	100.0%	84.2%	97.5%
November	98.1%	NA	99.3%	100.0%	83.3%	93.0%
December	89.0%	99.8%	94.4%	83.2%	85.9%	99.9%
Annual	**94.60%**	**91.30%**	**97.40%**	**94.80%**	**90.90%**	**94.40%**

Public Service Company of New Hampshire	**Data Request STAFF-01**
Docket No. DE 10-121	**Dated: 06/16/2010**
	Q-STAFF-055
	Page 1 of 1

Witness:	**William H. Smagula**
Request from:	**New Hampshire Public Utilities Commission Staff**

Question:

Reference Smagula testimony, Bates page 145, PSNH Steam Unit Availability. Please explain separately the reason(s) for the decrease in unit capacity factor for Schiller-4 in 2009. Include in your response the fact that there was no annual maintenance outage for this unit in 2009.

Response:

Schiller #4 had an equivalent availability factor (EAF) of 95% in 2009. The unit typically completes scheduled outages on an 18 month cycle, which resulted in no annual overhaul scheduled for the unit in 2009. Schiller #4's capacity factor was just less than 60%. This capacity factor reflects the fact that the unit was available for the vast majority of the year with only 17.8 days of forced outage time and for the remainder of the year varied its load or was on stand-by consistent with lower electrical demand and energy costs in the region. Schiller #4 is able to operate efficiently between 25 - 45 MW and has a low load minimum of 13 MW.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-056
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please make available for review at PSNH's Manchester, NH office the 2009 NERC Generating Availability Data System (GADS) data for each unit for which PSNH compiles the data.

Response:
The 2009 NERC Generating Availability Data is available at PSNH Energy Park in Manchester, NH. Please contact Lynn Tillotson at 634-2440 to arrange a date and time for reviewing the documents.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-057
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please supply the annual dollar value of rent received from the storage of Seabrook Station parts at Newington for the years 2005 through 2009.

Response:
Listed below is the annual dollar value of rent received from the storage of Seabrook Station parts at Newington Station for the years 2005 through 2009.

	2005	2006	2007	2008	2009
Rent ($)	$25,565.52	$25,565.52	$25,565.52	$29,619.12	$32,452.64

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01
Dated: 06/16/2010
Q-STAFF-058
Page 1 of 1

Witness: William H. Smagula
Request from: New Hampshire Public Utilities Commission Staff

Question:
Please identify any discovery response PSNH filed in DE 09-180 that relates to the topics of capacity or energy planning, unit operation, or unit outages.

Response:
The listed data requests were filed in DE 09-180 by witnesses Errichetti, White, and Smagula and relate to topics of capacity, energy planning, unit operation or unit outages:

SET	Question
Staff 01	Staff 009
Staff 01	Staff 010
Staff 01	Staff 012
Staff 01	Staff 013
Staff 01	Staff 016
Staff 01	Staff 019
Staff 01	Staff 020
OCA 01	OCA 010
OCA 01	OCA 013
OCA 02	OCA 003
Trans 01	TC 001
Trans 01	TC 006
Trans 01	TC 009
Trans 01	TC 013
Trans 01	TC 016
Trans 01	TC 022
Trans 01	TC 023
Trans 01	TC 024
Trans 01	TC 025
Trans 01	TC 026
Trans 02	TC 009
Trans 02	TC 010
Trans 03	TC 004
Trans 03	TC 005
HD-01	RR 002

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
For each of the fossil units, please provide the heat rates for the years 2005 – 2009. Please also describe actions taken during those years to improve the heat rates and/or otherwise improve operational efficiencies.

Response:
Below are the average annual heat rates for years 2005 - 2009. The full load heat rate, often a better indicator of efficiency improvements, is also provided for 2009. Efforts taken to maintain and improve heat rates over the years include the following:

Routinely completing boiler tuning and optimization
Installing more efficient boiler control systems
Installing more efficient air conditioning at MK and NT
Installing new high pressure feedwater heaters
Instituting a new condenser cleaning procedure at MK2
Increasing the generator H2 purity from 95 to 97% at MK2
Adding capacitors to the SBAC motor at MK2
Increasing the generator H2 purity from 97 to 98.5% at MK2
Increasing Merrimack's compressed air system efficiency by adding a new 100 psi air compressor and 100 & 300 psi receiver tanks.
Improving lighting efficiency by changing out lights at Newington, Merrimack, and Schiller Stations.
Reducing MK2 air heater leakage by retubing portions of the air heater.
Replacing the MK 2 HP/IP turbine
Reducing the MK2 air heater cold end average to improve overall efficiency
Reducing SBAC energy consumption by 5% by upgrading the SBAC controls
Installing new air compressors
Replacing the air ejector at Schiller 6

Witness: **David A. Errichetti,Jody J. TenBrock**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to STAFF 1-3. Please explain why the Newington and Schiller-6 outages have a $0 replacement power cost (RPC). Does an outage with $0 RPC mean that the outage actually had an economic benefit? If so, please provide the economic benefit of the outages in this response with $0 RPC as well as in the response to STAFF 1-2. If there was not an economic benefit, please explain the circumstances that cause there to be $0 RPc. Please confirm that the methodology used is valid.

Response:
The planned Newington 3/6-18/09 and planned Schiller 6 8/28-10/4/09 outages have $0 RPCs because the analysis showed that, on balance, the units would not have run during those outages because there were less expensive alternatives available to serve ES load, such as spot purchases. With respect to Newington this assessment is simplified by comparing Newington's dispatch price to LMPs prior to determining whether Newington's generation would be below or above the load line. As such, there is no explicit estimate of how much was saved by not running Newington instead of taking the planned outage. For the coal units and Schiller 5 the unit is assumed to operate and the cost to serve ES load is calculated with and without the unit in question running. Thus we estimate that had Schiller 6 operated instead of being on its planned outage the cost to serve ES load would have been higher by $761k.

The following table is the same as that provided in response to Staff-01, Q-Staff-002 expanded to show the negative replacement power costs for the Schiller 5 and 6 (note the May 4 through May 8 outage should have been labeled Schiller 6) consistent with the foregoing discussion. Also, consistent with the Newington discussion above the Newington 10/6-11/09 outage still indicates $0 RPC.

The methodology for the calculation of replacement power costs for outages as explained in Staff-01, Q-Staff-002 and further detailed above is valid and is consistent with the how replacement power costs have been calculated since the FPPAC was in effect.

Merrimack 1

Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
04/20/2009	(40)	0	0	0	(40)
04/21/2009	1,239	0	0	1,350	(110)
04/22/2009	6,505	26,261	0	3,049	(22,804)
04/23/2009	8,420	21,857	0	2,485	(15,922)
04/24/2009	328	0	0	329	(1)
Total	16,452	48,118	0	7,213	(38,879)
07/21/2009	(3,790)	30,516	0	0	(34,306)
07/22/2009	(1,324)	46,691	41,577	106	(89,699)
07/23/2009	31,435	11,638	0	22,554	(2,758)
07/24/2009	6,884	564	0	6,352	(32)
Total	33,204	89,410	41,577	29,012	(126,796)
10/26/2009	19,133	20,098	0	7,766	(8,730)
10/27/2009	43,095	29,302	0	30,621	(16,827)
10/28/2009	44,619	32,281	0	29,267	(16,930)
10/29/2009	44,139	20,527	0	35,724	(12,112)
10/30/2009	38,213	6,835	0	35,250	(3,872)
Total	189,199	109,043	0	138,627	(58,471)
12/01/2009	17,277	47,210	0	0	(29,933)
12/02/2009	30,144	105,554	0	9,177	(84,586)
12/03/2009	21,174	57,370	58,702	0	(94,898)
12/04/2009	17,738	73,423	40,605	0	(96,290)
12/05/2009	(651)	11,341	0	0	(11,991)
Total	85,682	294,897	99,308	9,177	(317,699)

Merrimack 2

Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
02/12/2009	36,151	99,851	19,559	0	(83,258)
02/13/2009	98,370	98,916	213,626	0	(214,172)
02/14/2009	96,761	154,272	148,089	0	(205,600)
02/15/2009	99,619	141,200	146,820	0	(188,401)
02/16/2009	78,894	302,398	0	0	(223,504)
02/17/2009	14,875	57,095	0	0	(42,221)
Total	424,670	853,733	528,094	0	(957,157)
02/25/2009	25,031	114,496	0	0	(89,465)
02/26/2009	60,361	164,104	124,268	0	(228,011)
02/27/2009	23,444	77,572	97,840	0	(151,968)
Total	108,836	356,172	222,107	0	(469,444)
04/02/2009	468	3,389	0	0	(2,921)
04/03/2009	48,201	54,800	0	9,320	(15,920)
04/04/2009	43,407	112,901	0	4,367	(73,861)
04/05/2009	36,847	100,654	0	2,663	(66,470)
Total	128,923	271,745	0	16,350	(159,173)
05/11/2009	26,460	45,861	0	2,463	(21,864)
05/12/2009	64,109	131,653	0	1,373	(68,917)
05/13/2009	61,499	129,440	0	1,726	(69,666)
05/14/2009	63,562	143,329	0	2,573	(82,340)
05/15/2009	79,908	150,406	0	234	(70,733)
05/16/2009	46,480	78,527	0	1,829	(33,876)
Total	342,017	679,216	0	10,197	(347,397)
06/26/2009	73,294	24,108	0	64,641	(15,455)
06/27/2009	49,675	54,563	0	22,328	(27,217)
06/28/2009	23,071	21,261	0	12,323	(10,512)
Total	146,040	99,932	0	99,292	(53,184)

Newington

Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
10/06/2009	0	0	0	0	0
10/07/2009	0	0	0	0	0
10/08/2009	0	0	0	0	0
10/09/2009	0	0	0	0	0
10/10/2009	0	0	0	0	0
10/11/2009	0	0	0	0	0
Total	0	0	0	0	0

Schiller 4

Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
01/05/2009	(649)	4,802	0	89	(5,540)
01/06/2009	(4,117)	49,002	0	0	(53,118)
01/07/2009	(1,788)	48,050	0	0	(49,837)
01/08/2009	4,950	31,818	0	4,185	(31,053)
01/09/2009	9,995	50,987	0	2,441	(43,433)
01/10/2009	20,313	0	0	20,313	0
Total	28,704	184,658	0	27,028	(182,982)
12/08/2009	(4,303)	13,374	0	0	(17,677)
12/09/2009	2,700	2,072	0	3,705	(3,077)
12/10/2009	(1,058)	5,978	0	0	(7,036)
12/11/2009	769	8,971	0	0	(8,201)
12/12/2009	6,160	0	0	6,160	0
12/13/2009	0	0	0	0	0
Total	4,267	30,395	0	9,864	(35,992)

Schiller 5

Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
01/26/2009	20,272	0	0	20,272	0
01/27/2009	31,189	0	0	31,189	0
01/28/2009	23,491	12,803	0	20,814	(10,126)
01/29/2009	1,419	14,311	29,139	135	(42,165)
01/30/2009	8,184	5,048	22,265	3,141	(22,269)
01/31/2009	106	0	0	106	0
Total	84,661	32,162	51,404	75,656	(74,561)
10/01/2009	(4,976)	11,337	0	0	(16,313)
10/02/2009	(15,515)	15,651	0	496	(31,663)
10/03/2009	(11,397)	22,495	0	1,197	(35,089)
10/04/2009	(14,146)	14,482	0	738	(29,366)
10/05/2009	(2,827)	9,846	0	2,004	(14,677)
10/06/2009	(568)	1,631	0	912	(3,112)
Total	(49,430)	75,442	0	5,347	(130,219)
11/20/2009	0	0	0	0	0
11/21/2009	(166)	13,795	0	800	(14,760)
11/22/2009	(7,663)	13,535	0	0	(21,198)
11/23/2009	(840)	8,040	0	485	(9,365)
11/24/2009	(2,029)	9,684	0	421	(12,134)
11/25/2009	0	0	0	0	0
Total	(10,697)	45,054	0	1,705	(57,456)
12/13/2009	3,766	13,422	0	1,638	(11,294)
12/14/2009	2,833	7,062	0	1,064	(5,294)
12/15/2009	1,243	9,450	0	107	(8,315)
12/16/2009	7,198	6,129	0	4,355	(3,286)
12/17/2009	7,267	0	0	7,267	0
Total	22,306	36,063	0	14,431	(28,187)

Schiller 6

Date	Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
05/04/2009	0	0	0	0	0
05/05/2009	(528)	555	0	0	(1,083)
05/06/2009	0	0	0	0	0
05/07/2009	0	0	0	0	0
05/08/2009	0	0	0	0	0
Total	(528)	555	0	0	(1,083)

Total All Units 2009

Total RPC ($)	Spot Purchases ($)	Bilateral Purchases ($)	PSNH Gen ($)	Avoided Fuel ($)
1,554,308	**3,206,595**	**942,490**	**443,902**	**(3,038,679)**

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-003
Page 1 of 2

Witness: **Robert A. Baumann,Jody J. TenBrock**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to STAFF 1-6. Please provide the supporting calculations for the Schiller coal monthly fuel costs ($/MWH) and explain why there can be large changes in the monthly fuel costs. Are large swings in the monthly $/MWH fuel costs due mainly to changes in generation levels? Please also provide the entire table on a $/MMBtu basis as requested in the original question.

Response:
The attached schedule provides the requested supporting calculations for the monthly fuel costs (excluding wood).

The primary drivers of the swings in fuel costs are the generation levels and the cost of coal that was purchased in 2008.

During 2008, when coal and power markets were at much higher levels, PSNH's coal supplier in Venezuela failed to deliver under the contract. PSNH subsequently solicited for replacement coal using a RFP process. This coal was delivered in June 2009 and was burned, by itself, or as a blend with the existing inventory, primarily in June and August through October 2009. The cost of the RFP replacement contract coal was higher than the average cost of coal in the existing Schiller fuel inventory.

PSNH does not track its fuel cost data in the $/MMBtu format. Accordingly, that data is not available.

2009 Schiller Fossil Fuel Costs (excl Wood)

In 000's	January	February	March	April	May	June	July	August	September	October	November	December
Coal	$ 2,631	$ 2,252	$ 1,892	$ 2,366	$ 1,713	$ 1,737	$ 911	$ 2,405	$ 1,293	$ 3,284	$ 1,616	$ 2,956
Other Fossil Fuels (1)	666	13	161	228	110	1	2	43	151	168	77	24
Allowances	116	114	99	112	86	48	38	77	40	95	92	105
Handling/Residual Costs	408	464	520	734	298	381	230	347	424	660	302	715
Total Schiller Costs excl-wood	$ 3,821	$ 2,843	$ 2,673	$ 3,440	$ 2,207	$ 2,167	$ 1,181	$ 2,871	$ 1,907	$ 4,207	$ 2,087	$ 3,799
Generation MWH	51,610	48,890	51,310	45,297	42,158	26,977	18,937	38,951	19,784	44,423	44,009	54,925
$ per MWH	$ 74.05	$ 58.16	$ 52.09	$ 75.95	$ 52.34	$ 80.33	$ 62.38	$ 73.70	$ 96.40	$ 94.71	$ 47.43	$ 69.16
Coal in 000's of Tons	25.9	24.2	25.1	22.9	23.0	14.4	10.4	21.3	11.1	22.3	22.7	27.7
Unit Cost of Coal	$ 101.51	$ 93.03	$ 75.43	$ 103.50	$ 74.56	$ 120.32	$ 87.91	$ 113.02	$ 115.97	$ 147.46	$ 71.08	$ 106.65

Note 1-- Oil, gas, and jet fuel

Public Service Company of New Hampshire	**Data Request STAFF-02**
Docket No. DE 10-121	**Dated: 08/13/2010**
	Q-STAFF-004
	Page 1 of 2

Witness: **David A. Errichetti,William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to STAFF 1-8, Supplemental-I. The forecasted capacity factors stated in the response appear to be significantly lower than the historical capacity factors stated in the testimony of Mr. Smagula. Please reconcile the differences by unit. In addition, please explain in detail how PSNH models unit capacity factor between planned outages for supplemental purchases and how it makes supplemental purchases for that unit during the period between planned outages.

Response:
Forecasted capacity factors are based on an historical average of between outage capacity factors. Any specific operational scenarios during the year are reflected and noted as appropriate. Planned overhaul schedules are then included to forecast the annual capacity factor. The table attached illustrates the elements of the 2009 forecast.

For purposes of estimating supplemental energy purchase requirements prior to the start of year, PSNH assumes 100% availability between planned outages, and operation consistent with forecast unit dispatch prices as compared to energy market prices. Historically, supplemental energy purchases have been a function of the gap between the forecast ES load requirement and expected economic generation. All other things being equal planned outages of otherwise economic generation increases supplemental energy purchase requirements. For outages that occur during the year with forewarning, supplemental purchases can be made prior to or during the outage if system conditions warrant such action. For outages that occur during the year without forewarning, supplemental purchases can be made during the outage if system conditions warrant such action but can be limited by uncertainty including outage duration.

	Avg CF Between Outages 2000-08	CF for ES planning in 2009	COMMENT	2009 Planned outage durations	# of between outage weeks	between outage weeks w/ avg CF	equiv annual CF calculated for ES	CF as forecasted
				wks	wks	wks		(%)
MK1	91.2	89	2nd year of 2 yr overhaul cycle	0	52	46.28	89%	88.27
MK2	85.4	86		18	34	29.24	56%	55.66
SR4	77.9	77	no overhaul during the year	0	52	40.04	77%	76.36
SR5	78.0	85	New boiler, early years not indicative of going forward operation	5.5	46.5	39.525	76%	75.73
SR6	79.2	79		5	47	37.13	71%	70.44

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-005
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to STAFF 1-9. Please verify that STAFF 1-9 describes the purchases shown in TC 1-2 correctly. If not, please explain any differences.

Response:
Staff-01, Q-Staff-009 correctly describes the purchases shown in TC-01, Q-TC-002 but for one exception: Staff-01, Q-Staff-009 missed an energy purchase made in November, 2008 noted in TC-01, Q-TC-002.

Staff-01, Q-Staff-009 SP01 corrects this oversight in the narrative of 2008 energy purchases for the 2009 ES power supply.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-007
Page 1 of 1

Witness: **Erica L. Menard**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please supply all economic forecast updates received by PSNH or NU from 1/1/08 through 12/31/09 regarding the health/growth of the US economy.

Response:
As part of a subscription with Moody's Analytics, Inc., PSNH/NU receives copyrighted Precis reports published by Moody's Economy.com for the state of New Hampshire. These reports are prepared by Moody's three times per year.

Copies of these copyrighted materials will be available for inspection at Energy Park in Manchester.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-008
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please detail all efforts taken by PSNH to mitigate (unwind) continuing downward expectations in energy sales with respect to its committed portfolio during 2009 by month.

Response:
Through the final ES rate setting filing in early December 2008 PSNH's analyses indicated that the supplemental energy purchases already made were, for the most part, still likely going to serve load. Please see the response to Staff-02, Q-Staff-009 for a discussion of how PSNH manages energy purchases surplus to ES energy needs.

In late 2008 PSNH sold 200 MW of supplemental energy purchases for January and February and relied on Newington to meet ES energy requirements during high load / high priced periods. PSNH purchased from the spot market supplemental energy requirements to the extent there were low priced periods where Newington could be utilized as a reserve generation asset

Public Service Company of New Hampshire | **Data Request STAFF-02**
Docket No. DE 10-121 | **Dated: 08/13/2010**
Q-STAFF-009

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:

With respect to supplemental purchases that have previously been made, please describe PSNH's strategy(ies) regarding the potential sale of that energy and/or capacity. Does PSNH attempt to sell those commodities in light of changing load requirements or does it prefer to retain them? Please provide the reasoning supporting all strategies.

Response:

With respect to supplemental purchases that have been previously made, PSNH does not have a specific strategy to either retain them or sell them in light of changing load requirements. PSNH retains the flexibility to utilize both approaches. The key items which influence whether existing supplemental purchases should be retained or sold prospectively are:

- Forecasted ES customer load requirements including customer migration levels, historical migration patterns and load uncertainty due to weather, and
- PSNH's generation availability and economics including generation outage uncertainty and utilization of Newington generation in place of supplemental purchases

Ultimately excess energy (relative to PSNH's ES customer load requirements) will be sold either bilaterally or in the spot market. There is no certainty that a decision to make a prospective bilateral sale will result in a higher price than a decision to rely on a spot market sale.

Wholesale Power Contracts department policy, in part, prohibits selling energy purchases if it is done with the expectation that it will be repurchased at a later date at a lower price. Thus energy purchases can only be unwound if PSNH is highly certain that the ES requirement that the purchase was meant to serve no longer exists.

