THE STATE OF NEW HAMPSHIRE
before the
PUBLIC UTILITIES COMMISSION

Public Service Company of New Hampshire
Merrimack Station Scrubber Project
Request for Information

Docket No. DE 08-103

Report

October 15, 2010

By Secretarial Letter dated September 29, 2010, the Commission directed Public Service Company of New Hampshire ("PSNH" or the "Company") to file updated information concerning the status of the "Clean Air Project" - - the legislatively mandated installation of wet flue gas desulphurization ("FGD") technology ("scrubber" technology) by PSNH at Merrimack Station. In particular, the Commission directed PSNH to address:

I. A comprehensive status report on its installation progress;

II. A detailed cost estimate for the Project (including costs incurred and committed);

III. An analysis of the anticipated effect of the Project on the energy service rates;

IV. An analysis of the effect on energy service rates if Merrimack Station were not in the mix of fossil and hydro facilities operated by PSNH; and

V. The current state of the electric power markets, PSNH's forecast of power market prices, and how the scrubber Project conforms to PSNH's Least Cost Integrated Resource Plan.

This Report is intended to comply with the Commission's directive.

I. SCRUBBER INSTALLATION PROGRESS

This report provides an update to the Company's September 2, 2008, report on the Clean Air Project. It focuses on certain key actions which will provide appropriate guide posts for the progress of the Project.

Since responding to the Commission's original 2008 information request, PSNH has made extraordinary progress in the construction of the Project in accordance with the legislative mandate to put the scrubber into operation "as soon as possible" (RSA 125-O:11,I), with the

support and assistance of the New Hampshire Department of Environmental Services ("NHDES"). NHDES issued Temporary Permit TP-0008 for the Project on March 9, 2009. That permit was the primary prerequisite for construction activities on the site. All major contracts had been executed prior to that time, enabling PSNH to begin construction immediately upon issuance of the permit. Since that time, with safety always the top priority, PSNH staff and URS, PSNH's program manager, have succeeded in orchestrating the work of many contracts and hundreds of workers. Through September 2010, over 700,000 Project contractor man-hours have been dedicated to this work, *with no lost time accidents on the site*. At this time, Project construction is approximately 75% complete, well ahead of the statutory schedule that the legislature determined to be in the public interest.

Overall the Project has progressed extremely well with timely execution beginning with design, engineering, and procurement, and transitioning to field engineering and construction activities over the two-year period from October 2008 to date. Field engineering and construction work is now in full swing with approximately 480 people working on the Project, of which over 350 are building trades craftsmen.

In this report, we will continue with the chronology of major actions from where the 2008 Report ended (September 2008).

A. Activities Performed in the Fourth Quarter, 2008

Quarter 4: Contracts for the four major islands--the scrubber, chimney, waste water treatment facility, and material handling system--were finalized, executed, and released for engineering during this period. A number of smaller contracts were also executed, such as those for the installation of an FGD construction substation and site preparation work. Other critical contracts for the Project were either out for bid or in negotiations. A substantial amount of engineering work was completed by URS. Also, many permits were applied for and obtained from the Town of Bow, NHDES and other regulatory bodies. These permits authorized a number of planned activities, including the demolition of small buildings and preparation for future foundations, contractor parking, temporary office trailers, and material lay down areas. Site preparatory work was planned in order to proceed expeditiously with actual construction upon receipt of the Temporary Air Permit from NHDES and other necessary permits. As with any complex construction project, the permitting effort would be an ongoing one, requiring frequent communications with various agencies.

A variety of other approvals were sought and obtained from the Town of Bow relating to site work. Area towns were notified and adjacent towns were fully briefed on the Project. Public outreach and information sessions were held with a number of organizations such as the Southern New Hampshire Planning Commission and towns including the Town of Pembroke and the Town of Hooksett, among others.

B. Activities Performed During 2009

Quarter 1: Significant engineering activity continued in early 2009 with URS providing a high volume of design and technical support for the Project. This information was critically

needed in order to provide the Town of Bow and other local and State agencies with sufficient technical information required by various approval processes for authorization to proceed with work. The most significant permit was received on March 9 when the Temporary Air Permit (TP-0008) was received from the NHDES Air Resources Division. This permit provided the authorization for actual construction of the Project to proceed.

