

ORIGINAL	
N.H.P.U.C. Case No.	DE 11-250
Exhibit No.	# 39 PSNH
Witness	Thomas C. Frantz
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Public Service Company of New Hampshire
DE 11-250

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Witness	
Exhibit No.	
N.H.P.U.C. Case No.	
ORIGINAL	

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC - 1-5

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Please identify any and all persons who were present for the presentation which PSNH made to Staff and the Office of Consumer Advocate on or about July 30, 2008, which presentation was referred to in the PSNH response to data request TransCanada 4-24 in this docket, or for any other presentations PSNH made to Staff.

RESPONSE:

In attendance at the July 30, 2008 presentation:

<u>PSNH:</u>	John McDonald, Steve Hall, Linda Landis, Terry Large, Lynn Tillotson
<u>Staff:</u>	Tom Frantz, George McCluskey, Steve Mullen, Anne Ross
<u>OCA:</u>	Meredith Hatfield, Ken Traum

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-6

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Please provide copies of any and all documents in the possession of Staff related to the meeting or meetings referred to in question 4 above, including, but not limited to, any correspondence including any emails or other forms of correspondence between and among Staff, the OCA and PSNH representatives or any other persons present at this meeting, any notes kept by any Staff members in attendance at this meeting, and any other related documentation.

RESPONSE:

Attached is my copy of the July 30, 2008 presentation including my handwritten notes on the presentation as well as additional notes taken by me.

It is important to understand that the July 30, 2008 meeting was in the nature of PSNH providing Staff and OCA a confidential briefing as to the status of the project including the increased costs in advance of public disclosure. The Electric Division consistently instructs the electric utilities to inform us of newsworthy events either in advance or as soon as the possible after the event has occurred (depending on the nature of the event) so we will not be surprised by potential media or customer inquiries. The July 30, 2008 meeting was not a meeting designed to provide Staff with all justifications or analyses related to the scrubber project.



**Public Service
of New Hampshire**

The Northeast Utilities System



Clean Air Project

Merrimack Station

Public Service Company of New Hampshire Clean Air Project

Update to NHPUC Staff and
Office of Consumer Advocate

July 30, 2008

Privileged and Confidential

Purpose of Today's Meeting

- Recap NH Clean Power Act and Mercury Law requirements
- Define Merrimack Station benefits to PSNH customers
- Advise as to project status within NU/PSNH
- Update cost estimates
- Confirm financial assessment of customer benefit post-scrubber installation
- Provide current thinking on project schedule

Executive Summary

- New Hampshire legislation mandates compliance with mercury emissions standards set forth in the NH Mercury Reduction Law
 - PSNH must capture 80% of mercury emissions from its coal plants by June 2013 *- We need 85% from Merrimack to cover the entire fleet*
 - Wet scrubber technology will reduce power plant mercury emissions required by New Hampshire law and is the technology specified by the law
 - There is no other technology that will guarantee capture of 80% of the mercury input of our coal fleet
 - On behalf of its customers, PSNH is incented to reduce mercury emissions prior to June 30, 2013
- Cost estimates have been defined by a competitive bidding process
 - Prices have escalated from original estimates made in 2006 due to much higher raw material pricing and higher costs of engineering services and labor *Steel*
- Bid proposals indicate that an in-service date of mid-2012 is achievable
 - Earlier in-service date reduces cost (AFUDC) and risks, and allows PSNH's customers to take advantage of incentives built into the New Hampshire legislation for "early reductions" of mercury
- Despite the capital cost increases, Merrimack Station remains economic for customers under expected conditions
 - *over 15 year life*
The NPV of Revenue Requirements of adding the scrubber versus replacing Merrimack Station energy and capacity supply with market purchases is a benefit to customers of \$132 million
- In addition to the mercury removal benefits, the scrubber avoids about 30,000 tons of sulfur emissions and sulfur allowance purchases annually, included in the customer benefit above





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Clean Air Project
Merrimack Station

Background

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MKS's air scrubber cost $\approx 64/\text{kwh}$
(2007-2013)



Merrimack Station Benefits PSNH's Customers

- Merrimack Station produces 3 million MWh of low-cost power annually, about 35% of PSNH's total energy service requirement. The low-cost energy produced at Merrimack Station offsets the higher cost of market purchases in the overall energy service rate
- Historic high Capacity Factor and cost-effective operation of Merrimack Station has been one of the major reasons why PSNH's energy service rate is the lowest in the region, as much as 25% lower than the region's average energy service rate
- Merrimack Station has control technology to satisfy NO_x and particulate emissions requirements. With a scrubber, SO₂ and mercury emissions will be controlled and Merrimack will be among the cleanest coal-burning plants in the nation
- Coal is the most abundant domestic fossil fuel resource in the United States, supplying more than 50% of the nation's power generation, but only 15% of New England's generation. Maintaining the use of this secure fuel resource is important for the diversity of the region's future energy supply
- Historically, coal has maintained a price advantage over oil or natural gas as a fuel source for the power generation sector. Operated as regulated generation, this cost savings flows directly to customers

Continued operation of Merrimack Station with a scrubber will maintain fuel diversity and security of domestic fuel supply in the ISO-NE region, while providing PSNH's customers with low-cost energy.