Public Service Company of New Hampshire	**Data Request STAFF-02**
Docket No. DE 10-121	**Dated: 08/13/2010**
	Q-STAFF-010
	Page 1 of 1

Witness:	**David A. Errichetti**
Request from:	**New Hampshire Public Utilities Commission Staff**

Question:
At any time during 2009, did PSNH refrain from making additional purchases of supplemental energy to meet its forecasted load requirements as supported by its then current sales forecast? If so, and if the answer to the previous question is that PSNH's strategy is not to resell its supplemental purchases, please reconcile why PSNH is willing to forgo purchases justified by its current sales forecast, but is reluctant to entertain sales regarding same.

Response:
In 2009 PSNH entered into one long term bilateral purchase to provide price certainty during the Merrimack Unit #2 turbine repair outage. The total initial forecasted purchase requirement was 300 MW. PSNH entered into the one bilateral arrangement for 200 MW on January 29, 2009 and planned to make a subsequent additional purchase of 100 MW. However, due to customer migration uncertainty, PSNH did not purchase the additional 100 MW.

Additionally, PSNH reviews its day ahead sales forecast and determines whether next day supplemental purchases are needed. These purchases can, and have been, made from the bilateral markets and from the spot markets.

Please see the response to Staff-02, Q-Staff-009 as to PSNH management of energy purchases surplus to ES requirements.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-011
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please explain in detail the administrative decision process regarding additional supplemental energy purchases including identification of the person that makes the ultimate decision to purchase additional resources or to sell existing supplemental resources already purchased. In both cases, please identify the individual that is responsible for the final decision. If the individual is an NU employee rather than a PSNH employee, please provide the reasoning. Also as part of your response, please detail when in the process PSNH's input is sought and the weight that PSNH's input is given.

Response:
The Wholesale Power Contracts department has primary responsibility for the analysis of PSNH's supplemental energy requirements. In addition to market information obtained directly by Wholesale Power Contracts the analysis incorporates inputs from various departments, mainly PSNH generation, PSNH fuel purchasing and NUSCo/PSNH economic and load forecasting. The resulting analysis results are reviewed jointly by NUSCo and PSNH staffs and both are involved in the subsequent development of supplemental energy purchasing plans and strategies. These reviews and development of consequent plans and strategies have included the following personnel over time: Gary Long, President - PSNH; John MacDonald, Vice-President Generation - PSNH; Paul Ramsey, Vice-President Energy Delivery - PSNH; Terrence large, Director - Business Planning and Customer Support Services;Stephen Hall, Rate and Regulatory Services Manager; William Smagula, Director- PSNH Generation; Elizabeth Tillotson, Technical Business manager Fossil/Hydro ; Gerald Eaton, Senior Counsel; Robert Baumann, Director Revenue Regulation and Load Resources; James Shuckerow, Director Wholesale Power Contracts; Stan Puzio, Manager Revenue Regulation and Load Resources; Wayne Chapman, Team leader Revenue Regulation and Load Resources; Richard Labrecque,Supplemental Energy Sources Manager; David Errichetti, Manager Generation Resource Planning; Patrick Smith, Manager Wholesale Power Contracts; Frederick White, Senior Engineer Wholesale Power Contracts. The President - PSNH approves such plans prior to execution, in accordance with established procedures.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-012
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please describe in the same form (i.e., same groupings in terms of months) used in the response to TC 2-9 in Docket DE 09-180 the bilateral strip purchases made for 2009.

Response:
The timing of the firm bilateral strip purchases made for 2009 delivery consistent with the response to TC 2 - 9 in Docket DE 09-180 was as follows:

38.4 percent was executed less than 6 months prior to contract delivery date
57.2 percent was executed between 6 and 9 months prior to contract delivery date
3.0 percent was executed between 9 and 12 months prior to contract delivery date
1.4 percent was executed greater than 12 months prior to contract delivery date
0 percent was executed greater than 15 months prior to contract delivery date

This schedule includes the firm bilateral strips made in January 2009 for August through November 2009.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-013
Page 1 of 1

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to OCA 1-4. Please quantify how PSNH accounted for the planned 4-week outage of Merrimack-2 that was scheduled to occur in the spring of 2009 in the determination of requested insurance proceeds regarding the fall turbine repair outage.

Response:
To account for the 4-week annual outage scheduled for 2009, in the replacement power calculation associated with the 18-week outage beginning August 1 and ending December 6, it was assumed that Merrimack Unit 2 would have taken its annual maintenance outage from September 18 through October 19. There were no replacement energy costs during that time period that were requested from the insurance company. See the responses to CLF-2, Q-005 and OCA-2, Q-001 for additional information concerning the insurance claims.

Public Service Company of New Hampshire	**Data Request STAFF-02**
Docket No. DE 10-121	**Dated: 08/13/2010**
	Q-STAFF-014
	Page 1 of 2

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to OCA 1-14. Please explain the variances between the budgeted capital expenditures and budgeted O&M expenses and the actual expenditures and expenses by the plants listed.

Response:
Attached is a discussion of the variances between budgeted and actual costs for both Capital and O&M.

2009	Budget	
	CAPITAL	**Variances**
Merrimack Station	$12.8M	Cancelled/postponed jobs (i.e. reclaim hoppers, coal handling vac, homeland security, etc.) (-$1.2M)
		ACI project - on-hold significantly reducing the budgeted cost of sorbents, etc. (-$2.2M)
		Number of projects coming in under budget(i.e. MK1 480V breakers and the 200 and 203 valves) (-$1.0M)
Schiller Station	$11.9M	Reduction in wood yard expansion work, as well as a number of other smaller project changes during the year. (-$0.8M)
Newington Station	$2.1M	Number of proposed capital projects cancelled/postponed(-$1.1M)
Hydro	$5.3M	FERC Site costs (-$500K), Jackman GSU (-$412K), other jobs postponed or under budget
	O&M	**Variances**
Merrimack Station	$39.1M	Mainly due to the lower cost of ammonia (-$3.6M)
Schiller Station	$19.0M	On-Budget, slightly less maintenance during the SR6 overhaul
Newington Station	$8.5M	Reduced scope during the overhaul consistent with the lower capacity factor, also less chemicals and contractor labor during the year. (-$1.3M)
Hydro	$5.5M	On-Budget

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-016

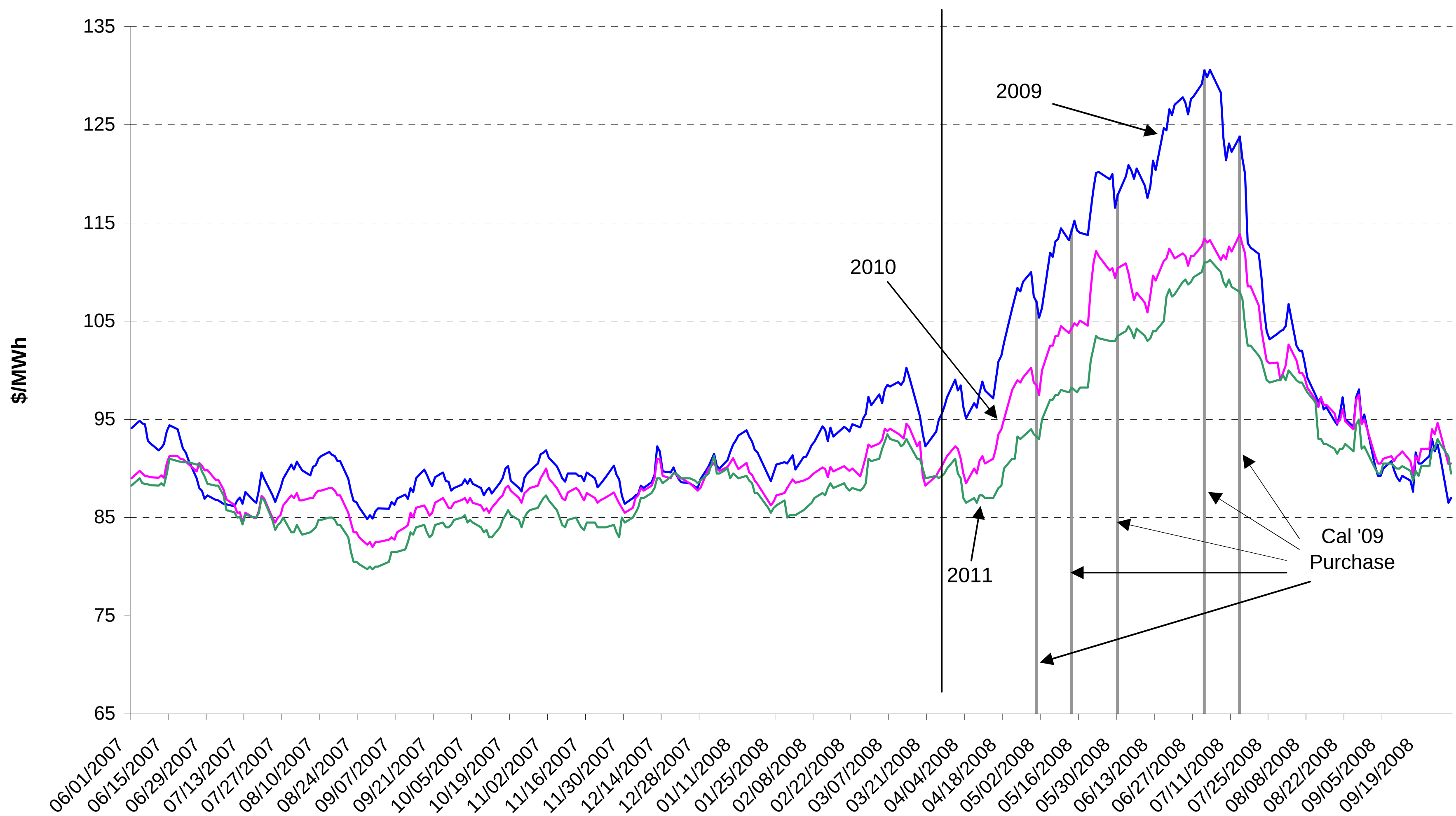
Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference responses to TC 1-2 and TC 1-14. Please explain why PSNH waited until July 2008 to start making the majority of its supplemental purchases when indications were that the market price for 2009 purchases was rising long before that time.

Response:
PSNH did not wait until July 2008 to start making the majority of its 2009 supplemental energy purchases. In total 1,762 GWhs of 2009 purchases were executed during 2008. 1,432 GWhs (81% of total) were calendar '09 purchases, of which 702 GWhs (40%) were purchased prior to 6/1/08. Although these purchases were made at market prices during a general upward price trend, they were made during temporary troughs over that time. The remaining 730 GWhs (41%) of calendar '09 purchases were made at market prices by 7/14/08, by which time a downward price trend had begun. The remaining 330 GWhs (19%) were made at market prices between July and November, 2008 during a general downward price trend. Thus, 1,032 GWh of the 1,762 GWh (59%) were made either before the continuing price run up in June 2008 or well after prices peaked in early July.

The attached graph shows forward annual peak energy prices from mid-spring 2007 through summer 2008. The vertical lines show the start of the supplemental purchase plan (April 1, 2008) and the days when calendar 2009 purchases were made. This graph is meant to be indicative of prices when the purchases were made and not what the purchase prices were as not all the purchases were peak strips or priced at the MA Hub.

NYMEX Daily Peak Period Prices for Calendar Year Electricity Delivered at the Massachusetts Hub



Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to CLF 1-6. How often does PSNH normally perform "subsequent iterations" of its supplemental energy purchase forecast in a typical year? How many subsequent iterations were performed for 2009 and when were they performed?

Response:
For 2009 ES supplemental energy requirements there were five (5) assessments that resulted in published target quantities: in April, early and late July, September, and December, 2008. The April and early July assessments resulted in requests for authorization to make purchases. The late July assessment revised targets downward as it incorporated new load information and did not result in a request for new purchases. The September and December assessments were part of the initial and final ES rate setting filings and served as status reports. The Assessments are not performed on a prescribed “normal” schedule. In addition to the iterations outlined above, informal ongoing conversations about supplemental power purchasing needs take place among NUSCO and PSNH staffs through the normal course of business.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-02

Dated: 08/13/2010
Q-STAFF-018
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Reference response to CLF 1-7. Given that reserve shutdowns began in 2009 for the Merrimack and Schiller units that were forecasted as running as baseload units for the purpose of supplemental energy purchases, please explain how those reserve shutdowns were reflected in purchasing decisions for 2009.

Response:
The supplemental energy purchase requirements analyses done throughout 2008 for 2009 invariably showed the Merrimack and Schiller units to be economic, so no reserve shutdowns were forecast and consequently supplemental energy purchases were less than would have otherwise been the case. No supplemental energy purchases were made during 2009 when the reserve shutdowns referenced occurred because energy prices were low during these periods and the units were available for economic dispatch had energy prices gone back up.

Witness: David A. Errichetti
Request from: New Hampshire Public Utilities Commission Staff

Question:
Reference response to TC 1-2. Consistent with the last sentence of the response, please provide the table including contracting parties and pricing information for 2009.

Response:
Please see the attached table for the requested information.

** The requested information is being filed under the Motion for Protective Order dated August 26, 2010.

CONFIDENTIAL

Standardized Contracts

Execution Date	Contracting Party	Duration	Size (MW)	Price ($/MWh)	Product
04/30/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 12/31/2009	50	$107.50	5X16
05/13/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 12/31/2009	50	$113.75	5X16
05/30/2008	H.Q. Energy Serv. (US) Inc.	01/01/2009 - 12/31/2009	50	$109.00	7X16
07/01/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 12/31/2009	50	$127.50	7X16
07/14/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 12/31/2009	50	$110.25	7X24
07/22/2008	Constellation Power Source	06/01/2009 - 06/30/2009	100	$100.50	5X16
07/22/2008	Constellation Power Source	09/01/2009 - 09/30/2009	100	$99.25	5X16
07/22/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 02/28/2009	100	$127.50	5X16
07/23/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 02/28/2009	50	$99.00	OFFPEAK
07/29/2008	PSEG Energy Resources & Trade	04/01/2009 - 04/30/2009	100	$74.00	OFFPEAK
08/07/2008	Constellation Power Source	04/01/2009 - 04/30/2009	50	$91.25	5X16
08/07/2008	FPL Energy Power Mktg. Inc.	01/01/2009 - 02/28/2009	50	$119.00	5X16
08/08/2008	FPL Energy Power Mktg. Inc.	07/01/2009 - 08/31/2009	50	$106.50	5X16
11/17/2008	FPL Energy Power Mktg. Inc.	04/01/2009 - 04/30/2009	100	$69.25	5X16
01/21/2009	FPL Energy Power Mktg. Inc.	01/22/2009 - 01/22/2009	50	$67.50	5X16
01/21/2009	FPL Energy Power Mktg. Inc.	01/23/2009 - 01/23/2009	100	$63.00	5X16
01/21/2009	Hess Corporation	01/22/2009 - 01/22/2009	50	$68.00	5X16
01/28/2009	Hess Corporation	01/30/2009 - 01/30/2009	100	$62.00	5X16
01/28/2009	Hess Corporation	01/29/2009 - 01/29/2009	200	$62.00	5X16
01/29/2009	FPL Energy Power Mktg. Inc.	01/30/2009 - 01/30/2009	100	$61.00	5X16
01/29/2009	FPL Energy Power Mktg. Inc.	08/01/2009 - 11/30/2009	200	$52.25	7X24
01/30/2009	Hess Corporation	01/31/2009 - 02/01/2009	50	$54.75	2X16
01/30/2009	Hess Corporation	01/31/2009 - 02/01/2009	50	$54.50	2X16
01/30/2009	Hess Corporation	02/02/2009 - 02/02/2009	150	$54.50	5X16
02/02/2009	Hess Corporation	02/03/2009 - 02/03/2009	100	$60.00	5X16
02/06/2009	FPL Energy Power Mktg. Inc.	02/10/2009 - 02/13/2009	100	$52.50	5X16
02/06/2009	FPL Energy Power Mktg. Inc.	02/09/2009 - 02/09/2009	100	$55.00	5X16
02/12/2009	FPL Energy Power Mktg. Inc.	02/13/2009 - 02/13/2009	200	$56.00	5X16
02/12/2009	FPL Energy Power Mktg. Inc.	02/14/2009 - 02/15/2009	200	$54.00	2X16
02/25/2009	FPL Energy Power Mktg. Inc.	02/26/2009 - 02/26/2009	100	$44.75	5X16
02/25/2009	FPL Energy Power Mktg. Inc.	02/27/2009 - 02/27/2009	100	$43.50	5X16
02/25/2009	FPL Energy Power Mktg. Inc.	02/26/2009 - 02/26/2009	150	$44.75	5X16
02/25/2009	FPL Energy Power Mktg. Inc.	02/27/2009 - 02/27/2009	150	$43.50	5X16
06/24/2009	Hess Corporation	06/27/2009 - 06/28/2009	300	$41.00	2X16
06/26/2009	Hess Corporation	06/29/2009 - 06/29/2009	200	$39.50	5X16
07/21/2009	Hess Corporation	07/22/2009 - 07/22/2009	300	$39.25	5X16
08/18/2009	Mirant Energy Trading, LLC	08/19/2009 - 08/19/2009	150	$57.50	5X16
08/20/2009	Mirant Energy Trading, LLC	08/21/2009 - 08/21/2009	150	$43.25	5X16
08/21/2009	H.Q. Energy Serv. (US) Inc.	08/22/2009 - 08/23/2009	150	$35.25	2X16
12/02/2009	FPL Energy Power Mktg. Inc.	12/03/2009 - 12/03/2009	200	$48.75	5X16
12/03/2009	Hess Corporation	12/04/2009 - 12/04/2009	150	$49.75	5X16

Structured and/or Unit-Contingent Contracts

Execution Date	Description	Duration	Size (MW)	Price ($/MWh)	Power Delivery Period
10/19/2007	Pinetree - Bethlehem & Tamworth	01/01/2008 - 12/31/2010	36	65.02	as produced

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-01

Dated: 07/16/2010
Q-OCA-004

Witness: **William H. Smagula**
Request from: **Office of Consumer Advocate**

Question:
Please explain PSNH's efforts since the Settlement in DE 09-091 to recover outage costs related to the replacement of the Merrimack Unit 2 turbine due to foreign material damage, whether from insurers or other Parties.

Response:
Two outages have been taken associated with the Merrimack 2 turbine foreign material event. The 3 week inspection outage taken in June/July 2008 occurred during the 60 day waiting period (deductible period). The maintenance (cleaning, inspecting, etc.) costs associated with this inspection outage have been submitted and fully reimbursed by the insurance company. The 18 week repair outage began August 1, 2009 and ended December 6, 2009. The replacement power costs associated with this 18 week outage have been submitted to the insurance company for reimbursement. Over 95% of the repair costs for this outage have been submitted. Final documentation for the last small portion is being assembled for submittal, while the insurance company continues to review the previously submitted documentation. The source of the foreign material remains under investigation by the insurance company and at this point no responsible 3rd party has been identified. PSNH continues to support the investigative efforts.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-01
Dated: 07/16/2010
Q-OCA-005
Page 1 of 1

Witness: William H. Smagula
Request from: Office of Consumer Advocate

Question:
Please provide a schedule showing the amount of costs and insurance proceeds in 2009 related to Replacement power, O & M, and Boiler/Machinery related to the Merrimack Unit 2 turbine outage due to foreign material damage.

Response:
Below is the amount of costs and insurance proceeds in 2009 specific to the boiler and machinery claim and the replacement power claim.

2009	Boiler and Machinery (O&M Costs)		Replacement Power Costs (RPC)	
Costs	$	18,016,085	$	10,843,635
Proceeds	$	10,000,000	$	-

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-01

Dated: 07/16/2010
Q-OCA-008
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Office of Consumer Advocate**

Question:
Page 7 (Bates p. 000068) of Mr. Smagula's testimony includes a discussion of the OR-2009-03 Merrimack Unit 2 planned outage of 4.6 days. Line 11 on that page refers to a "portable rental unit." Why does PSNH use a "rental unit" as opposed to owning the equipment? What is the lead time to acquire another "rental unit" as opposed to one PSNH owned?

Response:
An irreparable crack was found on the MK2 generator exciter rotor during an inspection performed as part of the planned 2008 annual outage. The lead time for a refurbished rotor would have been approximately 16 to 24 weeks. As a result, an available rental exciter was obtained to avoid a lengthy extension of the outage. This rental unit was replaced with a permanent exciter during the 2009 planned annual outage.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-01

Dated: 07/16/2010
Q-OCA-010
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Office of Consumer Advocate**

Question:
Page 2 of the response to Staff 01-002 shows negative Replacement Power Costs (RPC) related to several outage dates. Please explain. For example, why would Merrimack Unit I have been dispatched on 7/21/09 and 7/22/09 if the RPC was lower than the Avoided Fuel Costs?