Additional contracts were executed for activities such as smaller foundations, third party quality control, and inspection and testing. Site traffic patterns and construction strategies were finalized which identified the best locations for things such as Project office trailers, work force gates, work force parking, and material lay down areas. This work was essential to accommodate the large number of contractors who would be employed in Project construction, and to ensure a safe environment, amid the anticipated multi-pronged construction effort that would be fully underway later in the year.

Numerous contractors mobilized and established site office trailers and began the hiring of local supervisors and building trades craftsmen.

Quarter 2: Engineering procurement and contract work continued with the issuance of additional purchase orders for items such as booster fans and motors, electrical switch gear and substation equipment.

Numerous meetings were held with the Town of Bow Planning Board in order to receive approvals to construct various buildings and ensure that the plans complied with town ordinance and building code requirements. Major equipment suppliers prepared for initiation of heavier construction later in the year with foundation work and site preparation continuing as the major areas of emphasis. This site work included the installation of numerous underground electrical and piping systems in order to ensure clear access paths by late spring to the work zone for vehicles and heavy equipment. Permits were received from the NHDES Water Division for additional Alteration of Terrain activity as well as from the Air Resources Division for fabrication on-site of large fiberglass reinforced plastic piping for the chimney liner.

Construction work force on-site rose to approximately 150 people during this period.

Large spread-mat foundations were completed for the Scrubber Island. These 8-foot thick foundations were built in a timely fashion to support the critical path schedule.

On June 30, PSNH provided an update on the Project to the Legislative Oversight Committee on Electric Utility Restructuring as well as the chairpersons of the House Science, Technology, and Energy Committee and the Senate Energy and Economic Development Committee. This update included a review of the status of the Clean Air Project engineering, contracts, permits and approvals, site work, schedule, and costs, as well as the U.S. Department of Energy Carbon-Injection Test Program.

Quarter 3: Procurement efforts continued in the summer with a focus on items such as motor control centers, continuous emission monitors, structural steel procurement, duct work

fabrication, uninterruptible power source, expansion joints, cable bus, and many other relatively small contracts.

The engineering staff with URS began to decrease as the peak engineering periods were completed. Construction activities continued to grow with the work force exceeding 175.

Periodic discussions were held with the building trades representatives, URS, and PSNH in order to ensure that there was an open line of communication to discuss work and safety practices, work scope, and staffing plans. This open exchange provided a good forum for questions and answers and open discussions on any issues of interest to the parties present. Building trades generally were represented by one or more personnel from their unions. Contractors were also present in order to provide prompt answers to any questions raised. These meetings consolidated positive relations and provided clarity of work assignments with resulting good productivity from the building trades craftsmen.

The Scrubber contractor had prepared work zones for fabrication of the large absorber vessel. This vessel, which is approximately 50 feet wide and 110 feet tall, is the project component in which boiler exit gasses react with the prescribed water/limestone mixture to remove mercury and sulfur. This large vessel was to be built in place in segments and took approximately one year to complete.

Quarter 4: Numerous contracts were issued during the latter part of 2009 including duct work and steel erection, project distributed control system, and gas duct isolation dampers, among other things.

Engineering activities continued to be brisk although ramping down as construction work and field staffing ramped up. Subsurface and foundation work continued in support of various aspects of the Project, while construction began on the Scrubber building steel framing with work continuing on the absorber vessel rings for eventual installation on the Scrubber absorber.

The internal chimney liner installation was completed as required for future connection to the flue gas absorber vessel.

All major contractors were active on-site with preparation and construction work occurring in the Scrubber area, chimney area, fabrication, and limestone conveyor towers. Numerous other contractors were on-site to support the balance of the Project work.

C. Activities Performed During 2010

Quarter 1: Contract bidding activity continued with issuance of additional contracts.

Various additional building permits were received from the Town of Bow for items such as structural and architectural design of various buildings and conveyor systems, foundations, and building electrical work.

The limestone conveyor system and support towers were structurally and mechanically completed.

Contract work force on-site grew to more than 200 with approximately 200,000 man-hours expended on the Project through this period.

Approximately 50 purchase orders and contracts were active with values totaling more than $275 million.