Response:
For the coal units in the first pass at estimating replacement power costs there are a number of reasons why it makes sense to leave the unit running when the unit is placed back in-service even though it would appear, in hindsight, to be an uneconomic option in some hours. These reasons include:
1) Day ahead bilateral energy prices which signal projected system load, potential unit outages, fuel supply infrastructure upsets among other factors support not backing down or cycling the unit;
2) Unit operational conditions that factor into the dispatch decision argue for not backing down or cycling the unit. These conditions include equipment status, minimum load values, duration of possible reduced load operation, coal type being burned, and shut-down and start-up time durations; and
3) Managing fuel both in the bunkers and yard as well as projected deliveries and expected inventory support not backing down or cycling the unit.

Public Service Company of New Hampshire	**Data Request OCA-01**
Docket No. DE 10-121	**Dated: 07/16/2010**
	Q-OCA-011
	Page 1 of 1

Witness:	**Robert A. Baumann**
Request from:	**Office of Consumer Advocate**

Question:

The response to Staff 01-004 shows the coal inventory adjustments dated 5/20/09 and 10/29/09 as $5,047,780 and $986,510 respectively. Footnote 2 on Attachment RAB-4 page 8 indicates that the adjustments weren't booked until August and December 2009. Please provide the reduction to carrying costs had the adjustments been recognized for ES purposes as of 5/20/09 and 10/29/09 respectively.

Response:

The physical to book inventory adjustments were booked as soon as the results were known. As noted below, the coal inventory process is quite complex and takes about 2-3 months before the results are known.

The physical coal inventory is performed by PSNH Generation with the assistance by a vendor, L. R. Kimball & Associates. The services provided by Kimball include density testing, moisture content, obtaining ground survey of fly-over services, obtaining adequate support assistance for the actual audit and issuing a report of all findings. Kimball normally takes 1-2 months to translate the aerial photos, ground survey, density and moisture data and provides the coal tonnage results to PSNH. At that time, PSNH needs to review the report and make any necessary adjustments, such as coal in route that is reflected in the book inventory but which was not part of the physical inventory and to investigate any other discrepancies. As soon as the results are received by the Fuel Accounting Department, they are reviewed and compared to the book inventories and the appropriate adjustment is booked within a couple of days.

The coal physical versus book inventory journal entry recorded on PSNH's books in August and December 2009 increased both the fuel inventory and the deferred regulatory obligation accounts by $5.0 and 1.0 million respectively. Customers have received a benefit in that the coal prematurely expensed would have been included in rate base, thus earning a return, over the two month period between when the physical inventory was taken and when it was booked. The return on rate base is calculated using PSNH's weighted average cost of capital, including an allowed ROE of 9.81%. The ES over/under recovery deferral earns a return at the Prime Rate of 3.25%, which results in a lower return over the time period. Therefore, the delay in recognizing the physical inventory results by about two months resulted in lower overall carrying costs to customers in the ES, as the prime rate is lower then the allowed return on rate base.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-01

Dated: 07/16/2010
Q-OCA-012

Witness: **David A. Errichetti,William H. Smagula**
Request from: **Office of Consumer Advocate**

Question:
Staff 01-007 requested Newington Station cost and revenue information for 2008. Please provide similar information for 2009.

Response:
Even though Staff-01, Q-Staff-007 asked for 2008, PSNH provided 2009 data in its response. Please see the response to Staff-01, Q-Staff-007 for the requested information.

Public Service Company of New Hampshire	**Data Request OCA-01**
Docket No. DE 10-121	**Dated: 07/16/2010**
	Q-OCA-013
	Page 1 of 1

Witness: **David A. Errichetti,Robert A. Baumann**
Request from: **Office of Consumer Advocate**

Question:
In the response to Staff 01-021, PSNH compared the variable costs/kWh for its own generation with ISO spot market prices. Please recreate the Table to include the total cost/kWh for PSNH's own generation. The total cost should include O&M, depreciation, taxes, return, etc. Please explain if capacity values and costs should also be recognized on either or both sides of the comparison for purposes of consistency. If yes, please include those values/costs.

Response:
PSNH does not maintain the total cost information requested above in the cents/kWh format requested. Moreover, the analysis requested would require speculation regarding the monthly allocation of the various price components specified in the question. Because of the foregoing concerns with respect to cost allocation, PSNH can not perform a valid analysis for the selected months identified.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-01
Dated: 07/16/2010
Q-OCA-014
Page 1 of 2

Witness: William H. Smagula
Request from: Office of Consumer Advocate

Question:
Staff data requests 44 and 45 in Set 1 requested that information be provided for review at PSNH's Manchester office. Please also provide this information electronically.

Response:
Staff-1 Q-Staff-044 requested the capital and O&M budgets for Merrimack, Schiller and Newington Stations and the hydro units and combustion turbines. With the recent Commission order defining the scope of this proceeding, this request is outside of the scope; therefore, PSNH respectively declines to provide this information electronically. However, the OCA and the PUC staff may review this information at Energy Park.

Staff-1 Q-Staff-045 requested the 2009 budgeted and actual capital and O&M expenditures for Merrimack, Schiller and Newington Stations and the hydro units and combustion turbines.

Below is the 2009 Capital budgeted and actual expenditures.

GENERATION SUMMARY
As of YTD December 2009

		YTD ACTUALS
MERRIMACK STATION*	BUDGET	12,800.2
	ACTUAL	8,379.0
	VARIANCE	-4,421.2
SCHILLER STATION	BUDGET	11,922.5
	ACTUAL	11,432.6
	VARIANCE	-489.9
NEWINGTON STATION	BUDGET	2,142.8
	ACTUAL	1,012.9
	VARIANCE	-1,129.9
HYDRO	BUDGET	5,265.1
	ACTUAL	3,333.1
	VARIANCE	-1,932.0
Total GENERATION	BUDGET	32,496.9
	ACTUAL	24,304.5
	VARIANCE	-8,192.5

*(Excluding CLEAN AIR PROJECT)

This second table provides the 2009 budgeted and actual O&M expenditures for Merrimack, Schiller and Newington Stations separately and the hydro units and combustion turbines as a group.

December 2009 O&M		YEAR-TO-DATE			
Station		**Budget (Latest Approved**	**Actual**	**Over/ (Under) Budget**	**Percent** Over/Under **Budget**
		($000)	($000)	($000)	
Merrimack		39,153	35,528	(3,625)	-9.3%
Schiller		18,986	18,788	(198)	-1.0%
Newington		8,509	7,198	(1,311)	-15.4%
Hydro		5,534	5,468	(66)	-1.2%

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-02

Dated: 08/13/2010
Q-OCA-001

Witness: **William H. Smagula**
Request from: **Office of Consumer Advocate**

Question:
Referencing OCA 01-004 and 005, please provide the total costs, net of insurance proceeds, included in this filing related to the 18 week outage of August 1, 2009 - December 6, 2009. For what portion of these costs is PSNH seeking insurance recovery? What is the status of those recoveries?

Response:
Costs related to the MK 2 18-week outage include the routine station annual outage maintenance costs, the turbine repair costs, and the incremental outage replacement energy costs. The costs and their status are below.

MK2 annual outage maintenance costs $9.0 M
These costs are not associated with the turbine repair and therefore not part of the insurance claim.

MK2 turbine repair costs $18.0M
100% of these costs are part of the insurance claim. To date, $10M has been received.

Replacement energy costs $7.2M
100% of these cost are part of the insurance claim.

The insurance company remains in the review process. It is expected that reimbursement will be made after the final settlement is determined.

Public Service Company of New Hampshire | **Data Request OCA-02**
Docket No. DE 10-121 | **Dated: 08/13/2010**
Q-OCA-008
Page 1 of 1

Witness: David A. Errichetti,Robert A. Baumann
Request from: Office of Consumer Advocate

Question:
In the response to Staff 01-021, PSNH compared the variable costs/kWh for its own generation with ISO spot market prices. Please recreate the Table to include the total cost/kWh (fixed and variable costs) for each of PSNH's fossil units on an annual basis for 2009 compared to the average ISO spot market price for 2009. Please explain if capacity values and costs should also be recognized in either or both sides of the comparison for purposes of consistency. If so, please include those values/costs.

Response:
PSNH does not maintain fixed and all variable costs on a unit specific basis. Moreover, the analysis requested would require arbitrary speculation regarding the monthly allocation of various cost components that PSNH does not perform. In any attempt to do so, shared costs such as accounting, human resources and planning, would need to be allocated to stations and shared station costs would need to be allocated to units. In addition, ISO spot market costs for capacity and energy are only a subset of the costs of serving full requirements load which includes costs such as ISO-NE expenses, operating reserves, forward reserves, management of load and price uncertainty, and profit.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-02

Dated: 08/13/2010
Q-OCA-010

Witness: **David A. Errichetti,Robert A. Baumann**
Request from: **Office of Consumer Advocate**

Question:
Please expand the response to Staff 01-021 to include similar information related to total costs to customers and market prices for each month of 2009 for each generating plant.

Response:
Please find below the response to Staff-01, Q-Staff-021 expanded to include similar information related to total costs to customers for each month of 2009. PSNH does not maintain fixed and all variable costs on a unit specific basis.

	Own Generation	Variable Costs		Cost at DA LMPs		Savings from Own Generation	
	MWh	$000	¢/kWh	$000	¢/kWh	$000	¢/kWh
Jan-09	520,095	25,106	4.83	36,352	6.99	11,246	2.16
Feb-09	349,436	15,805	4.52	17,096	4.89	1,291	0.37
Mar-09	437,688	17,870	4.08	17,793	4.07	(77)	(0.02)
Apr-09	341,389	14,266	4.18	11,293	3.31	(2,973)	(0.87)
May-09	352,314	13,119	3.72	12,124	3.44	(995)	(0.28)
Jun-09	349,671	14,763	4.22	11,698	3.35	(3,065)	(0.88)
Jul-09	365,643	14,191	3.88	11,648	3.19	(2,543)	(0.70)
Aug-09	188,750	3,552	1.88	6,808	3.61	3,256	1.73
Sep-09	132,901	6,166	4.64	3,786	2.85	(2,380)	(1.79)
Oct-09	162,060	8,373	5.17	6,561	4.05	(1,812)	(1.12)
Nov-09	203,900	8,981	4.40	7,572	3.71	(1,409)	(0.69)
Dec-09	398,172	16,485	4.14	23,109	5.80	6,624	1.66
Total	3,802,017	158,677	4.17	165,841	4.36	7,164	0.19

Variable costs are sum of Fossil Energy costs and RGGI costs, lines 29 and 40 of Attachment RAB-3 page 1 of 2 and 2 of 2

In preparing this response it was determined that in Staff-01, Q-Staff-021 the generation data for a couple of units did not reflect the last set of ISO-NE 90 day true ups and that the hourly day-ahead LMPs for a few units were incorrect. Staff-01, Q-Staff-021 will be supplemented to show the values in the table above.

Witness: **Stephen R. Hall**
Request from: **Office of Consumer Advocate**

Question:
Please provide both the out-migration to competitive suppliers and the in-migration back to default service for PSNH on a monthly basis for each month in 2009.

Response:
Attached are the quarterly migration reports PSNH has filed with the Commission since 2009. As of the third quarter of 2009, PSNH stopped tracking the number of customers who returned to default service. Tracking that number was a manual calculation, and with the increase in migration activity, it became very time consuming to provide that information (see cover letter dated November 3, 2009).

Public Service of New Hampshire

PSNH Energy Park
780 N. Commercial Street, Manchester, NH 03101

Public Service Company of New Hampshire
P.O. Box 330
Manchester, NH 03105-0330
(603) 669-4000
www.psnh.com

The Northeast Utilities System

July 31, 2009

Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, New Hampshire 03301-2429

Re: 2nd Quarter 2009 Customer Migration Report and
Revised 1st Quarter 2009 Customer Migration Report

Dear Ms. Howland:

In its Order No. 24,714 – Order Approving Energy Service Rate in Docket DE 06-125, the Commission directed PSNH to provide monthly data regarding the migration of its customers to the competitive market on a quarterly basis. Enclosed for filing with the Commission is a Customer Migration Report for the 2nd quarter of 2009 and a revised Customer Migration Report for the 1st quarter of 2009. The Customer Migration Report for the 1st quarter of 2009 filed on April 14, 2009 incorrectly reported the estimated demand at the time of PSNH's system peak in megawatts rather than in kilowatts. The revised 1st Quarter 2009 report correctly states the demand at the time of PSNH's system peak in kilowatts. These reports are being filed electronically with one paper copy being sent to the Commission.

We would be pleased to respond to any questions the Commission may have on this report.

Sincerely,

Rhonda J Bisson

Rhonda J. Bisson
Senior Analyst

RJB:kn
Enclosures
cc: M.A.Hatfield, OCA

Public Service Company of New Hampshire
Migration of Customers To and From the Competitive Energy Supply Market
1st Quarter 2009 Report (Revised)
to the New Hampshire Public Utilities Commission

	Customers Receiving Energy Service From the Competitive Market				
	Number of Customers Not Billed for PSNH's Energy Service	Total Kilowatt-hours Delivered (KWH)	Estimated Demand at the Time of PSNH's System Peak Reported to the ISO-NE (KW)	Number of Customers Entering the Competitive Market Based on Enrollment Transactions	Number of Customers Returning to PSNH's Energy Service Based on Drop Transactions
January					
Residential	20	10,286		0	0
Small C&I Rate G	109	658,934		50	2
Medium C&I Rate GV	82	11,936,926		35	2
Large C&I Rate LG	39	37,797,140		10	1
Lighting	1	476,440		1	0
Total	**251**	**50,879,726**	**119,332**	**96**	**5**
February					
Residential	20	13,576		0	0
Small C&I Rate G	156	1,442,553		35	0
Medium C&I Rate GV	115	18,572,968		39	2
Large C&I Rate LG	50	53,212,491		3	0
Lighting	2	397,499		2	0
Total	**343**	**73,639,087**	**118,074**	**79**	**2**
March					
Residential	20	10,838		0	0
Small C&I Rate G	197	1,975,813		9	0
Medium C&I Rate GV	153	21,047,270		17	2
Large C&I Rate LG	52	50,662,014		2	0
Lighting	3	381,595		0	0
Total	**425**	**74,077,530**	**91,121**	**28**	**2**

Date: 07/31/2009

Public Service Company of New Hampshire
Migration of Customers To and From the Competitive Energy Supply Market
2nd Quarter 2009 Report
to the New Hampshire Public Utilities Commission

	Customers Receiving Energy Service From the Competitive Market				
	Number of Customers Not Billed for PSNH's Energy Service	Total Kilowatt-hours Delivered (KWH)	Estimated Demand at the Time of PSNH's System Peak Reported to the ISO-NE (KW)	Number of Customers Entering the Competitive Market Based on Enrollment Transactions	Number of Customers Returning to PSNH's Energy Service Based on Drop Transactions
April					
Residential	20	9,902		0	1
Small C&I Rate G	205	2,248,608		112	1
Medium C&I Rate GV	168	24,618,145		43	0
Large C&I Rate LG	54	55,311,032		8	0
Lighting	4	336,258		0	0
Total	**451**	**82,523,945**	**169,079**	**163**	**2**
May					
Residential	20	9,289		0	0
Small C&I Rate G	322	3,684,807		116	0
Medium C&I Rate GV	211	29,497,750		34	0
Large C&I Rate LG	62	58,721,165		5	0
Lighting	9	276,139		0	0
Total	**624**	**92,189,150**	**188,518**	**155**	**0**
June					
Residential	19	5,177		5	1
Small C&I Rate G	462	5,044,609		772	1
Medium C&I Rate GV	245	31,765,232		61	3
Large C&I Rate LG	67	64,284,890		4	3
Lighting	12	304,059		4	0
Total	**805**	**101,403,967**	**215,064**	**846**	**8**

Date: 07/31/2009

November 3, 2009

Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, New Hampshire 03301-2429

Re: 3rd Quarter 2009 Customer Migration Report

Dear Secretary Howland:

In its Order No. 24,714 – Order Approving Energy Service Rate in Docket DE 06-125, the Commission directed PSNH to provide monthly data regarding the migration of its customers to the competitive market on a quarterly basis. Enclosed for filing with the Commission is a Customer Migration Report for the 3rd quarter of 2009. Due to the increased volume in the number of customers receiving energy service from the competitive market, PSNH will no longer include in this report the number of customers entering the competitive market based on enrollment transactions and the number of customers returning to PSNH's energy service based on drop transactions. Determining the number of customers by rate category based on enrollment and drop transactions is currently a manual process that would take a considerable effort to either continue or to automate. PSNH will continue to include the number of customers and kilowatt-hours delivered to customers receiving energy service from the competitive market by rate category based on reports generated by PSNH's billing system, since this information is readily available from existing reports. This data meets the Commission's directive to PSNH to report the level of migration to the competitive energy market by rate category and month on a quarterly basis. This report is being filed electronically with one paper copy being sent to the Commission.

We would be pleased to respond to any questions the Commission may have on this report.

Sincerely,

Rhonda J. Bisson
Senior Analyst

RJB:kn
Enclosures
cc: Meredith A. Hatfield, OCA

Public Service Company of New Hampshire
Migration of Customers To and From the Competitive Energy Supply Market
3rd Quarter 2009 Report
to the New Hampshire Public Utilities Commission

	Customers Receiving Energy Service From the Competitive Market		
	Number of Customers	Total Kilowatt-hours Delivered (KWH)	Estimated Demand at the Time of PSNH's System Peak Reported to the ISO-NE (KW)
July			
Residential	65	22,602	
Small C&I Rate G	1,252	8,091,707	
Medium C&I Rate GV	305	40,781,210	
Large C&I Rate LG	68	69,434,107	
Lighting	22	311,265	
Total	**1,712**	**118,640,891**	**258,726**
August			
Residential	345	145,136	
Small C&I Rate G	1,634	11,152,388	
Medium C&I Rate GV	339	52,504,755	
Large C&I Rate LG	71	81,239,355	
Lighting	39	351,000	
Total	**2,428**	**145,392,634**	**352,436**
September			
Residential	506	209,276	
Small C&I Rate G	1,907	12,611,250	
Medium C&I Rate GV	425	60,445,879	
Large C&I Rate LG	72	78,425,471	
Lighting	25	468,482	
Total	**2,935**	**152,160,358**	**235,655**

Date: 11/03/2009

Public Service of New Hampshire

PSNH Energy Park
780 North Commercial Street, Manchester, NH 03101

Public Service Company of New Hampshire
P.O. Box 330
Manchester, NH 03105-0330
(603) 669-4000
www.psnh.com

The Northeast Utilities System

February 2, 2010

Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, New Hampshire 03301-2429

Re: 4th Quarter 2009 Customer Migration Report

Dear Ms. Howland:

In its Order No. 24,714 - Order Approving Energy Service Rate in Docket DE 06-125, the Commission directed PSNH to provide monthly data regarding the migration of its customers to the competitive market on a quarterly basis. Enclosed for filing with the Commission is a Customer Migration Report for the 4th quarter of 2009. This report is being filed electronically with one paper copy being sent to the Commission.

We would be pleased to respond to any questions the Commission may have on this report.

Sincerely,

Rhonda J. Bisson

Rhonda J. Bisson
Senior Analyst

RJB:kn
Enclosures
cc: Meredith A. Hatfield, OCA

OS6161 REV. 3-02

Public Service Company of New Hampshire
Migration of Customers To and From the Competitive Energy Supply Market
4th Quarter 2009 Report
to the New Hampshire Public Utilities Commission

	Customers Receiving Energy Service From the Competitive Market		
	Number of Customers Not Billed for PSNH's Energy Service	Total Kilowatt-hours Delivered (KWH)	Estimated Demand at the Time of PSNH's System Peak Reported to the ISO-NE (KW)
October			
Residential	493	230,068	
Small C&I Rate G	2,130	13,404,093	
Medium C&I Rate GV	473	60,504,915	
Large C&I Rate LG	74	82,073,699	
Lighting	27	558,480	
Total	**3,197**	**156,771,255**	**224,634**
November			
Residential	549	259,286	
Small C&I Rate G	2,410	14,624,144	
Medium C&I Rate GV	517	60,692,483	
Large C&I Rate LG	79	79,349,745	
Lighting	36	660,860	
Total	**3,591**	**155,586,518**	**235,168**
December			
Residential	555	326,869	
Small C&I Rate G	2,900	17,148,437	
Medium C&I Rate GV	544	65,033,951	
Large C&I Rate LG	82	87,791,990	
Lighting	48	741,765	
Total	**4,129**	**171,043,012**	**264,334**

Date: 02/02/2010

Public Service of New Hampshire

PSNH Energy Park
780 North Commercial Street, Manchester, NH 03101

Public Service Company of New Hampshire
P.O. Box 330
Manchester, NH 03105-0330
(603) 669-4000
www.psnh.com

The Northeast Utilities System

April 23, 2010

Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, New Hampshire 03301-2429

Re: 1st Quarter 2010 Customer Migration Report

Dear Ms. Howland:

In its Order No. 24,714 - Order Approving Energy Service Rate in Docket DE 06-125, the Commission directed PSNH to provide monthly data regarding the migration of its customers to the competitive market on a quarterly basis. Enclosed for filing with the Commission is a Customer Migration Report for the 1st quarter of 2010. This report is being filed electronically with one paper copy being sent to the Commission.

We would be pleased to respond to any questions the Commission may have on this report.

Sincerely,

Rhonda J. Bisson

Rhonda J. Bisson
Senior Analyst

RJB:kn
Enclosures
cc: Meredith A. Hatfield, OCA

OS6161 REV. 3-02

Public Service Company of New Hampshire
Migration of Customers To and From the Competitive Energy Supply Market
1st Quarter 2010 Report
to the New Hampshire Public Utilities Commission

	Customers Receiving Energy Service From the Competitive Market		
	Number of Customers Not Billed for PSNH's Energy Service	Total Kilowatt-hours Delivered (KWH)	Estimated Demand at the Time of PSNH's System Peak Reported to the ISO-NE (KW)
January			
Residential	678	380,113	
Small C&I Rate G	3,072	19,246,250	
Medium C&I Rate GV	548	75,700,226	
Large C&I Rate LG	83	78,209,489	
Lighting	71	977,547	
Total	**4,452**	**174,513,625**	**277,261**
February			
Residential	1,136	492,275	
Small C&I Rate G	3,259	20,457,577	
Medium C&I Rate GV	553	71,873,697	
Large C&I Rate LG	84	82,073,056	
Lighting	47	795,989	
Total	**5,079**	**175,692,594**	**268,061**
March			
Residential	1,181	448,687	
Small C&I Rate G	3,883	20,937,799	
Medium C&I Rate GV	596	71,551,515	
Large C&I Rate LG	86	83,591,867	
Lighting	54	764,590	
Total	**5,800**	**177,294,458**	**268,630**

Date: 04/22/2010

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request OCA-02

Dated: 08/13/2010
Q-OCA-012
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Office of Consumer Advocate**

Question:
Referencing the response to TC 01-002, for the first 14 contracts listed, as well as the 21st and the last one, please provide what the price/MWh would have been if the execution date had been the day prior to the start of the supply commitment.

Response:
Please find the requested information below.

Standardized Contracts

Execution Date	Contracting Party	Duration			Size (MW)	Price if Executed on Last Trading Day Prior to Period ($/MWh)	Product	
04/30/2008		01/01/2009	-	12/31/2009	50	$68.86	5X16	
05/13/2008		01/01/2009	-	12/31/2009	50	$68.86	5X16	
05/30/2008		01/01/2009	-	12/31/2009	50	$67.09	7X16	*
07/01/2008		01/01/2009	-	12/31/2009	50	$67.09	7X16	*
07/14/2008		01/01/2009	-	12/31/2009	50	$61.34	7X24	*
07/22/2008		06/01/2009	-	06/30/2009	100	$41.84	5X16	
07/22/2008		09/01/2009	-	09/30/2009	100	$31.25	5X16	
07/22/2008		01/01/2009	-	02/28/2009	100	$73.73	5X16	
07/23/2008		01/01/2009	-	02/28/2009	50	$61.78	OFFPEAK	
07/29/2008		04/01/2009	-	04/30/2009	100	$34.30	OFFPEAK	
08/07/2008		04/01/2009	-	04/30/2009	50	$41.30	5X16	
08/07/2008		01/01/2009	-	02/28/2009	50	$73.73	5X16	
08/08/2008		07/01/2009	-	08/31/2009	50	$43.16	5X16	
11/17/2008		04/01/2009	-	04/30/2009	100	$41.30	5X16	
01/29/2009		08/01/2009	-	11/30/2009	200	$37.47	7X24	*

Structured and/or Unit-Contingent Contracts

Execution Date	Description	Duration			Size (MW)		Power Delivery Period
10/19/2007		01/01/2008	-	12/31/2010	36	$79.26	as produced

Note
* These products are not explicitly priced. The represented prices are calculated based on closing Peak and Off-Peak prices.

Witness: David A. Errichetti
Request from: Office of Consumer Advocate

Question:
Referencing the response to TC 01-002, please add 2 additional columns with the first one showing the total MWhs acquired under each contract, and the second column showing the total amount paid by PSNH.

Response:
Attached, please find the requested information.
** The requested information is being filed under the Motion for Protective Order dated August 26, 2010.

Standardized Contracts

Execution Date	Contracting Party	Duration	Size (MW)	Price ($/MWh)	Product	MWhs	Cost ($000)
04/30/2008		01/01/2009 - 12/31/2009	50		5X16	204,800	$22,016
05/13/2008		01/01/2009 - 12/31/2009	50		5X16	204,800	$23,296
05/30/2008		01/01/2009 - 12/31/2009	50		7X16	292,000	$31,828
07/01/2008		01/01/2009 - 12/31/2009	50		7X16	292,000	$37,230
07/14/2008		01/01/2009 - 12/31/2009	50		7X24	438,000	$48,290
07/22/2008		06/01/2009 - 06/30/2009	100		5X16	35,200	$3,538
07/22/2008		09/01/2009 - 09/30/2009	100		5X16	33,600	$3,335
07/22/2008		01/01/2009 - 02/28/2009	100		5X16	65,600	$8,364
07/23/2008		01/01/2009 - 02/28/2009	50		OFFPEAK	38,000	$3,762
07/29/2008		04/01/2009 - 04/30/2009	100		OFFPEAK	36,800	$2,723
08/07/2008		04/01/2009 - 04/30/2009	50		5X16	17,600	$1,606
08/07/2008		01/01/2009 - 02/28/2009	50		5X16	32,800	$3,903
08/08/2008		07/01/2009 - 08/31/2009	50		5X16	35,200	$3,749
11/17/2008		04/01/2009 - 04/30/2009	100		5X16	35,200	$2,438
01/21/2009		01/22/2009 - 01/22/2009	50		5X16	800	$54
01/21/2009		01/23/2009 - 01/23/2009	100		5X16	1,600	$101
01/21/2009		01/22/2009 - 01/22/2009	50		5X16	800	$54
01/28/2009		01/30/2009 - 01/30/2009	100		5X16	1,600	$99
01/28/2009		01/29/2009 - 01/29/2009	200		5X16	3,200	$198
01/29/2009		01/30/2009 - 01/30/2009	100		5X16	1,600	$98
01/29/2009		08/01/2009 - 11/30/2009	200		7X24	585,800	$30,608
01/30/2009		01/31/2009 - 02/01/2009	50		2X16	1,600	$88
01/30/2009		01/31/2009 - 02/01/2009	50		2X16	1,600	$87
01/30/2009		02/02/2009 - 02/02/2009	150		5X16	2,400	$131
02/02/2009		02/03/2009 - 02/03/2009	100		5X16	1,600	$96
02/06/2009		02/10/2009 - 02/13/2009	100		5X16	6,400	$336
02/06/2009		02/09/2009 - 02/09/2009	100		5X16	1,600	$88
02/12/2009		02/13/2009 - 02/13/2009	200		5X16	3,200	$179
02/12/2009		02/14/2009 - 02/15/2009	200		2X16	6,400	$346
02/25/2009		02/26/2009 - 02/26/2009	100		5X16	1,600	$72
02/25/2009		02/27/2009 - 02/27/2009	100		5X16	1,600	$70
02/25/2009		02/26/2009 - 02/26/2009	150		5X16	2,400	$107
02/25/2009		02/27/2009 - 02/27/2009	150		5X16	2,400	$104
06/24/2009		06/27/2009 - 06/28/2009	300		2X16	9,600	$394
06/26/2009		06/29/2009 - 06/29/2009	200		5X16	3,200	$126
07/21/2009		07/22/2009 - 07/22/2009	300		5X16	4,800	$188
08/18/2009		08/19/2009 - 08/19/2009	150		5X16	2,400	$138
08/20/2009		08/21/2009 - 08/21/2009	150		5X16	2,400	$104
08/21/2009		08/22/2009 - 08/23/2009	150		2X16	4,800	$169
12/02/2009		12/03/2009 - 12/03/2009	200		5X16	3,200	$156
12/03/2009		12/04/2009 - 12/04/2009	150		5X16	2,400	$119

Structured and/or Unit-Contingent Contracts

Execution Date	Description	Duration	Size (MW)	Price ($/MWh)	Power Delivery Period	MWhs	Cost ($000)
10/19/2007		01/01/2008 - 12/31/2010	36		as produced	289,499	$18,823

Public Service Company of New Hampshire
Docket No. DE 10-121

Technical Session TECH-01

Dated: 09/09/2010
Q-TS-001

Witness: **William H. Smagula**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please reconcile the forecasted capacity factors in STAFF-01, Q-STAFF-008, Supplement 1 with the capacity factors appearing in Bill Smagula's testimony.

Response:
Attached are 3 tables providing the capacity factors for years 2001 through 2008. The information in Table 1 is provided in William Smagula's testimony (Attachment WHS-3, Steam Plant Graphs- Planned outages omitted). The information in Table 2, which was included in the response to STAFF-01, Q-STAFF-008, Supplement 1, was used to forecast the Energy Service assumptions for unit operations at Merrimack and Schiller Stations.

During the review of this data, a small number of differences was identified. These differences occurred due to errors in cell equations or, in a few instances in earlier years, due to different treatment of planned maintenance outages. These errors did not result in any significant difference to the final average capacity factors between outages as shown in Table 3, which corrects the data in Table 2.

Finally, it should be noted the Schiller 5 capacity factor averages consider the re-powering of the boiler at the end of 2006.

Table 1

	2000	2001	2002	2003	2004	2005	2006	2007	2008	avg
MK1		92.9	91.4	93.3	95.3	90.6	87.2	95.7	92.3	**92.34**
Mk2		83.1	84.7	80.0	88.0	86.2	92.6	91.6	84.6	**86.35**
SR4		71.5	72.5	82.0	81.6	80.6	78.5	84.2	82.0	**79.10**
SR5		61.9	73.8	76.4	76.4	72.4	65.6	82.5	82.0	**73.88**
SR6		67.8	76.3	82.8	85.3	83.5	77.8	82.9	84.3	**80.08**

Table 1 contains the data used to create the charts in WHS-3, Capacity factor between planned outages.

Table 2

	2000	2001	2002	2003	2004	2005	2006	2007	2008	avg
MK1	84.3	88.5	90.0	93.3	97.6	90.6	86.9	95.7	94.1	**91.2**
MK2	73.8	81.6	84.7	87.8	88.7	86.2	92.7	92.8	80.5	**85.4**
SR4	74.2	71.7	70.7	81.8	82.4	80.6	70.0	84.2	85.3	**77.9**
SR5								79.8	76.2	**78.0**
SR6	75.7	69.0	77.1	82.8	85.4	83.5	78.0	83.0	78.5	**79.2**

Table 2 is the data used to determine the between outage capacity factor used to forecast Energy Service assumption.

Table 3

	2000	2001	2002	2003	2004	2005	2006	2007	2008	avg
MK1	84.3	92.9	91.4	93.3	95.3	90.6	87.2	95.7	92.3	**91.4**
MK2	73.8	83.1	84.7	87.8	88.0	86.2	92.6	91.5	84.7	**85.8**
SR4	74.2	71.5	75.6	81.3	81.6	80.6	81.6	84.2	82.0	**79.2**
SR5								82.5	81.9	**82.2**
SR6	75.7	67.8	76.3	82.8	85.3	83.5	77.6	82.9	84.3	**79.6**

Table 3 is an updated version of Table 2 with cells corrected.

Note Schiller Unit 5 considers the repowering of the boiler at the end of 2006.

Public Service Company of New Hampshire
Docket No. DE 10-121

Technical Session TECH-01

Dated: 09/09/2010
Q-TS-002

Witness: **Erica L. Menard,Robert A. Baumann**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Re: STAFF-02, Q-STAFF-006, why doesn't PSNH make an adjustment for recent economic events and use that information to forecast short-term sales?

Response:
The premise to this question is incorrect. PSNH uses the latest available economic forecast when developing the energy sales forecast. These sales forecasts are then used as one of the important reference points in PSNH's operational decision making processes. Those operational processes do take into account recent economic events if warranted in each individual circumstance.

Public Service Company of New Hampshire
Docket No. DE 10-121

Technical Session TECH-01

Dated: 09/09/2010
Q-TS-003

Witness: **Erica L. Menard,David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Taking into account more recent information discussed in the previous question, would PSNH’s purchases during 2009 have been any different?

Response:
The attachment shows the differences between sequential sales forecasts covering the period through the end of 2008. But for the last set of differences, these changes were captured in the supplemental ES energy purchase process for 2009. In view of the small differences between the last two forecasts, it is unlikely that PSNH's Supplemental ES energy purchases would have been different.

Comparison of Sequential Sales Forecasts as a Guage on ES Supplemental Energy Requirements

Release Date		Residential Sales MWh	Commercial Sales MWh	Industrial Sales MWh	Street Lighting Sales MWh	Total Retail Sales MWh	Change from Prior Forecast MWh	MWh/hr	Comment
October 25, 2007	JAN	325,837	298,149	116,248	2,630	742,864			used in initial
	FEB	279,786	286,589	108,647	2,251	677,274			assessment
	MAR	283,019	289,595	125,269	2,104	699,987			through late July
	APR	245,057	276,586	119,305	1,886	642,834			
	MAY	236,436	271,185	129,425	1,636	638,682			
	JUN	255,917	280,543	129,947	1,526	667,933			
	JUL	302,926	311,773	136,979	1,619	753,297			
	AUG	303,234	321,799	140,603	1,782	767,417			
	SEP	257,253	296,534	134,084	2,053	689,924			
	OCT	263,310	293,581	137,296	2,280	696,467			
	NOV	270,761	283,299	129,648	2,372	686,080			
	DEC	311,075	296,229	121,489	2,633	731,427			
	TOTAL	3,334,613	3,505,861	1,528,939	24,774	8,394,186			
May 13, 2008	JAN	319,877	299,402	114,923	2,622	736,824	(6,040)	(8)	used in late July
	FEB	268,186	282,814	106,251	2,253	659,504	(17,770)	(26)	assessment and
	MAR	277,102	287,670	123,620	2,096	690,488	(9,499)	(13)	initial ES rate
	APR	237,999	275,729	116,967	1,872	632,567	(10,267)	(14)	setting filing
	MAY	234,514	275,534	127,330	1,588	638,966	284	0	
	JUN	256,055	284,278	127,552	1,553	669,438	1,505	2	
	JUL	305,318	314,906	134,888	1,602	756,714	3,417	5	
	AUG	291,163	319,481	138,261	1,768	750,673	(16,744)	(23)	
	SEP	236,262	291,161	130,751	2,036	660,210	(29,714)	(41)	
	OCT	254,075	293,369	133,969	2,257	683,670	(12,797)	(17)	
	NOV	265,931	281,031	125,818	2,347	675,127	(10,953)	(15)	
	DEC	304,629	296,159	119,118	2,622	722,528	(8,899)	(12)	
	TOTAL	3,251,111	3,501,534	1,499,448	24,616	8,276,709	(117,477)	(13)	
October 22, 2008	JAN	306,414	293,593	123,505	2,612	726,124	(10,700)	(14)	used in final ES
	FEB	254,852	274,999	113,072	2,246	645,169	(14,335)	(21)	rate setting filing
	MAR	266,273	281,936	120,360	2,091	670,660	(19,828)	(27)	
	APR	226,615	267,000	114,414	1,868	609,897	(22,670)	(31)	
	MAY	224,523	267,721	120,182	1,584	614,010	(24,956)	(34)	
	JUN	244,761	278,944	121,882	1,548	647,135	(22,303)	(31)	
	JUL	293,532	311,837	129,169	1,602	736,140	(20,574)	(28)	
	AUG	279,842	313,014	131,880	1,773	726,509	(24,164)	(32)	
	SEP	225,541	283,327	125,667	2,048	636,583	(23,627)	(33)	
	OCT	244,373	286,715	125,891	2,261	659,240	(24,430)	(33)	
	NOV	255,887	273,477	118,731	2,353	650,448	(24,679)	(34)	
	DEC	293,158	288,963	119,579	2,624	704,324	(18,204)	(24)	
	TOTAL	3,115,771	3,421,526	1,464,332	24,610	8,026,239	(250,470)	(29)	
December 17, 2008	JAN	299,912	291,020	120,066	2,608	713,606	(12,518)	(17)	
	FEB	250,318	273,092	110,564	2,243	636,217	(8,952)	(13)	
	MAR	263,740	279,930	118,622	2,089	664,381	(6,279)	(8)	
	APR	224,683	265,201	112,980	1,866	604,730	(5,167)	(7)	
	MAY	223,469	265,855	119,108	1,582	610,014	(3,996)	(5)	
	JUN	243,794	277,061	121,038	1,547	643,440	(3,695)	(5)	
	JUL	293,139	309,717	128,667	1,601	733,124	(3,016)	(4)	
	AUG	279,680	311,091	131,621	1,772	724,164	(2,345)	(3)	
	SEP	225,092	281,801	125,487	2,047	634,427	(2,156)	(3)	
	OCT	243,936	282,638	125,907	2,260	654,741	(4,499)	(6)	
	NOV	255,094	267,768	118,822	2,352	644,036	(6,412)	(9)	
	DEC	292,315	285,617	119,889	2,624	700,445	(3,879)	(5)	
	TOTAL	3,095,172	3,390,791	1,452,771	24,591	7,963,325	(62,914)	(7)	

Public Service Company of New Hampshire
Docket No. DE 10-121

Technical Session TECH-01

Dated: 09/09/2010
Q-TS-004
Page 1 of 1

Witness: **Erica L. Menard**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
When did PSNH change to quarterly sales forecasts? Is PSNH adopting quarterly sales forecasts on a permanent basis, or are the quarterly forecasts only being done during periods of significant economic change?

Response:
PSNH/NU generally produces two sales forecasts per year - a long-term (5 year) sales forecast used during the corporate strategic planning process and a short-term (1-2 year) sales forecast used for corporate budgeting purposes. Beginning in 2008 with the downturn in the economy and its impact on the company's sales, it was decided by senior management that a mid-point update to the sales forecast would be performed. This update incorporates the latest economic forecast, additional months of actual data, and any other known changes that would impact the sales forecast. The updated sales forecast is analyzed to determine the financial impact to the company. At this point, it is anticipated the mid-point update to the sales forecast process will continue.

Public Service Company of New Hampshire	**Technical Session TECH-01**
Docket No. DE 10-121	**Dated: 09/09/2010**
	Q-TS-006
	Page 1 of 4

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Re: STAFF-02, Q-STAFF-010, please describe PSNH's decision making regarding its purchasing strategy. Describe PSNH's general purchasing strategy, the factors PSNH considered when purchases were made, and actions PSNH took in 2009 with respect to purchases that it made earlier.

Response:
The following three pages of tables provide a chronological summary of supplemental ES bilateral energy strip purchase activity for 2009 along with how the needs assessment changed. The chronology starts with the needs assessment and purchase plan released around April 1, 2008 that was approved by the president - PSNH and then in turn shows what was purchased prior to the next assessment and what that next assessment showed. The tables conclude with the assessment as it stood at the final ES rate setting filing and what the total set of bilateral energy strip purchases were as reflected in the final ES rate setting filing. The notes at the end of the tables provide some observations on the final assessment.

Over time PSNH has developed a general ES rate setting principal that over / under recoveries should be minimized as much as possible in order to provide for rate certainty for customers. To this end, over the years, the supplemental energy requirement purchase strategy evolved to the point where prior to submitting the final ES rate filing, the vast majority of forecasted supplemental energy requirements were covered either through unit contingent purchases, bilateral energy strips or options. While PSNH maintained flexibility to address changing circumstances, as discussed in its 2007 Least Cost Integrated Resource Plan (LCIRP) as filed and supplemented in March 2008, the objective was to cover most of the forecasted need. This ES rate setting principal was built on the premise that: 1) PSNH's sales forecast was reasonably accurate; and 2) migration was relatively low and seasonal in nature such that the volume of ES supplemental energy requirements was known with a high degree of certainty.

Data Request Staff-01, Q-Staff-009 and Staff-01, Q-Staff-009 SP01 compares 2009's ES supplemental energy purchase activity with the 2007 ES supplemental energy purchase narrative in the March 2008 Supplemental LCIRP filing. However, it bears repeating that both the original LCIRP and the Supplemental filing stress that PSNH continually reviews its approach to managing the ES supplemental energy requirements and that the 2007 ES supplemental energy requirement purchase narrative was not prescriptive but rather illustrative of how one year was managed. This same prescriptive versus illustrative concern was part of the 2010 ES rate setting docket.