The overall Project schedule continued to be on track or slightly ahead of schedule which confirmed our confidence in achieving Project completion one year early. Cost management of the Project remained positive, with no projected overruns envisioned.

On March 31, per the Commission's directive, PSNH provided an information update to the New Hampshire Public Utilities Commission staff, Office of Consumer Advocate representatives, and other interested parties. This presentation reviewed PSNH's legal obligation to construct and operate the Scrubber system, and the Legislature's public interest determination, under RSA 125-O:11-18, the Project construction and contract status, overall budget by year, schedule, jobs provided by the Project, and substantial economic value to New Hampshire during an economic recession, as well as the significant environmental benefits of early completion.

Quarter 2: A variety of smaller contracts were awarded in mid-2010 for items such as painting and coatings and balance of plant electrical work. Various equipment tests in factories and at fabrication facilities were successfully carried out as a critical part of URS's overall quality control management program, allowing equipment delivery to the job site to proceed smoothly.

Various local permits were obtained as necessary for activities such as mechanical erection, electrical, structural and architectural design of remaining buildings.

Site work continued for various underground utility installations needed for ongoing work by the Phase II site preparation contractor. The 115 KV yard expansion work began to tie into the permanent new substation to power the Project with testing projected in quarter 3.

Continued erection of the absorber rings proceeded while other rings were being fabricated in adjacent areas to expedite the overall construction schedule. URS's engineering activities and associated work force were reduced to approximately 20% of peak staffing in 2009. Remaining personnel worked on small new assignments as well as design modifications, typical scope requirements, ensuring proper documentation and filing of all information and construction as-built drawing recordings.

The new Unit 1 and Unit 2 combined chimney was completed, and is awaiting testing. Completion of the chimney was critical in that adjacent site work could now proceed without the necessary safety precautions that were in place during chimney construction.

On June 29, PSNH provided its annual update on the Project to the Legislative Oversight Committee on Electric Utility Restructuring, the chairpersons of the House Science, Technology and Energy Committee, and the Senate Energy and Economic Development Committee. This update included a review of the status of the Clean Air Project engineering, contracts, permits and approvals, site work, schedule, and costs.

Quarter 3: The Project's three booster fans were installed on foundations so that duct work could proceed. These fans are in a congested construction zone adjacent to the absorber vessel scrubber structural building and chimney.

The Project celebrated a 500,000 man-hour achievement with no lost time accidents. A safety luncheon was held for the work force to congratulate them on this remarkable achievement. As with all PSNH Generation activities, worker safety has been, and will continue to be, a top priority.

Contracts were awarded for site clean-up and for finalization, start-up electrical testing.

Large construction activities continued with erection of the absorber vessel and its tie-in to the chimney, structural completion of the Scrubber island, and material handling enclosure to make the overall Project weather-tight for indoor piping, electrical, and other work during the winter period. Similar objectives were achieved for the Wastewater Treatment Building, the Gypsum Stackout Building, and other work zones where significant interior work will proceed during the upcoming winter weather period.

The 115KV substation and the station high-yard expansion were completed and were made available for testing.

The two limestone storage silos were structurally completed allowing for internal equipment installation.

The Scrubber absorber vessel shell was completed in preparation for final connection to the chimney and inlet flue gas duct work.

The work force on-site as of the date of this report totals approximately 480 people, over 350 of whom are building trades craft people. At this point of the Project, all necessary construction permits from State, Federal, and local agencies have been received.

II. COST ESTIMATE

PSNH recently announced that the Clean Air Project cost estimate has been reduced from $457 million to $430 million based on current and projected costs. This cost reduction is based primarily on better than planned work force productivity and work quality which was further enhanced due to excellent weather for most of 2010. Also, certain global market based commodities, such as steel alloy materials, have dropped in price. This new cost projection is based on a detailed analysis of work completed and work remaining; contract

commercial, technical and field status; and current knowledge of all remaining activities. With some engineering and procurement risks eliminated at this stage of the work, coupled with good project management which has avoided added expenditures, PSNH is highly confident of this new estimate.

To date, purchase orders and contracts have been issued with values totaling $317.2 million. Approximately 46 additional, comparatively small purchase orders and contracts are currently envisioned to be released over the next few months with total values of about $6-8 million.