Supplemental ES Energy Strip Requirements at Start of Bilateral Strip Purchasing Effort (April 1, 2008)

	Underlying ES Load GWh	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW
Jan-09	787,455	154,165	51,478	28,726	234,368	459	322	116
Feb-09	717,893	149,047	40,560	25,485	215,092	466	317	114
Mar-09	741,987	101,221	20,789	14,097	136,107	288	144	57
Apr-09	681,398	191,281	43,449	64,946	299,676	543	339	271
May-09	676,991	87,168	31,377	32,751	151,296	272	178	132
Jun-09	708,012	130,167	21,879	(25,374)	126,673	370	171	(106)
Jul-09	798,497	191,782	26,836	(10,677)	207,941	521	210	(43)
Aug-09	813,461	161,299	55,404	8,369	225,072	480	346	34
Sep-09	731,316	161,109	30,884	(3,848)	188,146	479	214	(16)
Oct-09	738,251	112,687	29,647	37,332	179,666	320	206	151
Nov-09	727,239	103,762	32,166	32,627	168,555	324	201	136
Dec-09	775,311	121,809	28,468	22,579	172,856	346	198	91
Grand Total	8,897,811	1,665,497	412,937	227,013	2,305,447			

Loads tie to preliminary 2009 business plan (AKA 2008 Budget)
Reflects zero migration, needs reduced by Bethlehem, Tamworth, Lempster and HQ Call Option in Mar-Dec

Bilateral Energy Strip Transactions Made Between 1st Assessment and 2nd Assessment (early July)

	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW
Jan-09	67,200	16,000	0	83,200	200	100	0
Feb-09	64,000	12,800	0	76,800	200	100	0
Mar-09	70,400	14,400	0	84,800	200	100	0
Apr-09	70,400	12,800	0	83,200	200	100	0
May-09	64,000	17,600	0	81,600	200	100	0
Jun-09	70,400	12,800	0	83,200	200	100	0
Jul-09	73,600	12,800	0	86,400	200	100	0
Aug-09	67,200	16,000	0	83,200	200	100	0
Sep-09	67,200	14,400	0	81,600	200	100	0
Oct-09	70,400	14,400	0	84,800	200	100	0
Nov-09	64,000	16,000	0	80,000	200	100	0
Dec-09	70,400	14,400	0	84,800	200	100	0
Grand Total	819,200	174,400	0	993,600			

Remaining Supplemental ES Bilateral Energy Strip Requirements at 2nd Assessment (early July)

	ES Load GWh	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW	Peak 5 x 16 % met	Weekend 2 x 16 % met	Offpeak 7 x 8 % met
Jan-09	787,455	86,965	35,478	28,726	151,168	259	222	116			
Feb-09	717,893	85,047	27,760	25,485	138,292	266	217	114			
Mar-09	741,987	30,821	6,389	14,097	51,307	88	44	57			
Apr-09	681,398	120,881	30,649	64,946	216,476	343	239	271			
May-09	676,991	23,168	13,777	32,751	69,696	72	78	132			
Jun-09	708,012	59,767	9,079	(25,374)	43,473	170	71	(106)			
Jul-09	798,497	118,182	14,036	(10,677)	121,541	321	110	(43)			
Aug-09	813,461	94,099	39,404	8,369	141,872	280	246	34			
Sep-09	731,316	93,909	16,484	(3,848)	106,546	279	114	(16)			
Oct-09	738,251	42,287	15,247	37,332	94,866	120	106	151			
Nov-09	727,239	39,762	16,166	32,627	88,555	124	101	136			
Dec-09	775,311	51,409	14,068	22,579	88,056	146	98	91			
Grand Total	8,897,811	846,297	238,537	227,013	1,311,847				49	42	0

Loads tie to preliminary 2009 business plan (AKA 2008 Budget)
Reflects zero migration, requirement reduced by Bilateral Energy Purchases, Bethlehem, Tamworth, Lempster, HQ Call Option in Mar-Dec

Bilateral Energy Strip Transactions Made Between 2st Assessment and 3nd Assessment (late July)

	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW
Jan-09	50,400	16,000	24,800	91,200	150	100	100
Feb-09	48,000	12,800	22,400	83,200	150	100	100
Mar-09	17,600	7,200	12,400	37,200	50	50	50
Apr-09	17,600	6,400	12,000	36,000	50	50	50
May-09	16,000	8,800	12,400	37,200	50	50	50
Jun-09	52,800	6,400	12,000	71,200	150	50	50
Jul-09	18,400	6,400	12,400	37,200	50	50	50
Aug-09	16,800	8,000	12,400	37,200	50	50	50
Sep-09	50,400	7,200	12,000	69,600	150	50	50
Oct-09	17,600	7,200	12,400	37,200	50	50	50
Nov-09	16,000	8,000	12,000	36,000	50	50	50
Dec-09	17,600	7,200	12,400	37,200	50	50	50
Grand Total	339,200	101,600	169,600	610,400			

Remaining Supplemental ES Energy Strip Requirements at 3rd Assessment (late July)

	ES Load GWh	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW	Peak 5 x 16 % met of original need	Weekend 2 x 16 % met of original need	Offpeak 7 x 8 % met of original need	Peak 5 x 16 % met of revised need	Weekend 2 x 16 % met of revised need	Offpeak 7 x 8 % met of revised need
Jan-09	781,365	34,608	17,760	1,488	53,856	103	111	6						
Feb-09	699,365	25,280	11,648	(448)	36,480	79	91	(2)						
Mar-09	732,240	3,520	(2,304)	3,224	4,440	10	(16)	13						
Apr-09	670,810	96,448	22,528	51,120	170,096	274	176	213						
May-09	677,591	6,080	5,280	21,824	33,184	19	30	88						
Jun-09	709,898	5,984	3,072	(34,800)	(25,744)	17	24	(145)						
Jul-09	802,456	96,048	7,680	(15,376)	88,352	261	60	(62)						
Aug-09	796,044	69,216	28,160	(9,920)	87,456	206	176	(40)						
Sep-09	700,129	31,584	3,600	(29,520)	5,664	94	25	(123)						
Oct-09	715,610	13,728	3,456	17,856	35,040	39	24	72						
Nov-09	713,299	17,600	5,120	15,840	38,560	55	32	66						
Dec-09	766,202	26,048	5,760	9,920	41,728	74	40	40						
Grand Total	8,765,009	426,144	111,760	31,208	569,112				70	67	75	73	71	84

Loads tie to 2009 business plan
Reflects zero migration, requirement reduced by Bilateral Energy Purchases, Bethlehem, Tamworth, Lempster, HQ Call Option in Mar-Dec

Bilateral Energy Strip Transactions Made Between 3rd Assessment and Initial ES Filing (early September)

	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW
Jan-09	16,800	0	0	16,800	50	0	0
Feb-09	16,000	0	0	16,000	50	0	0
Mar-09	0	0	0	0	0	0	0
Apr-09	17,600	12,800	24,000	54,400	50	100	100
May-09	0	0	0	0	0	0	0
Jun-09	0	0	0	0	0	0	0
Jul-09	18,400	0	0	18,400	50	0	0
Aug-09	16,800	0	0	16,800	50	0	0
Sep-09	0	0	0	0	0	0	0
Oct-09	0	0	0	0	0	0	0
Nov-09	0	0	0	0	0	0	0
Dec-09	0	0	0	0	0	0	0
Grand Total	85,600	12,800	24,000	122,400			

Remaining Supplemental ES Energy Strip Requirements at Initial ES Rate Filing (early September)

	ES Load GWh	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW	Peak 5 x 16 % met of original need	Weekend 2 x 16 % met of original need	Offpeak 7 x 8 % met of original need	Peak 5 x 16 % met of revised need	Weekend 2 x 16 % met of revised need	Offpeak 7 x 8 % met of revised need
Jan-09	769,256	759	17,364	354	18,476	2	109	1						
Feb-09	688,079	(3,791)	11,610	(975)	6,844	(12)	91	(4)						
Mar-09	719,954	34,461	11,003	1,057	46,521	98	76	4						
Apr-09	658,831	107,703	20,947	23,754	152,404	306	164	99						
May-09	664,966	33,406	21,607	19,370	74,383	104	123	78						
Jun-09	696,882	40,289	16,339	(34,337)	22,291	114	128	(143)						
Jul-09	788,668	85,051	21,975	(12,889)	94,137	231	172	(52)						
Aug-09	782,383	79,788	46,547	(6,643)	119,693	237	291	(27)						
Sep-09	687,197	55,405	15,409	(35,203)	35,612	165	107	(147)						
Oct-09	702,334	44,199	19,316	16,857	80,372	126	134	68						
Nov-09	700,859	47,204	20,794	14,956	82,953	148	130	62						
Dec-09	754,838	56,923	19,073	7,693	83,690	162	132	31						
Grand Total	8,614,247	581,397	241,984	(6,006)	817,376				75	70	85	68	54	103

loads tie to 2009 business plan
Reflects 22 MW of migration as measured at prior year peak, requirement reduced by Bilateral Energy Purchases, Bethlehem, Tanworth, Lempster, HQ Call Option dropped

Bilateral Energy Strip Transactions Made Between Initital and Final ES Rate Filings

	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW
Jan-09	(67,200)	0	0	(67,200)	(200)	0	0
Feb-09	(64,000)	0	0	(64,000)	(200)	0	0
Mar-09	0	0	0	0	0	0	0
Apr-09	35,200	0	0	35,200	100	0	0
May-09	0	0	0	0	0	0	0
Jun-09	0	0	0	0	0	0	0
Jul-09	0	0	0	0	0	0	0
Aug-09	0	0	0	0	0	0	0
Sep-09	0	0	0	0	0	0	0
Oct-09	0	0	0	0	0	0	0
Nov-09	0	0	0	0	0	0	0
Dec-09	0	0	0	0	0	0	0
Grand Total	(96,000)	0	0	(96,000)			

Between initial and final ES rate filings, oil was purchased for Newington at a price that allowed a potion of January and February enrgy purchases to be unwound

Remaining Supplemental ES Energy Strip Requirements at Final ES Rate Filing (early December)

	ES Load GWh	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW	Peak 5 x 16 % met of original need	Weekend 2 x 16 % met of original need	Offpeak 7 x 8 % met of original need	Peak 5 x 16 % met of revised need	Weekend 2 x 16 % met of revised need	Offpeak 7 x 8 % met of revised need
Jan-09	721,251	(6,397)	7,873	(16,417)	(14,940)	(19)	49	(66)						
Feb-09	640,600	(9,192)	3,337	(17,765)	(23,620)	(29)	26	(79)						
Mar-09	662,767	7,365	821	(19,684)	(11,498)	21	6	(79)						
Apr-09	598,813	(46,561)	(19,882)	(57,372)	(123,815)	(132)	(155)	(239)						
May-09	601,433	(26,057)	(13,050)	(29,562)	(68,670)	(81)	(74)	(119)						
Jun-09	632,752	4,905	5,569	(53,013)	(42,539)	14	44	(221)						
Jul-09	723,126	3,862	11,805	(28,331)	(12,664)	10	92	(114)						
Aug-09	714,913	108,190	82,324	63,328	253,841	322	515	255						
Sep-09	623,976	130,092	49,562	22,620	202,275	387	344	94						
Oct-09	637,174	126,315	53,477	72,906	252,698	359	371	294						
Nov-09	639,652	122,978	58,972	69,558	251,507	384	369	290						
Dec-09	697,556	50,439	8,620	(2,576)	56,482	143	60	(10)						
Grand Total	7,894,012	465,939	249,427	3,691	719,057				69	70	85	71	54	98

Loads tie to October 22, 2008 2009 budget forecast
Reflects 102 MW of migration as measured at prior year peak, requirement reduced by Bilateral Energy Purchases, Bethlehem, Tanworth, and Lempster, HQ Option dropped and Newington runs in Jan - Feb with sales displacing purchases

Final Bilateral Purchases Modeled in ES Dec Update from above

	Peak 5 x 16 GWh	Weekend 2 x 16 GWh	Offpeak 7 x 8 GWh	All hours GWh	Peak 5 x 16 MW	Weekend 2 x 16 MW	Offpeak 7 x 8 MW
Jan-09	67,200	32,000	24,800	124,000	200	200	100
Feb-09	64,000	25,600	22,400	112,000	200	200	100
Mar-09	88,000	21,600	12,400	122,000	250	150	50
Apr-09	140,800	32,000	36,000	208,800	400	250	150
May-09	80,000	26,400	12,400	118,800	250	150	50
Jun-09	123,200	19,200	12,000	154,400	350	150	50
Jul-09	110,400	19,200	12,400	142,000	300	150	50
Aug-09	100,800	24,000	12,400	137,200	300	150	50
Sep-09	117,600	21,600	12,000	151,200	350	150	50
Oct-09	88,000	21,600	12,400	122,000	250	150	50
Nov-09	80,000	24,000	12,000	116,000	250	150	50
Dec-09	88,000	21,600	12,400	122,000	250	150	50
Grand Total	1,148,000	288,800	193,600	1,630,400			

Observations on final ES filing situation

(1) Energy purchased as a percent of orignial purchase plan was 71%.
(2) As sales forecast declined and migration at peak increased purchases as a % of revised need tentatively increased.
(3) Merrimack 2 outage was not finally settled until around December 25, 2008, so April surplus and August through early December shortfalls were tentative in early December.
(4) Putting Merrimack outage back in April would make energy purchases look more aligned but would not have captured latest thinking and would have understated second half ES costs.
(5) Overall, taking into account weather uncertainty, potential forced outages and migration uncertainty at the time it was still considered likely that most purchases would go to serve load.

Public Service Company of New Hampshire
Docket No. DE 10-121

Technical Session TECH-01

Dated: 09/09/2010
Q-TS-007
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Please describe how you alter your supplemental purchases due to the impact of reserve shutdowns.

Response:
The supplemental ES energy purchase requirements forecast is the difference between forecasted hourly ES load requirements and forecasted economic generation where the availability between planned outages on steam units is assumed to be 100%. Thus, to the extent a unit's dispatch price is above the forecasted market price, the unit is either operated at less than full load or cycled off (i.e. put in reserve shutdown). Whether operated at less than full load or put in reserve shutdown, the impact is to increase the supplemental ES energy purchase requirement forecast.

With respect to 2009, throughout the period when 2009 supplemental ES energy requirement forecasts were being performed, but for Newington, the steam units were found to be economic to dispatch at their full output in non-planned outage periods. Thus, there were no forecasted reserve shutdowns, and supplemental ES energy purchase requirements did not increase due to reserve shutdowns.

Public Service Company of New Hampshire
Docket No. DE 10-121

Technical Session TECH-01

Dated: 09/09/2010
Q-TS-008

Witness: **Erica L. Menard**
Request from: **New Hampshire Public Utilities Commission Staff**

Question:
Referring to page 2 of 3 of the response to STAFF 02, Q-STAFF-006, why are the two forecasts shown there for 2009 identical even though one was made in October, 2008 and the other in March, 2009?

Response:
Please see the revised response to STAFF-02, Q-STAFF-006. The second forecast labeled "2009 ES June 19, 2009 Filing" which was developed in April 2009 was incorrectly displayed.

2009 ES December 2, 2008 Filing
MWH Sales Forecast: October 2008 (Not part of the official 2009 Budget Forecast which was released mid Dec 2008)
Economic Forecast Date: August 2008

	Residential Sales	Commercial Sales	Industrial Sales	Street Lighting Sales	Total Retail Sales	Competitive Supply Sales	Default Energy Service Sales	Default Energy Service Energy	DE
2009									
JAN	306,414	293,593	123,505	2,612	726,124	45,918	680,206	721,251	0.943
FEB	254,852	274,999	113,072	2,246	645,169	41,029	604,140	640,600	0.943
MAR	266,273	281,936	120,360	2,091	670,660	45,660	625,000	662,767	0.943
APR	226,615	267,000	114,414	1,868	609,897	45,264	564,633	598,812	0.943
MAY	224,523	267,721	120,182	1,584	614,010	46,926	567,084	601,434	0.943
JUN	244,761	278,944	121,882	1,548	647,135	50,539	596,596	632,751	0.943
JUL	293,532	311,837	129,169	1,602	736,140	54,283	681,857	723,127	0.943
AUG	279,842	313,014	131,880	1,773	726,509	52,379	674,130	714,913	0.943
SEP	225,541	283,327	125,667	2,048	636,583	48,238	588,345	623,976	0.943
OCT	244,373	286,715	125,891	2,261	659,240	58,456	600,784	637,173	0.943
NOV	255,887	273,477	118,731	2,353	650,448	47,256	603,192	639,652	0.943
DEC	293,158	288,963	119,579	2,624	704,324	46,496	657,828	697,556	0.943
Total	3,115,771	3,421,526	1,464,332	24,610	8,026,239	582,445	7,443,794		

2009 ES June 19, 2009 Filing
MWH Sales Forecast: April 2009 (2010 Business Plan Sales Forecast)
Economic Forecast Date: March 2009

	Residential Sales	Commercial Sales	Industrial Sales	Street Lighting Sales	Total Retail Sales	Competitive Supply Sales	Default Energy Service Sales	Default Energy Service Energy	DE
2009									
JAN	347,073	310,973	102,737	2,653	763,436	56,587	706,849		
FEB	262,032	256,774	105,964	1,859	626,629	77,675	548,954		
MAR	266,433	269,630	112,155	2,075	650,293	84,151	566,142		
APR	223,973	254,770	103,228	1,866	583,837	83,391	500,446		
MAY	212,726	262,045	110,182	1,500	586,453	99,133	487,320		
JUN	248,175	279,160	112,646	1,539	641,520	125,239	516,280	548,792	0.941
JUL	302,600	316,590	121,027	1,592	741,809	132,737	609,072	647,219	0.941
AUG	286,724	307,603	124,031	1,762	720,120	135,468	584,651	621,383	0.941
SEP	225,592	266,673	117,515	2,036	611,816	118,814	493,001	524,039	0.941
OCT	242,078	281,697	108,954	2,254	634,984	122,647	512,337	544,585	0.941
NOV	253,429	273,082	108,890	2,348	637,748	115,911	521,837	554,553	0.941
DEC	290,943	288,784	112,439	2,622	694,788	117,912	576,876	612,892	0.941
Total	3,161,778	3,367,781	1,339,768	24,105	7,893,432	1,269,666	6,623,765		

2010 ES September, 2009 Filing
MWH Sales Forecast: April 2009 (2010 Business Plan Sales Forecast)
Economic Forecast Date: March 2009

2010	Residential Sales	Commercial Sales	Industrial Sales	Street Lighting Sales	Total Retail Sales	Competitive Supply Sales	Default Energy Service Sales	Default Energy Service Energy	DE
JAN	301,035	292,154	109,922	2,620	705,731				
FEB	250,348	261,992	100,590	2,194	615,124				
MAR	261,185	283,455	108,646	2,084	655,370				
APR	222,039	266,472	104,220	1,863	594,594				
MAY	221,442	274,431	109,733	1,579	607,185				
JUN	246,747	283,284	111,223	1,543	642,797				
JUL	301,853	320,933	119,748	1,596	744,131				
AUG	285,783	311,573	122,279	1,766	721,402				
SEP	223,828	269,889	115,740	2,040	611,497				
OCT	239,632	275,759	115,906	2,258	633,555				
NOV	250,668	273,243	109,221	2,352	635,483				
DEC	287,704	291,190	109,652	2,626	691,172				
Total	3,092,263	3,404,375	1,336,880	24,521	7,858,039				

The following forecast was not included in any ES Rate Filing, but was performed by PSNH
MWH Sales Forecast: September 2009 (2010 Business Plan Update Sales Forecast)
Economic Forecast Date: July 2009

2010	Residential Sales	Commercial Sales	Industrial Sales	Street Lighting Sales	Total Retail Sales	Competitive Supply Sales	Default Energy Service Sales	Default Energy Service Energy	DE
JAN	299,538	294,936	103,331	2,620	700,425				
FEB	249,206	264,551	94,142	2,194	610,094				
MAR	260,230	286,324	102,372	2,084	651,009				
APR	221,375	269,258	98,170	1,863	590,666				
MAY	220,956	277,387	103,895	1,579	603,817				
JUN	246,426	286,408	105,623	1,543	640,000				
JUL	301,546	324,572	114,453	1,596	742,168				
AUG	285,568	315,190	117,328	1,766	719,853				
SEP	223,714	273,115	111,154	2,040	610,023				
OCT	239,573	279,142	111,676	2,258	632,650				
NOV	250,669	276,677	105,358	2,352	635,056				
DEC	287,788	294,923	106,148	2,626	691,484				
Total	3,086,591	3,442,483	1,273,649	24,521	7,827,244				

2010 ES December 2009 Filing
MWH Sales Forecast: December 2009 (2010 Budget Sales Forecast)
Economic Forecast Date: Septemner 2009

2010	Residential Sales	Commercial Sales	Industrial Sales	Street Lighting Sales	Total Retail Sales	Competitive Supply Sales	Default Energy Service Sales	Default Energy Service Energy	DE
JAN	304,020	293,446	103,872	2,615	703,953				
FEB	277,193	259,230	97,331	2,239	635,993				
MAR	256,758	274,564	105,116	2,080	638,518				
APR	234,012	255,924	99,897	1,857	591,690				
MAY	224,567	268,516	104,961	1,567	599,611				
JUN	242,150	279,225	106,381	1,536	629,292				
JUL	297,638	307,970	114,968	1,586	722,162				
AUG	295,405	300,100	121,065	1,759	718,329				
SEP	242,665	268,107	113,181	2,033	625,986				
OCT	236,705	266,547	112,603	2,254	618,109				
NOV	246,566	262,924	105,978	2,348	617,816				
DEC	287,481	287,653	106,034	2,622	683,790				
Total	3,145,160	3,324,206	1,291,387	24,496	7,785,249				

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-001
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
As set forth in PSNH's Direct Testimony of David A. Errichetti, page 3, lines 9 through 25, regarding PSNH's supplemental purchase requirements being heavily influenced by the economics of Newington, please describe if and how PSNH's supplemental purchase requirements are influenced by the economics of Merrimack Station Unit 1.

Response:
Yes. PSNH's 2009 forecasted supplemental energy requirements to serve forecast ES load obligations were lower than they would otherwise have been due to Merrimack unit 1's forecasted economic operation.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-002
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
As set forth in PSNH's Direct Testimony of David A. Errichetti, page 3, lines 9 through 25, regarding PSNH's supplemental purchase requirements being heavily influenced by the economics of Newington, please describe if and how PSNH's supplemental purchase requirements are influenced by the economics of Merrimack Station Unit 2.

Response:
Yes. PSNH's 2009 forecasted supplemental energy requirements to serve forecast ES load obligations were lower than they would otherwise have been due to Merrimack unit 2's forecasted economic operation.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-003
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
As set forth in PSNH's Direct Testimony of David A. Errichetti, page 3, lines 9 through 25, regarding PSNH's supplemental purchase requirements being heavily influenced by the economics of Newington, please describe if and how PSNH's supplemental purchase requirements are influenced by the economics of Schiller Unit 4.

Response:
Yes. PSNH's 2009 forecasted supplemental energy requirements to serve forecast ES load obligations were lower than they would otherwise have been due to Schiller unit 4's forecasted economic operation.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-004
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
As set forth in PSNH's Direct Testimony of David A. Errichetti, page 3, lines 9 through 25, regarding PSNH's supplemental purchase requirements being heavily influenced by the economics of Newington, please describe if and how PSNH's supplemental purchase requirements are influenced by the economics of Schiller Unit 5.

Response:
Yes. PSNH's 2009 forecasted supplemental energy requirements to serve forecast ES load obligations were lower than they would otherwise have been due to Schiller unit 5's forecasted economic operation.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-005
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
As set forth in PSNH's Direct Testimony of David A. Errichetti, page 3, lines 9 through 25, regarding PSNH's supplemental purchase requirements being heavily influenced by the economics of Newington, please describe if and how PSNH's supplemental purchase requirements are influenced by the economics of Schiller Unit 6.

Response:
Yes. PSNH's 2009 forecasted supplemental energy requirements to serve forecast ES load obligations were lower than they would otherwise have been due to Schiller unit 6's forecasted economic operation.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-006
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
Referring to PSNH's Direct Testimony of David A. Errichetti, page 3, lines 16-18, please provide the process used by PSNH to assess the need for market purchases with respect to the cost of generating power for each of Merrimack Station Units 1 and 2, and Schiller Station Units 4, 5, and 6 in comparison to the cost of purchasing power.

Response:
At the time PSNH prepares its initial supplemental energy purchase forecast and during subsequent iterations, the forecasted dispatch prices of each of the aforementioned units are compared to then current forward bilateral energy prices for peak and off peak hours. To the extent that a unit's dispatch price is less than or equal to the forward bilateral energy prices, it is assumed to operate when not on scheduled maintenance, thus reducing the amount of supplemental energy purchases needed to serve forecasted ES load obligations.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-007
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
Referring to PSNH's Response of David A. Errichetti to NHPUC Staff data request 01-008, please explain whether and how the actual annual capacity factors in 2009 for each of Merrimack Station Units 1 and 2, and Schiller Station Units 4, 5, and 6 were affected by economic outages. Please explain whether there were any periods in 2009 in which the foregoing units did not operate because the cost of purchasing power was less than the cost of operating each unit including the fixed and variable cost for each unit. Please identify any such periods.

Response:
Each of the coal plants did modify its operation due to the economic/energy prices and had economic reserve outages as noted below. Schiller's biomass unit, Unit 5, had no economic reserve-outages.

Merrimack #1 had two, short reserve-outages over weekend periods occurring at the end of forced outages. These impacted MK1 capacity factor 1.38%. Similarly, Merrimack Unit 2 has two short reserve outages and a 9 hour window at the end of forced outages. These impacted MK2 capacity factor 1.03%.

Schiller Unit 4 had 7 reserve-outages of varying lengths that impacted capacity factor by 12.2% and Schiller Unit 6 had 8 reserve-outages of varying lengths that impacted capacity factor by 8%.

Note that fixed costs including depreciation, property taxes, debt service and return on equity do not play a role in the daily dispatch of the unit.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-008
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
Referring to PSNH's Direct Testimony of William H. Smagula, page 3, lines 3 and 4, what were the dates during which Merrimack Station's Unit 1 had its 125.65 day run in 2009?

Response:
Merrimack Unit 1 achieved its 3rd longest run on April 20, 2009. This run began on December 16, 2008.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-009
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
For each day of that 125.65 day period, please provide the average hourly cost and average daily cost of purchasing power at spot market pricing.

Response:
The average hourly cost and average daily cost of purchasing power at spot market is available from the ISO-NE web site.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-010
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
Please identify any and all hours during that 125.65 day period when the hourly cost of generating power at Merrimack Station's Unit 1 including both variable and fixed costs was higher than the cost of purchasing power at spot market pricing. Please identify any and all days during that 125.65 day period when the average cost of generating power at Merrimack Station's Unit 1 including both variable and fixed costs was lower than the average cost of purchasing power at spot market pricing.

Response:
PSNH does not use forecasted or actual fixed costs in its daily dispatch decision process and thus does not have the information necessary to respond to this question. Also, day-ahead cleared energy prices are after the fact values and are the result of many individual decisions by market participants reacting in part to next day bilateral energy prices. Moreover, such day-ahead cleared energy prices would be different had any particular generating station, such as Merrimack 1, not operated. In addition, the operating characteristics of base-load generating stations such as Merrimack 1 do not allow the unit to cycle on and off hourly so dispatch decisions are not made hourly.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-011
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
Referring to PSNH's Direct Testimony of William H. Smagula, page 3, lines 4 and 5, what were the dates during which Schiller Unit 6 had its 124 consecutive day run in 2009?

Response:
Schiller Unit 6 achieved its record run on April 2, 2009. This run began on November 25, 2008.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-01

Dated: 07/16/2010
Q-CLF-013
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
Please identify any and all hours during that 124 day period when the hourly cost of generating power at Schiller Unit 6 including both variable and fixed costs was higher than the cost of purchasing power at spot market pricing. Please identify any and all days during that 124 day period when the average cost of generating power at Schiller Unit 6 including both variable and fixed costs was lower than the average cost of purchasing power at spot market pricing.

Response:
PSNH does not use forecast or actual fixed costs in its daily dispatch decision process and thus does not have the information necessary to respond to this question. Also, day-ahead cleared energy prices are after the fact values and are the result of many individual decisions by market participants reacting in part to next day bilateral energy prices. Moreover, such day-ahead cleared energy prices would be different had any particular generating station, such as Schiller Unit 6, not operated. In addition, the operating characteristics of base-load generating stations such as Schiller Unit 6 do not allow the unit to cycle on and off hourly so dispatch decisions are not made hourly.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-02

Dated: 08/13/2010
Q-CLF-001
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
With regard to PSNH's Response of David A. Errichetti, Q-CLF-006, please explain the process used by PSNH to schedule operations for each of Merrimack Station Units 1 and 2, and Schiller Station Units 4, 5, and 6 when subsequent iterations of PSNH's supplemental energy purchase forecast concludes that a unit's dispatch price is greater than forward bilateral energy prices. Please explain how frequently PSNH updated its initial supplemental energy purchase forecast to assess the extent that PSNH's units dispatch price was predicted to be less than or equal to bilateral energy prices in 2009. Please explain and provide any process and/or protocols in place for updating the initial supplemental energy purchase forecast.

Response:
With respect to the forecast process the only consideration missing from the original response is that once the unit is determined to be economic to operate, the forecast is adjusted to reflect planned maintenance outages and the operation between planned maintenance outages is reduced to allow for forced outages. The latter adjustment is spread across all intervening hours because forced outages are by their nature not predictable.

During 2009, subsequent to the initial supplemental energy purchase forecast done around April 1, 2008, there were four published assessments of supplemental ES energy requirements: two before the initial ES rate setting filing, the initial ES rate setting filing, and the final ES rate setting filing. Between these there were conversations but no formal assessments.

There is no prescriptive process or set of protocols on updating the initial supplemental energy purchase forecast. PSNH monitors the forecast and updates it to the extent necessary to account for changing circumstances.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-02

Dated: 08/13/2010
Q-CLF-002
Page 1 of 2

Witness: **David A. Errichetti**
Request from: **Conservation Law Foundation**

Question:
With regard to PSNH's response of William Smagula, Q-CLF-007, please provide and explain the reasons and duration (including time and dates) for each reserve outage referenced in said response. Please provide the amount saved by PSNH due to each such reserve outage, along with calculation methodology for each such reserve outage.

Response:
Below are the times that each reserve outage referenced in Q-CLF-007 occurred and a rough estimate of the resulting savings. Reserve outages occur because the combination of operating characteristics and offered prices result in the unit not being dispatched. PSNH does not believe that savings or costs can explicitly be calculated for reserve outages. This is because there are numerous variables that can not be accurately taken into account such as changes in subsequent hot and cold starts and changes in mechanical wear and fuel inventory carrying costs costs or changed delivery schedules. However, the table below provides a sense of the savings realized by comparing the theoretical hourly avoided generation multiplied by the difference between the average yearly $/MWh cost for each unit and the corresponding day-ahead hourly nodal LMP. The theoretical hourly avoided generation represents the units' rating adjusted for a between outage availability factor unless the units' dispatch price is above the hourly LMP in which case the theoretical hourly generation is the unit's minimum rating.

Merrimack 1

Start Time	End Time		Savings
04/24/2009 15:55	04/27/2009 6:00	$	56,753
07/24/2009 11:50	07/25/2009 2:01	$	5,836

Merrimack 2

Start Time	End Time		Savings
05/16/2009 14:55	05/18/2009 5:00	$	21,936
06/28/2009 17:22	06/30/2009 11:25	$	47,782
07/22/2009 6:30	07/22/2009 16:27	$	(3,265)

Schiller 4

Start Time	End Time		Savings
05/30/2009 23:50	06/10/2009 1:59	$	114,289
06/12/2009 13:10	06/14/2009 16:00	$	25,627
06/20/2009 0:31	06/21/2009 23:30	$	20,263
07/03/2009 0:05	07/21/2009 14:29	$	219,625
07/22/2009 15:21	07/28/2009 5:04	$	62,117
07/30/2009 0:20	08/03/2009 0:10	$	46,917
08/08/2009 0:27	08/10/2009 5:00	$	26,078

Schiller 6

Start Time	End Time		Savings
06/13/2009 0:20	06/24/2009 23:26	$	130,348
07/01/2009 0:00	07/06/2009 5:00	$	61,946
07/11/2009 0:12	07/13/2009 5:55	$	28,677
07/18/2009 0:07	07/18/2009 10:29	$	5,446
07/21/2009 14:31	07/21/2009 23:52	$	4,097
10/06/2009 17:01	10/07/2009 7:00	$	7,452
11/21/2009 0:15	11/23/2009 11:00	$	30,012
11/23/2009 22:20	11/27/2009 8:59	$	36,393
11/29/2009 11:36	12/01/2009 23:59	$	22,594

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-02

Dated: 08/13/2010
Q-CLF-003
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
With regard to PSNH's Response of David A. Errichetti, Q-CLF-010, please state and explain the time period (and operational basis for the time period) for which dispatch decisions can prudently be made with regard to allowing units to cycle on and off, based on the operating characteristics for each of Merrimack Station Units 1 and 2, and Schiller Station Units 4, 5, and 6. Please include in your response the economic factors, such as the cost difference between the variable cost for each such unit and the forecasted spot market pricing, at which it was or would have been prudent for PSNH to purchase energy from the energy market rather than self-supply.

Response:
Merrimack Station Units 1 and 2, and Schiller Station Unit 5 are operated as base load units with low load minimums and on/off constraints. Schiller Units 4 and 6 are operated as base load units as well with similar minimums but have additional flexibility with the option to come off line daily. The specific dispatching criteria including Hot Notification Time (hrs.), Minimum Run Time (hrs.), Minimum Shutdown Time (hrs.), Manual Response Rate (MW/min.), and Minimum Load (MW) are market-sensitive, confidential business information as part of our bidding strategy. However, the daily bidding of each unit is a reflection of the above criteria, the condition of the units, other potential operational considerations, etc. An assessment of these criteria is the basis for the daily bidding; rather than a presumption that a single cost difference on a daily basis between variable cost and forecasted spot market pricing will always be the prudent answer.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-02

Dated: 08/13/2010
Q-CLF-004
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
Please explain the process used by PSNH for notifying ISO-NE that PSNH's units were operated to self-supply rather than being subject to ISO-NE dispatch control on the merits. Please explain the wholesale market status of such units during periods for which the units were operating to supply energy for PSNH's customer load. Please provide the dates and times and explain the basis for any periods during 2009 when PSNH notified ISO-NE that PSNH-owned units were available for merit-based dispatch by ISO-NE.

Response:
Self supply requests are made as part of PSNH's daily process of offering its resources into the ISO-NE Day-Ahead or Real-Time energy markets. Self-scheduling is not an all or nothing proposition. It is possible to self-schedule all or a portion of a unit for all or part of the upcoming day. To the extent a unit is not fully self-scheduled for the entire day, the balance of available hourly capability is offered at a price. The self-scheduled portion of a unit's dispatch, once accepted by ISO-NE, is flagged in the ISO-NE energy market as self-scheduled. There is no mechanism in the ISO-NE wholesale energy market to indicate that you are dispatching a resource to serve load.

With respect to non-itermittent power resources, non-hydro units, merit offers are made for available capability for each hour and self-schedule requests override the merit offers. Thus ISO-NE is notified of merit offers for available capacity in all hours.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-02

Dated: 08/13/2010
Q-CLF-005
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
With regard to PSNH's response of William Smagula, Q-OCA-004, please explain and provide the details of the operational consequences to Merrimack unit 2 and economic consequences to PSNH which resulted from the "foreign material event" including impacts to output (such as total reduction in energy generated in 2009) and net unit generating capability. Please explain and provide a breakdown of the basis for the $10,843,635 of replacement power costs provided in response to Q-OCA-005 including sums attributable to diminished capacity and/or output.

Response:
In 2009, Merrrimack Unit 2 operated at an output level of approximately 320 MW until the beginning of the turbine repair outage on August 1. The expected higher output associated with the turbine replacement was not obtained until after the repair outage (August- December) was completed. To make the necessary repairs associated with the foreign material event, a repair outage was taken from August 1 to December 6. This outage was approximately 18 weeks long, rather than the scheduled 4 week annual outage. The incremental generation between 320 MW and the current 332 MW, an associated capacity value, as well as the additional 14 weeks of outage, will have no economic impact on customers with the expected reimbursement from insurance because PSNH expects those costs to be fully covered by insurance.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request CLF-02

Dated: 08/13/2010
Q-CLF-006

Witness: **William H. Smagula**
Request from: **Conservation Law Foundation**

Question:
With regard to PSNH's response of William Smagula, Q-OCA-008, please provide the details of the operational consequences to Merrimack unit 2 and economic consequences to PSNH which resulted from the "crack found on the MK2 generator exciter rotor" including impacts to output (such as total reduction in energy generated in 2009) and net unit generating capability. Please explain and provide a breakdown of all costs for addressing and repairing the generator including sums attributable to diminished capacity and/or output. Please explain whether any market purchases were made by PSNH due to the exciter rotor crack and repairs.

Response:
There was no impact to output and net unit generating capability associated with the MK2 generator exciter rotor. PSNH obtained a rental unit and installed it during the 2008 scheduled outage. A permanent replacement was installed during the 2009 annual outage. A monthly charge of approximately $120,000 was paid for the rented portable exciter, yet this cost was significantly less than an extended outage of as much as 16 - 24 weeks to obtain a replacement exciter. PSNH also negotiated a waiver of a portion of the total rental fees. The cost for replacing the exciter rotor was $247,700.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-01

Dated: 07/16/2010
Q-SCNH-005
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
Have the heat rate and efficiency projects described by the William H. Smagula response to Data Request Q-STAFF-059 caused the Merrimack Station firing rate to increase? Have the projects caused NOx emission rates to increase in tons per year [TPY]? By how much? Will the increases require increased O&M and capital budget costs? Please specifically detail the basis of the costs. Are other heat rate and efficiency projects planned? What effect will these projects have on budgeting?

Response:
No. The heat rate and efficiency projects do not increase the firing rate. These projects do not increase NOx emission rates.

PSNH objects to the remainder of this question. Please see PSNH's Objections to Sierra Club's Data Requests filed July 23, 2010.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-01

Dated: 07/16/2010
Q-SCNH-012
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
The Stipulated Settlement Agreement in Docket DE 09-091, provided that there would be an opportunity, during the 2009 reconciliation process, to review the investigation of third party liability for costs of the foreign material outage. $13,200,000 of purchased power costs were passed on to ratepayers in the 2008 reconciliation process. What is the status of that investigation? Why wasn't a report of the investigation part of the filing and testimony in the current docket?? What proposed adjustments, if any, were made in the 2009 reconciliation presentation to account for any recovery of the 2008 purchased power costs from third parties? The reconciliation testimony and Attachments of William H. Smagula, MK2-Unit Outage List, state that MK2 was down from August 1, 2009, until December 6, 2009, as a "Planned Annual Outage". The reconciliation testimony and Attachments presented by Robert A. Baumann provide no specific detail of the costs attributable to the foreign material outage. Was the August 1, 2009, to December 6, 2009, outage attributable to the foreign material damage? If yes, please specifically detail the work done; who did the work; the total cost of the work; and, any costs that are included in the reconciliation presentation intended for ratepayer recovery, including damage replacement and repair, purchased power costs and all other costs caused by or attributable to the foreign material damage, including PSNH personnel and overhead costs.

Response:
As stated in Set OCA-1, Q-OCA-004, the source of the foreign material remains under investigation by the insurance company and at this point no responsible 3rd party has been identified. PSNH continues to support the investigative efforts. The outage from August 1, 2009 to December 6, 2009 was taken to repair the turbine damage associated with the foreign material event. Siemens completed the turbine repair work. Outage costs, related to work on the turbine, associated with this 18 week outage have been submitted to the insurance company for reimbursement. Also see response to OCA-01, Q-OCA-005.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-02

Dated: 08/13/2010
Q-SCNH-001
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
A third party vendor/contractor was responsible for the foreign material damage to the Merrimack 2 turbine. The significant purchased power costs for 2008 were not reimbursed by insurance or third party vendor/contractors as no adjustments were booked in the 2009 reconciliation presentation. In answer to OCA Data Request 005, PSNH stated that $28,859,720 was the 2009 cost for the turbine damage and $10,000,000 insurance proceeds were received. Please specifically describe PSNH efforts to investigate the responsible party and to recover the costs of the damage. Please identify the PSNH employee[s] responsible for the investigation. Please provide each and every document regarding the investigation, including, but not limited to, investigative reports, correspondence, email and memoranda.

Response:
The investigation associated with the foreign material event was reviewed as part of the 2008 ES/SCRC Docket No. DE 09-091. Please see the responses to CLF-2, Q-005 and OCA-2, Q-001 for additional information concerning the insurance claims.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-02

Dated: 08/13/2010
Q-SCNH-002
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
Which, if any, Merrimack 2 turbine contractor/vendor has contractual or indemnification liability [independent of fault] for the foreign material damage? Please provide the names and addresses of such contractor/vendor. Please provide any such contractual language. Please specifically describe PSNH efforts to pursue any such contractually responsible party to recover the costs of the damage. Please identify the PSNH employee[s] responsible for pursuing the contractual claim. Please provide each and every document regarding the claim, including, but not limited to, investigative reports, correspondence, email and memoranda.