The remaining effort for 2010, 2011, and 2012 will focus on critical schedule supporting tasks. The expenditure level for 2010 is currently projected to be approximately $151.5 million and $77.8 million is currently estimated for 2011.

III. ENERGY SERVICE RATE CHANGE

PSNH anticipates that the Clean Air Project will be operational in mid-2012. That initial year of operation, 2012, will see the ES rate increase effective July 1, 2012, reflecting the Project being used and useful in providing utility service to PSNH's retail customers. (See RSA 378:30-a).

Based upon our best estimates of project cost, timing, accounting and regulatory matters, and the assumptions set forth below, we forecast the overall average impact on ES rates from the Project for the first full 12 months of service to be $0.011/kWh. The first year of operation will see the highest cost impact as the book value of the project will be at its highest level, and will decline over the depreciated life of the project. The overall comparative average increase to ES rates for the three years following the initial year of service are as noted below:

Year 1	July 2012 – June 2013	$0.011 per kWh (initial year of service)
Year 2	July 2013 – June 2014	0.011
Year 3	July 2014 – June 2015	0.010
Year 4	July 2015 – June 2016	0.009

The primary assumptions used as inputs to the revenue requirements analysis include:

Capital costs: $430 million

Capital structure: approximately 48%/52% debt to equity ratio.

Assumed Return on Equity: 9.81% (PSNH's currently allowed ROE on generation)

In-service date: July 1, 2012

Deferred taxes: PSNH has assumed that 100% of the project costs would be eligible for liberalized (accelerated) tax depreciation, creating deferred taxes. These deferred taxes were applied against the rate base value of the project, as an overall reduction to rate base, and therefore have reduced the overall return in these calculations.

Forecasted data: PSNH's most recent 5 year forecast (2011 – 2015) was used as a starting point for our analysis. This forecast deck was updated to reflect the most recent costs associated with all of the products embedded in providing full requirements service as well as use of the latest sales data. The following assumptions were also used:

	2012	2013	2014	2015
Peak Energy* ($/MWh)				
NYMEX	54.46	56.70	58.93	61.70
EVA	64.73	67.31	70.28	73.83
Off-Peak Energy* ($/MWh)				
NYMEX	42.06	43.58	46.57	48.57
EVA	50.08	51.88	55.70	58.28
New England Delivered Natural Gas* ($/MMbtu)				
NYMEX	5.50	5.69	5.85	6.03
EVA	6.56	6.77	6.99	7.22
Capacity ($/kW-month)**	3.00	2.73	2.78	2.84
MA Class I REC Prices ($/MWh)	20.00	20.51	21.02	21.56
SO_2 ($/ton)	215.00	110.00	110.00	110.00
No_x ($/ton year round)	50.00	25.00	25.00	25.00
RGGI ($/MWh)	2.00	2.00	2.00	2.00

Notes:

* ES model uses a blend NYMEX and EVA

** Includes a peak energy rent of $0.22/kw-month

These estimates reflect recent changes in the energy and environmental marketplace and are higher than those forecasted by PSNH two years ago. There are two primary drivers for this increase. First, ES sales levels have dropped significantly over the past two years, from an

annual level of over 8 million MWh to 5½ million MWh, due to the weakened economy, conservation efforts, and customer migration to competitive suppliers. This drop in sales accounts for at least $0.003 per kWh of the increase. Secondly, the avoided costs associated with SO_2 emissions reductions have decreased significantly over the past 2 years, consistent with the decrease in the price of SO_2 allowances. The avoided costs value of reduced SO_2 emissions was approximately $30 million per year two years ago and is now approximately $3 million per year. This change in SO_2 emissions reduction value also accounts for at least $0.003 per kWh of the increase.

IV. ENERGY SERVICE RATE CHANGE WITHOUT MERRIMACK STATION

Two ES financial scenarios were run comparing Base Case (with Merrimack Station) to Change Case (without Merrimack Station). The comparison values are through the year 2015.