Response:
The foreign material event occurred and was reviewed as part of the 2008 ES/SCRC Docket No. DE 09-091. Please see the responses to CLF-2, Q-005 and OCA-2, Q-001 for additional information concerning the insurance claims.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-02

Dated: 08/13/2010
Q-SCNH-003

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
William H. Smagula, Director-Generation, PSNH, in response to Q-Staff-032, described negotiations with Siemens regarding the replacement and repair project. Mr. Smagula described the negotiations as an effort to "mitigate costs" and "gain value" for customers. Was third party liability for the foreign material damage discussed during the Siemens negotiations? If yes, please describe the discussion and provide the documentation that supports the answer. Mr. Smagula further stated that it is not possible to specifically quantify the financial impact of the Siemens negotiations because it is "subjective". Please provide, as accurately as possible, an explanation of the $10,000,000 estimate that Mr. Smagula did provide.

Response:
No, third party liability was not discussed during the Siemens negotiations.

An explanation of the negotiated value obtained from Siemens Power Corporation approaching as much as $10 million is discussed below.

- $0.78M for the negotiated reduction in rental payments for the MK 2 Mobile Exciter from October 2008 to April 2009.

- $3M or greater estimated with the continuation of the 10 year warranty on the refurbished HP/IP turbine equivalent to what was to be provided on the originally installed, new HP/IP turbine. The continuation of this equivalent warranty was achieved at no additional cost.

- >$5M as an estimated avoided cost associated with the opening, repairing and closing of the turbine on a lesser frequency due to a reinstatement of the performance guarantees on the refurbished HP/IP turbine equivalent to those in place on the originally installed equipment.

$0.9M estimated for the 19 month interest free retention of the over $7 million payment for the performance guarantees requested by Siemens upon obtaining initial performance data on initial start-up in May 2008, until the actual demonstration was achieved in December 2009.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-02

Dated: 08/13/2010
Q-SCNH-004

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
William H. Smagula, Director-Generation, PSNH, in response to Q-Staff-059, listed a number of projects that improved the fossil unit heat rates, including the HP/IP turbine project. In response to Q-Staff-022, Mr. Smagula stated that the net energy of 12 MW was due to equipment gains. Mr. Smagula also stated that an additional unit capacity of just over 5 MW was demonstrated. He did not attribute the 5MW+ increase to efficiency gains. Please provide the documentation that supports Mr. Smagula's responses, both as to the efficiency gains and the additional unit capacity.

Response:
Merrimack Unit 2 receives capacity credit for 338 MW associated with the turbine project efficiency gains as shown on the ISO web page.

The unit operates at approximately 332 MW (12 MW above the previous 320 MW net operation) due to efficiency gains associated with the turbine project as shown below.

Historical operation at 320 MW				Increased output at 332 MW (Improved turbine efficiency)		
date	hour	Net Gen MW		date	hour	Net Gen MW
01 Jan 10	01	321.15		06 Jan 10	13	332.35
01 Jan 10	02	320.95		06 Jan 10	14	332.25
01 Jan 10	03	320.60		06 Jan 10	15	331.65
01 Jan 10	04	320.70		06 Jan 10	16	332.90
01 Jan 10	05	320.70		06 Jan 10	17	333.10
01 Jan 10	06	320.50		06 Jan 10	18	331.95
01 Jan 10	07	320.60		06 Jan 10	19	332.15
01 Jan 10	08	320.55		06 Jan 10	20	331.85
01 Jan 10	09	320.85		06 Jan 10	21	331.40
01 Jan 10	10	320.90		06 Jan 10	22	331.20
01 Jan 10	11	321.00		06 Jan 10	23	331.60
01 Jan 10	12	320.70		06 Jan 10	24	332.20

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request SCNH-02

Dated: 08/13/2010
Q-SCNH-005
Page 1 of 1

Witness: **William H. Smagula**
Request from: **Sierra Club, New Hampshire Chapter**

Question:
William H. Smagula, Director-Generation, PSNH, was asked, in Q-Staff-052, about the PSNH-Generation decision making process between necessary spending in critical areas and overall cost of production; and, whether or not that balancing means that required capital or maintenance would not be performed to meet cost goals. Staff Data Request Q-Staff-052 dovetails exactly with NHSC Data Requests 4, 6, 9 and 13 which were calculated to examine the prudence of any deferred maintenance on pollution control equipment. In PSNH response to the NHSC Data Requests, PSNH stated that it "did not track operating and maintenance costs associated with specific pieces of equipment". PSNH, in response to the Staff Data Request, provided the general answer that it: "[M]akes budget determinations based on maintenance records, test data, consulting experts, past experiences and other generating facilities experiences". Please explain in detail how PSNH determines the maintenance/cost balance if it does not track the costs associated with specific pieces of pollution control equipment.

Response:
PSNH consistently repairs, maintains or performs preventative maintenance on equipment at its generating facilities. This work is based on the maintenance records of the equipment, test data, etc. Performance of equipment can also be an indicator of necessary maintenance, as is the case with pump performance, turbine performance or pollution control equipment performance, as examples. Specific costs to perform these on-going efforts are not tracked to unique pieces of equipment, but rather included as part of the overall O&M (operations and maintenance) budget for the year.

In addition to the on-going, periodic maintenance there can also be targeted maintenance projects to address safety, reliability, environmental compliance, etc. Once identified, maintenance projects are planned to maximize value to customers. For example, it might be more cost effective to replace a piece of equipment, rather than repairing it depending on the cost of labor and parts. The length of outage time required for the maintenance project is also considered, as well as any future maintenance anticipated based on the maintenance approach taken. Again, for example, grouping longer maintenance projects together to be completed during a single longer outage is a more cost-effective option considered, avoiding multiple longer outages and saving customers money. This review and analysis allows management to assess the maintenance/cost benefit balance to insure customer value. This type of work is more likely to be tracked to specific pieces of equipment. Finally, any maintenance necessary to insure compliance would not be considered discretionary, and would be recognized in the planning and cost/benefit analysis.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-001
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please explain why you believe that the portion of the costs incurred to serve PSNH's default service customers during 2009 related to energy and capacity purchases and sales were prudent. Please state the basis for this conclusion.

Response:
We believe the costs referred to were prudent because we exercised the standard of care which qualified utility management would be expected to exercise under the circumstances that existed at the time the decision in question had to be made. See the response to TC-01, Q-TC-017.

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
With reference to page 5, lines 10-22 of Mr. Baumann's prefiled testimony in this docket, please provide specific information about the energy purchases that were made to supply PSNH's default service customers during 2009, including the dates the contracts were executed, the duration of the contracts, the contracting party, the quantity purchased and the purchase prices.

Response:
The attached table provides the following information for bilateral energy and short term unit contingent purchases made for 2009: execution date, duration, size, price and power delivery period. PSNH believes providing contracting party and pricing is commercially sensitive information and not needed for purposes of this review. PSNH will provide the table with contracting parties and pricing to Staff and the OCA, if requested, under a motion for protective order.

Standardized Contracts

Execution Date	Contracting Party	Duration			Size (MW)	Price ($/MWh)	Power Delivery Period
04/30/2008		01/01/2009	-	12/31/2009	50		5X16
05/13/2008		01/01/2009	-	12/31/2009	50		5X16
05/30/2008		01/01/2009	-	12/31/2009	50		7X16
07/01/2008		01/01/2009	-	12/31/2009	50		7X16
07/14/2008		01/01/2009	-	12/31/2009	50		7X24
07/22/2008		06/01/2009	-	06/30/2009	100		5X16
07/22/2008		09/01/2009	-	09/30/2009	100		5X16
07/22/2008		01/01/2009	-	02/28/2009	100		5X16
07/23/2008		01/01/2009	-	02/28/2009	50		OFFPEAK
07/29/2008		04/01/2009	-	04/30/2009	100		OFFPEAK
08/07/2008		04/01/2009	-	04/30/2009	50		5X16
08/07/2008		01/01/2009	-	02/28/2009	50		5X16
08/08/2008		07/01/2009	-	08/31/2009	50		5X16
11/17/2008		04/01/2009	-	04/30/2009	100		5X16
01/21/2009		01/22/2009	-	01/22/2009	50		5X16
01/21/2009		01/23/2009	-	01/23/2009	100		5X16
01/21/2009		01/22/2009	-	01/22/2009	50		5X16
01/28/2009		01/30/2009	-	01/30/2009	100		5X16
01/28/2009		01/29/2009	-	01/29/2009	200		5X16
01/29/2009		01/30/2009	-	01/30/2009	100		5X16
01/29/2009		08/01/2009	-	11/30/2009	200		7X24
01/30/2009		01/31/2009	-	02/01/2009	50		2X16
01/30/2009		01/31/2009	-	02/01/2009	50		2X16
01/30/2009		02/02/2009	-	02/02/2009	150		5X16
02/02/2009		02/03/2009	-	02/03/2009	100		5X16
02/06/2009		02/10/2009	-	02/13/2009	100		5X16
02/06/2009		02/09/2009	-	02/09/2009	100		5X16
02/12/2009		02/13/2009	-	02/13/2009	200		5X16
02/12/2009		02/14/2009	-	02/15/2009	200		2X16
02/25/2009		02/26/2009	-	02/26/2009	100		5X16
02/25/2009		02/27/2009	-	02/27/2009	100		5X16
02/25/2009		02/26/2009	-	02/26/2009	150		5X16
02/25/2009		02/27/2009	-	02/27/2009	150		5X16
06/24/2009		06/27/2009	-	06/28/2009	300		2X16
06/26/2009		06/29/2009	-	06/29/2009	200		5X16
07/21/2009		07/22/2009	-	07/22/2009	300		5X16
08/18/2009		08/19/2009	-	08/19/2009	150		5X16
08/20/2009		08/21/2009	-	08/21/2009	150		5X16
08/21/2009		08/22/2009	-	08/23/2009	150		2X16
12/02/2009		12/03/2009	-	12/03/2009	200		5X16
12/03/2009		12/04/2009	-	12/04/2009	150		5X16

Structured and/or Unit-Contingent Contracts

Execution Date	Contracting Party	Duration			Size (MW)	Price ($/MWh)	Power Delivery Period
10/19/2007		01/01/2008	-	12/31/2010	36		as produced

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-005
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please list the employees of PSNH or NUSCo who engaged in power trading activities to supply PSNH's default service customers during 2009 and what their background and qualifications are.

Response:
The following persons provide support for PSNH's ES supply portfolio:

Patrick Smith is a Manager in the Wholesale Power Contracts group. He is employed by Northeast Utilities Service Company. Mr. Smith has been an employee of Northeast Utilities since 1992 holding various positions in generation, transmission and has been with the Wholesale Power Contracts group for 10 years.

David Errichetti is Manager Generation Resource Planning in the Wholesale Power Contracts group. He is employed by Northeast Utilities Service Company. Mr. Errichetti has been an employee of Northeast Utilities since 1982 holding various positions in generation resource planning and has been with the Wholesale Power Contracts group for 10 years.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-007
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please explain the factors that were considered by the employees of NUSCo or PSNH in making the power purchases that were necessary to serve PSNH's default service customers during 2009. Provide any and all documentation that was relied upon to make these decisions, including internal procedures or protocols and outside sources that were relied upon.

Response:
Please see the response to Staff-01, Q-Staff-009. In addition please see the response to TC-01, Q-TC-014. Lastly, attached is the redacted information provided in response to TRANSCANADA-01, Q-TC-013 in Docket DE 09-180 providing procedures that touch on PSNH ES supplemental procurement.

.

Northeast
Utilities System

Wholesale Marketing Policy

PSNH Load Asset Management

Approved By:

____
Gary A. Long
President & Chief Operating Officer - PSNH

Effective Date: June 3, 2008

Revision: 1

1 Overview

1.1 The Regulated Wholesale Marketing ("RWM" or also known as Wholesale Power Contracts) Department's Policies and Procedures (P&P) will ensure a level of oversight and control which is commensurate with the business undertakings and risks associated with a regulated electric utility company.

2 Departmental Policies and Procedures

2.1 RWM will maintain detailed and accessible procedures to control and manage the work process. The RWM Policies and Procedures (P&P) will be maintained as a controlled document. Each procedure will have a designated process owner who will be responsible for maintaining such procedure. Procedures can be incorporated by reference into the RWM P&P.

2.2 The Director – Wholesale Power Contracts will be responsible for obtaining approval for P&P. Policies will be approved by the PSNH President and the Director – Wholesale Power Contracts.

2.3 RWM Procedures will include:

- PSNH Energy Service Power Supply Planning and Development.
  - Annual power supply portfolio planning process
- PSNH Portfolio Management
  - Planning process for load obligation fulfillment.
  - Hedging, including Financial Transmission Rights (FTR)
  - Bidding and Scheduling of load/generation
- Contract Administration
  - Details for the development, approval and administration of contracts with marketing and trading counterparties
- Transaction execution and reporting
  - Transaction execution
  - Deal capture, accounting designation and reporting

- Controls, including independent confirmation
- Exceptions

3 Authorized Activities

3.1 RWM is authorized to conduct activities associated with power related products in support of PSNH load obligation activities and Renewable Energy Certificate (REC) purchases and sales. The conduct and scope of these activities is limited to the ISO-NE power pool and adjoining power pools. Adjoining power pools include New York ISO, New Brunswick and Hydro-Quebec.

3.2 [redacted]

3.3 Power related products are defined as:

- Energy (Day Ahead spot market, Real Time spot market and bilateral contracts).
- Capacity (Unforced Capacity, Locational Installed Capacity, Installed Capacity).
- Ancillary services, such as spinning reserve requirements, operating reserves.
- Structured products (ex. Financial Transmission Rights, Generation Outage Insurance, Put Options, Call Options, Transmission wheeling arrangements, etc.)
- Renewable Energy Certificates

4 Departmental Policies and Procedures

4.1 **Transactional limits** are based on PSNH power supply strategy (Annual, Monthly, Day to Day).

- Annual – An annual evaluation of power supply requirements will be performed as part of the PSNH Energy Service (ES) filing. Transactions associated with this annual review will require written authorization from the President – PSNH. These transactions will include energy, capacity and other power related products.

- Monthly – Transactions which were not addressed in the annual ES evaluation and which may be of duration from one month to one year will require written authorization from the President- PSNH.
- Day to Day – Transactions of one month or less will require written authorization from Manager – Wholesale Marketing or designee, or the Director –Wholesale Power Contracts, or the President-PSNH. Manager – Wholesale Marketing is authorized to enter into transactions of this duration up to a dollar limit of [redacted]. If transaction value will exceed this limit, authorization is required from Director –Wholesale Power Contracts. Additionally, any sales of option contracts must be approved by Director – Wholesale Power Contracts.
- Once authorization for the transactions is received the Manager – Wholesale Marketing, or designee, will be responsible to execute transactions in accordance with RWM P&P.

4.2 Volumetric Limits

4.2.1 Capacity – PSNH ES capacity needs are met thru owned generation resources and purchased from the ISO-NE. The ES costs associated with the provision of capacity are forecasted and incorporated into the ES rate filing approved by NH PUC. Thru June, 2010 ISO-NE capacity markets have been established which allow generation to receive a fixed price (per Mega-Watt-month). Bilateral transactions are not expected to occur during this time period. Commencing with June, 2010 ISO-NE has implemented a FERC approved Forward Capacity market where price is derived from an ISO-NE administered auction. [redacted]

Contract quantities will be limited to [redacted]

If RWM is unable to execute bilateral contracts on terms considered favorable to PSNH customers, the ISO-NE auctions will be utilized for the net ES requirement..

4.2.2 Energy – RWM will limit spot market purchasing risk, through bilateral contracts, generator availability / utilization or other means. The spot market purchase limits are detailed below and will be determined based on the daily load / generation forecast of the RWM Bidding and Scheduling Group. The limits will be calculated for each time period by netting together the load requirements for such period with the available generation, bilateral purchases and bilateral sales for the period. If these volumetric energy limits are exceeded, approval must be given by Director – Wholesale Power Contracts.

Time Period	Volume Limit % of total daily obligation for specific time period
[redacted]	[redacted]
[redacted]	
[redacted]	[redacted]
[redacted] [redacted]	[redacted]

4.2.3 Resource to Load Congestion Cost – [redacted]

4.2.4 Renewable Energy Certificates ("RECs") purchased for ES rate customers – Commencing with Calendar Year 2008, the state of New Hampshire has implemented a Renewable Portfolio Standard ("RPS") which requires that a portion of the power supply services provided to PSNH ES rate customers be derived from generation compliant with NH RPS. Compliance is exhibited annually through a filing to NHPUC and can be met with either NH compliant RECs or through an Alternate Compliance Payment ("ACP"). An ACP is provided in lieu of compliant RECs [redacted]

5 Renewable Energy Certificate Sales

5.1 RWM is authorized to sell RECs derived from PSNH owned and operated generation, in particular, Northern Wood Power Project, generation entitlement contracts and IPPs. REC's may be marketed and sold which are not required to meet NH RPS for ES rate customer load. The following process will be utilized for control of REC sales transactions:

5.1.1 [redacted]

5.1.2 [redacted]:

[redacted]

- [redacted]

5.1.3 Sales Contract Signatures: Forward Sales contracts will be signed by President – PSNH or designee. Inventory Sales contracts will be signed by Director – Wholesale Power Contracts or designee.

6 Credit and Contract Requirements

6.1 RWM shall transact all business activities in accordance with:

- Contract requirements as detailed in the RWM "Contract Administration" procedure.
- Counterpart creditworthiness and controls as detailed in the "Credit Risk Management" procedure.

7 Reporting

7.1 RWM will be responsible to provide accurate and timely reporting of all transaction information in accordance with approved RWM P&P. As a minimum, RWM will participate in the development and/or report the following:

[redacted]

- [redacted]

7.2 [redacted]

8 Systems

8.1 Information Technology (IT) systems will be controlled in accordance with Corporate IT standards.

8.2 RWM critical business processes will be designed such that security of data, disaster recovery and business continuity have been addressed.

9 Revision History

Version Number	Date	Modified By	Revision Description
0	08/24/2004	P. Smith	First issuance.
1	12/22/05	P. Smith	Incorporated allowance for REC transactions.

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT PORTFOLIO MANAGEMENT	NAME & NUMBER REGULATED WHOLESALE MARKETING PROCEDURE RWM - 2
DATE APPROVED Nov. 1, 2009	DATE EFFECTIVE October 1, 2004	PROCEDURE OWNER Manager, Wholesale Power
REVISION 2	APPLICABLE TO PSNH	APPROVED BY James R. Shuckerow Director, Wholesale Power Contracts

PURPOSE

This document defines Regulated Wholesale Marketing's ("RWM") procedures regarding the PSNH Load Management activities including:

- Planning process for load obligation fulfillment
- Hedging
- Bidding and Scheduling for PSNH Generation and Load Obligations

GENERAL INFORMATION

RWM, along with various PSNH functional groups, has an important role in the PSNH Energy Service ("ES") Rate development and management process. The Energy Service provides generation service to the PSNH customers who have not chosen a competitive retail supplier.

PROCEDURE

Annual ES Strategy

Procedure RWM-1 entitled " Regulated Wholesale Marketing's Role in PSNH's Energy Service Associated with Power Supply Planning and Development," details the process of developing the annual PSNH ES rate. At an appropriate point in the development of the ES rate, a hedging strategy team will be assembled to explore options available to achieve greater price certainty in the area of power procurement. The strategy team must coordinate with PSNH Generation to ensure that the hedge plan incorporates the appropriate level of reliance on fossil-hydro generation. This team will develop a recommendation for power hedging activity to be utilized in the next ES rate year.

The recommended hedge plan should be discussed with PSNH Regulatory and PSNH Generation departments. Final submittal of the plan to President – PSNH is required to obtain authorization. Once authorization is received all transactions will be performed in accordance with applicable RWM Policies and Procedures.

Monthly ES Strategy Assessment

A Monthly meeting to Review ES Performance vs Forecast will be conducted. Manager – Wholesale Power and Manager – Generation Resource Planning will be responsible to facilitate the meeting. [redacted]

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT PORTFOLIO MANAGEMENT	NAME & NUMBER REGULATED WHOLESALE MARKETING PROCEDURE RWM - 2

DATE APPROVED	DATE EFFECTIVE	PROCEDURE OWNER
Nov. 1, 2009	October 1, 2004	Manager, Wholesale Power
REVISION 2	APPLICABLE TO PSNH	APPROVED BY James R. Shuckerow Director, Wholesale Power Contracts

[redacted]

Additionally, it is recognized that market conditions may change such that modifications to the annual hedge plan may be warranted. Any modifications to the annual hedging strategy will be submitted to the appropriate entity for authorization prior to execution. Authorization limits will be in accordance with RWM Policies and Procedures.

Daily Strategy

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Contract Scheduling:

Contracts which require physical delivery (Energy, Capacity) will be scheduled in the appropriate Independent System Operator ("ISO") market system. These schedules must be submitted by one party (typically the seller) and approved by the other (typically the buyer). Mgr – WP or designee is responsible to schedule and confirm physical deliveries in the market system in accordance with the timing requirements of the applicable market rules.

Financial Transmission Rights

[redacted]

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT **CONTRACT ADMINISTRATION**	NAME & NUMBER **REGULATED WHOLESALE MARKETING PROCEDURE RWM - 3**
DATE APPROVED **November 1, 2009**	DATE EFFECTIVE **October 1, 2004**	PROCEDURE OWNER **Manager, Wholesale Power**
REVISION **3**	APPLICABLE TO **CL&P, PSNH, WMECO**	APPROVED BY **James R. Shuckerow** **Director, Wholesale Power Contracts**

PURPOSE

This document defines Regulated Wholesale Marketing's ("RWM") procedures for the following activities:

1. Development, approval and administration of contracts with wholesale marketing, trading and merchant energy counterparties
2. Approval and contract development for a new product.

RWM is authorized, per departmental policies, to transact various power related products. This procedure is intended to provide the guidelines which will ensure that these business activities are done in accordance with approved policy.

GENERAL INFORMATION

The power related products which RWM is authorized to transact for purposes of this procedure are categorized as one of the following:

1. Structured Products: Financial Transmission Rights, Congestion Hedges, Generation Outage Insurance, Put Options, Call Options, Transmission Wheeling Arrangements.
2. Standard Products: Energy (including Day Ahead and Real Time) and Capacity (including Unforced Capacity, Locational Installed Capacity and Installed Capacity) and Renewable Energy Certificates ("REC") contracts

Contracts associated with CL&P Full Requirements Service (FRS) and WMECO Default Service (DS) are not included in this procedure. These contracts and the associated processes are covered in procedure RWM-7 (CL&P FRS Solicitation) and RWM-8 (WMECO Default Service Solicitation). In addition, long term contracts entered into as a result of a DPUC order or legislative requirement are not included in this procedure.

PROCEDURE

Contracts / Confirmations

Contracts entered into by the RWM group are valuable company resources. These contracts should clearly document the terms and conditions under which business arrangements have been made with counterparties. These contracts will, at all times, remain in compliance with all applicable laws, regulations and tariffs. Contracts will be executed in accordance with approved departmental policies and corporate governance.

It is the preference of RWM to transact with approved counterparties under master enabling agreements. The existing, accepted master enabling agreements include the NUSCO Tariff #7 **("T7")** agreements and Edison Electric Institute Master Purchased Power and Sales Agreement. The list of executed T7 agreements is included as Attachment 2 to this procedure. To the extent a master enabling agreement is not available transactions will be executed via a Long Form Contract or Letter Agreement. Manager – Wholesale Power ("Mgr – WP") will ensure that contracts and confirmations are executed by the appropriate individual, as identified in Appendix A.

Development of New Contracts / Confirmations

From time to time a transaction may require the development of a new Long Form Contract, Letter Agreement or execution of a new master enabling agreement.

A new Long Form Contract or Letter Agreement will require review by Legal and Credit Risk Management, as well as, Manager – Wholesale Power ("Mgr – WP"). Once all concerns are addressed and the Long Form Contract or Letter Agreement is suitable for execution, Mgr – WP will forward the agreement to the appropriate person, as identified in Appendix A, for signature.

Where a new master enabling agreement is desired or required. The following base contracts are considered acceptable for a new enabling agreement:

1. Edison Electric Institute Master Power Purchase and Sale Agreement (EEI MPPSA) for the purchase or sale of electric capacity, energy or other power related products.
2. International Swap Dealers Association, Inc. (ISDA) for financial transactions.

These base contracts are industry standard templates and as such no changes are allowed to the base contract. The enabling agreements which are finally executed with a counterparty will include specific modifications to an attachment, schedule or annex which have received approval from Legal, Credit Risk Management, Accounting and Contract Administration – Revenue Services, as appropriate.

The Mgr – WP is responsible to prioritize the development of new contracts with counterparties and will coordinate the review by the various functional areas (including Legal, Credit Risk Management and Accounting). Legal, Credit and Accounting are accountable for the enforceability of the contract terms pertaining to their areas of responsibility.

New Product Approval

If a transaction is contemplated for a power related product which has not been authorized by RWM Departmental Policies and Procedures the following product approval process will be utilized:

- The new product "initiator" will review the product concept with Mgr – WP and Director – Wholesale Power Contracts. If the concept is supported an assessment of product pricing, deal structure and risk will be developed and forwarded to the appropriate operating company president or senior officer for review and approval.
- If approval is obtained from the appropriate operating company president or senior officer a contract will be developed with input from the appropriate functional areas. At a minimum Legal, Credit and RWM will review and concur with the new product contract.
- RWM Policies and Procedures will be updated, as required, to incorporate the approved new product.

FASB 133, as amended, Procedures

The requirements of Accounting for FASB 133, as amended, compliance are noted in the Regulated Derivative Accounting Procedure.

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT CONTRACT ADMINISTRATION	NAME & NUMBER REGULATED WHOLESALE MARKETING PROCEDURE RWM - 3

DATE APPROVED	DATE EFFECTIVE	PROCEDURE OWNER
November 1, 2009	October 1, 2004	Manager, Wholesale Power
REVISION 3	APPLICABLE TO CL&P, PSNH, WMECO	APPROVED BY James R. Shuckerow Director, Wholesale Power Contracts

REVISION HISTORY

Version Number	Date	Modified By	Revision Description
0	08/24/2004	P. Smith	First issuance.
1	12/22/05	P. Smith	Incorporated allowance for REC transactions.
2	June 1, 2008	P. Smith M. Paquette	Include RECs; eliminate reference to risk roundtable; minor conforming updates
3	June 1, 2009	L. Harris, P. Smith	Update Procedure Owner to Manager, Wholesale Power, Remove T6 from Contracts section and remove Attachment 1

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT PORTFOLIO MANAGEMENT	NAME & NUMBER REGULATED WHOLESALE MARKETING PROCEDURE RWM - 2

DATE APPROVED	DATE EFFECTIVE	PROCEDURE OWNER
Nov. 1, 2009	October 1, 2004	Manager, Wholesale Power
REVISION	**APPLICABLE TO**	**APPROVED BY**
2	PSNH	James R. Shuckerow Director, Wholesale Power Contracts

REVISION HISTORY

Revision Number	Date	Modified By	Revision Description
1.0	6/1/08	P. Smith M. Paquette	Incorporates change in designation of Full Requirements to Energy Service; clarified FTR information by referencing Procedures RWM-4 and RWM-12
2.0	11/1/09	L. Harris M. Paquette	Update Procedure Owner to Manager, Wholesale Power; TS/DS updated to ES

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT **TRANSACTION, EXECUTION, CONFIRMATION AND REPORTING FOR POWER RELATED PRODUCTS**	NAME & NUMBER **REGULATED WHOLESALE MARKETING PROCEDURE RWM - 4**

DATE APPROVED	DATE EFFECTIVE	PROCEDURE OWNER
June 1, 2008	**October 1, 2004**	**Manager, Wholesale Marketing**
REVISION **3**	APPLICABLE TO **CL&P, PSNH, WMECO**	APPROVED BY **James R. Shuckerow** **Director, Wholesale Power Contracts**

PURPOSE

This document defines Regulated Wholesale Marketing's ("RWM") procedures for transaction execution, confirmation and reporting. RWM is authorized, per departmental policies, to transact various power related products. This procedure is intended to provide the guidelines which will ensure that such business activity is done in accordance with approved policy.

GENERAL INFORMATION

The power related products which RWM is authorized to transact for purposes of this procedure are categorized as one of the following:

1. Structured Products: Financial Transmission Rights, Congestion Hedges, Generation Outage Insurance, Put Options, Call Options, Transmission Wheeling Arrangements.

2. Standard Products: Energy (including Day Ahead and Real Time) and Capacity (including Unforced Capacity, Locational Installed Capacity and Installed Capacity) and Renewable Energy Certificates ("REC") contracts.

Contracts associated with CL&P Full Requirements Service (FRS) and WMECO Default Service (DS) are not included in this procedure. These contracts and the associated processes are covered in procedure RWM-7 (CL&P FRS Solicitation) and RWM-8 (WMECO Default Service Solicitation). In addition, long term contracts entered into as a result of a DPUC order or legislative requirement are not included in this procedure.

PROCEDURE

Transaction Authorization

The Manager – Wholesale Power Marketing ("Mgr – WPM") is responsible to monitor all transactions and ensure that authorization is in accordance with the limits established by departmental policy. Authorization must be provided in writing. It is, however, recognized that verbal authorization will be adequate for transaction execution so long as written authorization is provided within a reasonable period of time.

Transaction Execution and Capture

Once authorization for a transaction is received the Mgr – WPM, or designee, is responsible to execute the transactions.

Transactions must be performed in accordance with applicable departmental policy and procedures. Contracts will be utilized which adhere to the guidance provided in the "Contract Administration" (RWM-3) procedure and transaction counterparties will be listed on the Authorized Counterparty List or exceptions list as provided by the Credit Risk Management group.

To the extent that a transaction can not be performed in accordance with policy and procedure, an exception report must be generated and provided to Director – Wholesale Power Contracts ("Director-WPC"). This report will include the reasons therefore and actions being taken.

Transactions for Standard Products

- Will be executed, when possible, over recorded lines.
- Will be recorded in a trader's notebook by the Mgr – WPM and will indicate the date of the transaction.
- Will be checked by the end of business day with the broker, if applicable.
- Will be entered into the Regulated Wholesale Internal Bilateral Transaction System ("RWITS") by the end of business day. All relevant details of the transaction will be recorded in RWITS, including an initial transaction designation as required by Accounting for compliance with the requirements of FASB Number 133, as amended.

Transactions for Structured Products:
Guidelines for the execution and reporting of specific Structured Products is provided in Appendix A to this procedure.

Transaction Confirmation and Reporting
Once transactions have been executed and entered, as appropriate, into RWITS, the Mgr – WPM, or designee, is responsible to ensure that transaction information is correct and provided to the appropriate NU organizations.

Mgr – WPM will review all confirmations / contracts received to ensure that all parties to the transaction (NUSCO, broker and counterpart) have correctly identified all transaction terms and conditions. This review will be conducted as confirmations / contracts are received. Confirmations and contracts will be executed in accordance with the requirements of the "Contract Administration" procedure RWM-3.

Additionally, if a transaction confirmation for a purchase is not received Mgr – WPM or designee will send a confirmation to the counterpart. In the case of a sale to a counterpart, Mgr – WPM or designee will generate and send a confirmation. All transactions confirmations will be available for review by Mgr – GRP or designee.

A copy of contracts for Structured Products will be provided to the Contract Administration, Revenue Services group for billing and recording.

Contracts for RECs will be stored electronically in a Lotus Notes database which is accessible to the contract administration revenue services group. REC contracts will be placed in the Lotus Notes database within two weeks from final execution.

Several transaction reports will be provided:

[redacted]

[redacted]

BUSINESS PROCEDURE

Northeast Utilities System	SUBJECT **TRANSACTION, EXECUTION, CONFIRMATION AND REPORTING FOR POWER RELATED PRODUCTS**	NAME & NUMBER **REGULATED WHOLESALE MARKETING PROCEDURE** **RWM - 4**

DATE APPROVED **June 1, 2008**	DATE EFFECTIVE **October 1, 2004**	PROCEDURE OWNER **Manager, Wholesale Marketing**
REVISION **3**	APPLICABLE TO **CL&P, PSNH, WMECO**	APPROVED BY **James R. Shuckerow** **Director, Wholesale Power Contracts**

[redacted]

[redacted]

REVISION HISTORY

Revision Number	Date	Modified By	Revision Description
1.0			
2.0	June 1, 2008	P. Smith M. Paquette	Update for RECs; eliminate reports to risk roundtable and biweekly report to operating company president; minor conforming updates
3.0			

Public Service Company of New Hampshire	**Data Request TC-01**
Docket No. DE 10-121	**Dated: 07/16/2010**
	Q-TC-008
	Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please provide a detailed budget that explains all of the administrative costs of purchasing power to service PSNH's default service customers in 2009 that were charged to PSNH, including direct charges, employee costs and company overheads.

Response:
There is no specific budget item for power trading activities. However, information related to the services provided by the Northeast Utilities Wholesale Power Contracts group for 2009 has been provided in responses to Staff-01, Q-Staff-029 through Q-Staff-031.

Public Service Company of New Hampshire	**Data Request TC-01**
Docket No. DE 10-121	**Dated: 07/16/2010**
	Q-TC-009
	Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
In deciding how much power to purchase to supply PSNH's default service customers for 2009 what assumptions did PSNH or NUSCo use with regard to the amount of power that would be produced by generation owned by PSNH and what assumptions did it use with regard to outages at those generating units.

Response:
Please see the response to Staff-01, Q-Staff-009. Specific system assumptions such as dispatch prices, planned outages and loads were obtained from the appropriate departments and were subject to change as the purchase plan was executed and were revised in consultation with the appropriate departments. Generally speaking, throughout the period when energy purchases were being made the coal units were forecasted to be economic and were thus base loaded (other than for planned maintenance); hydro output was modeled at the historic 20 year average output; Newington was economically dispatched; Vermont Yankee was modeled based on information provided by Entergy; and energy purchases from independent power producers under long term rate orders, short term rate orders and purchased power agreements were modeled based on historic or forecast deliveries.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-013
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please provide any migration forecasts that were relied upon during the time period that the power purchases were made to serve PSNH's default service customers for 2009.

Response:
As noted in response to TC-01, Q-TC-010, then-current migration levels were considered in forecasted energy purchase planning. Please see the response to Staff-01, Q-Staff-010 for a measure of migration levels being experienced when the 2009 energy purchases were being planned and made.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-014
Page 1 of 2

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please provide copies of publicly available forecasts relied on by PSNH for the purposes of the purchases that were made and that were used to supply load to PSNH's default service customers in 2009.

Response:
PSNH uses, among other sources, NYMEX to track forward electricity prices. PSNH also subscribes to services that either produce original opinions or report on what others are saying. The attached graph shows NYMEX daily peak period prices for calendar year electricity delivered at the Massachusetts hub for 2009, 2010 and 2011 for June 1, 2007 through September 30, 2008.

NYMEX Daily Peak Period Prices for Calendar Year Electricity Delivered at the Massachusetts Hub

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-016

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
If the response to request #15 is yes, was this because PSNH or NUSCo locked into multi-year contracts to buy power to meet customer demand that PSNH was not able to satisfy with its own generation ?

Response:
As noted in response to TC-01, Q-TC-015 PSNH does not know with certainty that its ES rate was above market for all customers throughout 2009. Regardless of whether PSNH's 2009 ES rate was above or below market, PSNH knows that the multi-year contract identified in TC-01, Q-TC-002 was not the sole driver of ES pricing.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-017
Page 1 of 1

Witness: **Robert A. Baumann**
Request from: **TransCanada**

Question:
With reference to Mr. Baumann's prefiled testimony in this docket, p. 8, line 20, what definition of "prudent' does PSNH rely upon ?

Response:
PSNH objects to this question on the grounds that it seeks a legal conclusion, and not factual information in the possession of the company.

Notwithstanding this objection, PSNH responds as follows:

The word "prudent" is a term of the art used universally in the regulation of utility companies. The NHPUC and the Supreme Court of New Hampshire, amongst others, have provided many definitions of the prudence standard.

For example, in the "Agreement to Settle PSNH Restructuring" approved by the Commission in Docket No. DR 99-099, the term "Prudence" is defined as follows:

Prudence: The standard of care which qualified utility management would be expected to exercise under the circumstances that existed at the time the decision in question had to be made. In determining whether a decision was prudently made, only those facts known or knowable at the time of the decision can be considered.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-018
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
With reference to Mr. Errichetti's prefiled testimony in this docket, p. 1, lines 8-16, please explain whether the "design and execution of the power supply sourcing contracts associated with" CL&P and WMECO involves the issuance of RFPs.

Response:
No, CL&P and WMECo do not use RFPs in the design or execution of the power supply sourcing contracts associated with those companies' versions of ES. They do use RFPs to solicit power supplies to meet their versions of ES.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-01

Dated: 07/16/2010
Q-TC-019

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
Please explain how much of the administrative services that NUSCo provides to CL&P and WMECO involves a strategy used to procure energy in the same manner as what is provided to PSNH.

Response:
At present, none of the administrative services that NUSCo provides to CL&P and WMECO involves a strategy used to procure energy in the same manner as what is provided to PSNH.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-02

Dated: 08/13/2010
Q-TC-001

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
With reference to the PSNH response to TC-01, please explain in detail what is meant by the phrase "standard of care which qualified utility management would be expected to exercise" in the context of this response. Please provide examples of other utilities to which PSNH's or NUSCo's practices in this context could be compared.

Response:
See the response to TransCanada Set No. 1, Q-TC-017 which puts the quoted passage into its appropriate context. With respect to examples, PSNH is not aware of any other utilities that supply default energy service in a restructured electric environment that uses its owned generation assets and then acquires supplemental power to supply the rest of its default energy service load.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-02

Dated: 08/13/2010
Q-TC-002

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
With reference to the PSNH response to TC-06, please explain in detail why similar services were not provided to other Northeast Utilities affiliates.

Response:
In the context of TC-01, Q-TC-005, power trading activities to supply PSNH's default service customers during 2009 referred to the purchase or sale of individual components of full requirements electricity supply such as energy or FTRs for specific generation or bilateral energy transactions. Similar services were not provided to other Northeast Utilities affiliates because they operate under different statutory and regulatory requirements.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request TC-02

Dated: 08/13/2010
Q-TC-003
Page 1 of 1

Witness: **David A. Errichetti**
Request from: **TransCanada**

Question:
With reference to the PSNH response to TC-018, please explain in detail how RFPs are used by CL&P and WMECo to solicit power supplies to meet their versions of ES.

Response:
Requests for Proposals are used to secure full requirements electricity power supplies for CL&P and WMECo's default service loads.

In Connecticut full requirements power supply is secured through an RFP process up to three years in advance for residential, commercial/industrial with demands less than 500 kW, and street lighting customers such that, by the start of any year 100% of the first half of that year has been purchased; and every three months for commercial/industrial customers with demands of at least 500 kW. As noted in TC-02, Q-TC-002 pricing is received reflecting either Connecticut zonal energy prices or MA Hub energy prices.

In Massachusetts full requirements power supply is secured through an RFP process for residential, small commercial/industrial, and street lighting customers, with 50% for 12 months starting in July and 50% for 12 months starting in January; and for large commercial/industrial customers every three months.

Public Service Company of New Hampshire
Docket No. DE 10-121

Data Request STAFF-01

Dated: 06/16/2010
Q-STAFF-059

Witness: William H. Smagula
Request from: New Hampshire Public Utilities Commission Staff

Question:
For each of the fossil units, please provide the heat rates for the years 2005 – 2009. Please also describe actions taken during those years to improve the heat rates and/or otherwise improve operational efficiencies.

Response:
Below are the average annual heat rates for years 2005 - 2009. The full load heat rate, often a better indicator of efficiency improvements, is also provided for 2009. Efforts taken to maintain and improve heat rates over the years include the following:

Routinely completing boiler tuning and optimization
Installing more efficient boiler control systems
Installing more efficient air conditioning at MK and NT
Installing new high pressure feedwater heaters
Instituting a new condenser cleaning procedure at MK2
Increasing the generator H2 purity from 95 to 97% at MK2
Adding capacitors to the SBAC motor at MK2
Increasing the generator H2 purity from 97 to 98.5% at MK2
Increasing Merrimack's compressed air system efficiency by adding a new 100 psi air compressor and 100 & 300 psi receiver tanks.
Improving lighting efficiency by changing out lights at Newington, Merrimack, and Schiller Stations.
Reducing MK2 air heater leakage by retubing portions of the air heater.
Replacing the MK 2 HP/IP turbine
Reducing the MK2 air heater cold end average to improve overall efficiency
Reducing SBAC energy consumption by 5% by upgrading the SBAC controls
Installing new air compressors
Replacing the air ejector at Schiller 6

	Average annual heat rate					Full load heat rate
MK1	2005	2006	2007	2008	2009	FL 2009
Heat Rate	10,184	10,376	10,264	9,933	10,211	9,900
MK2	2005	2006	2007	2008	2009	FL 2009
Heat Rate	10,071	10,328	10,157	9,723	9,919	9,520
NT	2005	2006	2007	2008	2009	FL 2009
Heat Rate	11,522	12,270	11,723	11,690	12,382	10,900
SR4	2005	2006	2007	2008	2009	FL 2009
Heat Rate	12,558	12,832	13,405	12,244	13,019	12,900
SR5	2005	2006	2007	2008	2009	FL 2009
Heat Rate	12,871	9,398	15,565	16,689	17,122	15,800
SR6	2005	2006	2007	2008	2009	FL 2009
Heat Rate	12,379	12,460	12,528	12,072	12,644	12,300

Heat Rate (BTU/kwhrs)
Full load heat rate is the approximate heat rate at steady-state, full load conditions which excludes the inefficiencies that occur during start-ups, shut downs, ramps and lower load operations