BASE CASE

Summary of Forecasted Energy Service Cost	2011 (Note 1)	2012	2013	2014	2015
Fossil energy costs	$ 145,689	$ 168,553	$ 150,070	$ 161,564	$ 170,333
F/H O&M, depreciation & taxes	152,339	163,884	170,294	178,565	170,072
Return on rate base	43,187	69,468	92,983	92,317	90,908
ISO-NE ancillary	6,624	25	(1,065)	(1,067)	(1,123)
Capacity	13,806	12,803	11,886	11,686	10,807
NH RPS	10,808	12,248	13,764	15,828	17,349
RGGI costs	3,707	7,744	6,680	7,207	7,560
Vermont Yankee	7,602	1,837	-	-	-
IPP costs	28,836	31,354	33,254	34,999	34,392
Purchases and sales (Note 2)	56,830	37,172	72,105	67,124	68,366
2009 ES Over/Under Recovery	(1,482)	(70)	(1)	-	-
Total Forecasted Energy Service Cost	$ 467,946	$ 505,018	$ 549,970	$ 568,223	$ 568,664
Forecasted Retail MWH Sales	5,389,252	5,449,842	5,481,127	5,544,882	5,616,530
Forecasted Energy Service Rate - cents Per KWH	8.68	9.27	10.03	10.25	10.12

Note 1 - As filed 9/21/10 Docket DE No. 10-257
Note 2 - Purchases and Sales reflect credit adjustments for Rental Revenue, HQ Revenue, and Domestic Manufacturing Deduction Credits.

CHANGE CASE
Summary of Forecasted Energy Service Cost

	2011 (Note 1)	2012	2013	2014	2015
Fossil energy costs	$ 145,689	$ 98,218	$ 35,532	$ 35,375	$ 37,374
F/H O&M, depreciation & taxes	152,339	159,749	139,569	145,883	142,105
Return on rate base	43,187	69,158	91,290	88,838	85,912
ISO-NE ancillary	6,624	(2,874)	(6,574)	(7,455)	(8,123)
Capacity	13,806	20,455	24,946	25,462	25,680
NH RPS	10,808	12,248	13,764	15,828	17,349
RGGI costs	3,707	4,483	1,178	1,166	1,243
Vermont Yankee	7,602	1,837	-	-	-
IPP costs	28,836	31,354	33,254	34,999	34,392
Purchases and sales (Note 2)	56,830	119,031	225,078	242,098	259,049
2009 ES Over/Under Recovery	(1,482)	(70)	(1)	-	-
Total Forecasted Energy Service Cost	$ 467,946	$ 513,589	$ 558,036	$ 582,194	$ 594,981
Forecasted Retail MWH Sales	5,389,252	5,449,842	5,481,127	5,544,882	5,616,530
Forecasted Energy Service Rate - cents Per KWH	8.68	9.42	10.18	10.50	10.59
BASE CASE cents per KWH	8.68	9.27	10.03	10.25	10.12
Change from Base Case cents per KWH	-	0.15	0.15	0.25	0.47

Note 1 - As filed 9/21/10 Docket DE No. 10-257
Note 2 - Purchases and Sales reflect credit adjustments for Rental Revenue, HQ Revenue, and Domestic Manufacturing Deduction Credits.

The primary assumptions used as inputs to this analysis include:

Forecasted data: consistent with the assumptions noted in Section III, above.

Capital costs: all embedded capital costs and the related depreciation and property taxes are contained in both the Base Case and Change Case. These costs would be recoverable from customers regardless of the hypothetical assumptions applied to the without Merrimack Station Change Case.

This analysis indicates that if Merrimack Station was not in the mix of fossil and hydro facilities operated by PSNH, energy service rates would be higher.

V. THE CURRENT STATE OF THE ELECTRIC POWER MARKETS, PSNH'S FORECAST OF POWER MARKET PRICES, AND HOW THE SCRUBBER PROJECT CONFORMS TO PSNH'S LEAST COST INTEGRATED RESOURCE PLAN.

A. The Current State of the Electric Power Markets

To comply with requirements of the Federal Energy Regulatory Commission, ISO-New England prepares periodic reports regarding key statistics for the region's wholesale electric power markets. Its quarterly reports for 2010 are publically available from the ISO-NE website at:

http://www.iso-ne.com/markets/mkt_anlys_rpts/qtrly_mktops_rpts/

Each year, ISO-NE also reviews the performance, competitiveness and efficiency of the region's wholesale electricity markets. ISO-NE's May, 2010, report is available at:

http://www.iso-ne.com/markets/mkt_anlys_rpts/annl_mkt_rpts/index.html

B. PSNH's Forecast of Power Market Prices

PSNH does not forecast market prices for power. However, the assumptions PSNH used in its analyses of Energy Service rates in Sections III and IV, were detailed in Section III.

C. How the Scrubber Project Conforms to PSNH's Least Cost Integrated Resource Plan

PSNH must comply with applicable laws, regulations, and administrative orders. RSA 374:41 allows the Commission to direct the Attorney General to immediately begin an action in the name of the state praying for appropriate relief whenever a public utility is failing or omitting, or about to fail or omit, to do anything required of it by law. The mandate to install scrubber technology imposed by law in RSA Chapter 125-O is express and unequivocal, and PSNH has a duty to comply. Hence, as a matter of law, the Company's Clean Air Project must be deemed consistent with the energy policy set forth in RSA 378:37, which forms the basis for each utility's biennial least cost plan.

The Clean Air Project's installation of scrubber technology was in fact included in PSNH's most recently approved Least Cost Integrated Resource Plan, which was reviewed and accepted by the Commission in Docket No. DE 07-108. Indeed, the scrubber was the first matter highlighted in that Plan, appearing as the first bulleted paragraph on the first page of that Plan's Executive Summary. The scrubber was discussed at length in that Plan's Section XII, "Assessment of the Plan's Long- and Short-Term Environmental, Economic, Energy Price, and Energy Supply Impact on the State."

On September 30, 2010, PSNH submitted an updated Least Cost Integrated Resource Plan. Discussion of the scrubber installation mandate was similarly discussed therein. In addition to its inclusion in the Plan's Executive Summary, the Clean Air Project was included in the Plan's "Assessment of Supply Resources," "Fuel Procurement Strategies," "Assessment of Plan Integration and Impact on State Compliance with the Clean Air Act Amendments of 1990," and "Assessment of the Plan's Long- and Short-Term Environmental, Economic, Energy Price, and Energy Supply Impact on the State."

PSNH PRESS RELEASE

Public Service of New Hampshire
The Northeast Utilities System

Clean Air Project
Merrimack Station

PSNH News

Press Release

Contact: Martin Murray, Senior Corporate News Representative
(603) 634-2228, murrame@psnh.com

Release: 10-1001

For Immediate Release:

Clean Air Project Progress Report - 75 Percent Complete

Mercury Reduction System Ahead of Schedule and Below Budget

BOW, NH, October 7, 2010***The "scrubber" at Merrimack Station -- which will significantly reduce PSNH's mercury and sulfur emissions -- will be finished one year earlier than required by law, and will be completed under budget. A productive workforce and favorable weather conditions have led to a savings of both time and money.

"The project is progressing exceptionally well," noted Bill Smagula, PSNH Director of Generation. "We are currently in the major construction phase, with about 350 skilled craft workers on site. The building trades workforce is very productive, and the quality of work is exceptional. That has been one of the big reasons that we have revised our overall project cost estimate downward and set a new, earlier, completion date."

"Considering our struggling economy and the high level of unemployment facing the state's construction industry, this project has come at a critical time for many New Hampshire working families," said Joe Casey, president of the NH Building Trades Council. "This project is an excellent example of the professionalism of the state's building trades, and how our partnership with PSNH has resulted in a project that is on time, under budget and of the highest quality."

According to Smagula, the Clean Air Project will be complete and operating by July, 2012, one year ahead of the deadline set out by the State. The price estimate of the scrubber system has been reduced to $430 million from $457 million. The savings is the result of the high productivity of the workforce, favorable weather conditions that helped avoid delays, and certain commodity cost reductions. The early completion will provide for cleaner air sooner and lower costs to customers.

The installation of a "wet flue gas desulfurization system" at Merrimack Station was mandated by the State of New Hampshire in 2006 (RSA 125-O:11) and is aimed at reducing emissions of mercury and other pollutants. The scrubber will remove more than 80 percent of the mercury and more than 90 percent of sulfur emissions from the flue gases of the coal-fired power plant.

About Public Service of New Hampshire: *PSNH is New Hampshire's largest electric utility, generating and distributing clean electricity for more than 490,000 homes and businesses in an environmentally friendly manner.*

Follow PSNH On:
Twitter | Facebook | YouTube | Flickr

psnhnews.com