Regional Barriers to Adding New Base-Load Generation in New England Cause Merrimack Station to be Strategically Positioned for Re-Investment

- New base-load power plants (coal, nuclear, IGCC) are not on the near- or mid-term horizon for the region, making re-investment in environmental technology at existing assets the necessary strategy to maintain appropriate base-load supply
- In addition to the support these barriers provide for continued operation of existing base-load plants:
 - Study done for Connecticut Energy Advisory Board
 - Brattle Group analysis of future NE energy markets indicates that all coal generation, including Merrimack, will continue to operate economically (take into account recent environmental laws and PSNH's scrubber requirement)
 - Operation of Merrimack Station on coal increases NE's fuel diversity, enhancing the stability of power supply in the region
- ISO-NE market rules, and the current economic climate, make it nearly impossible for prospective generators to secure financing and overcome the substantial "barriers to entry" to build new generation in the region





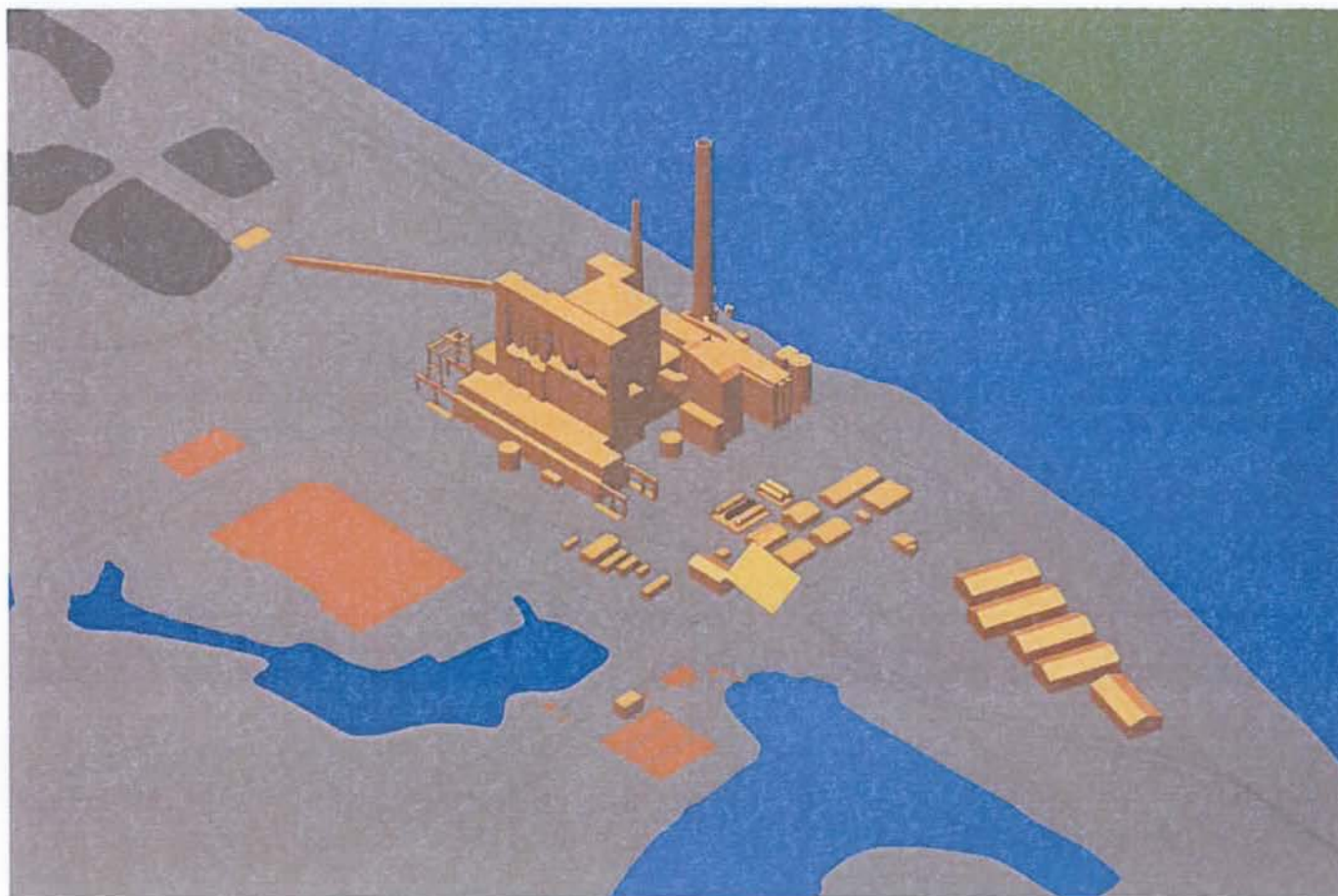
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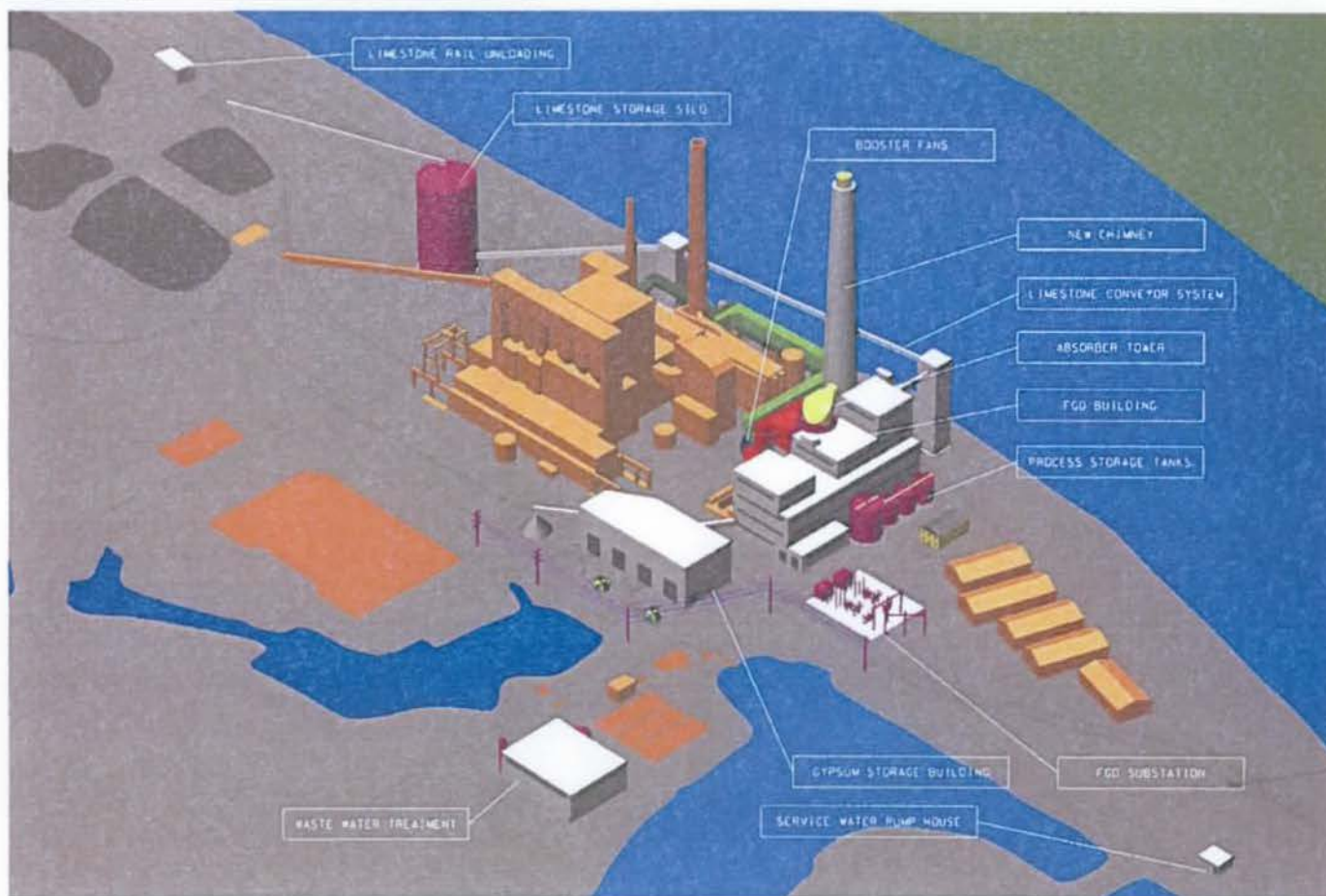
Project Status Update

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Merrimack Station: 2008



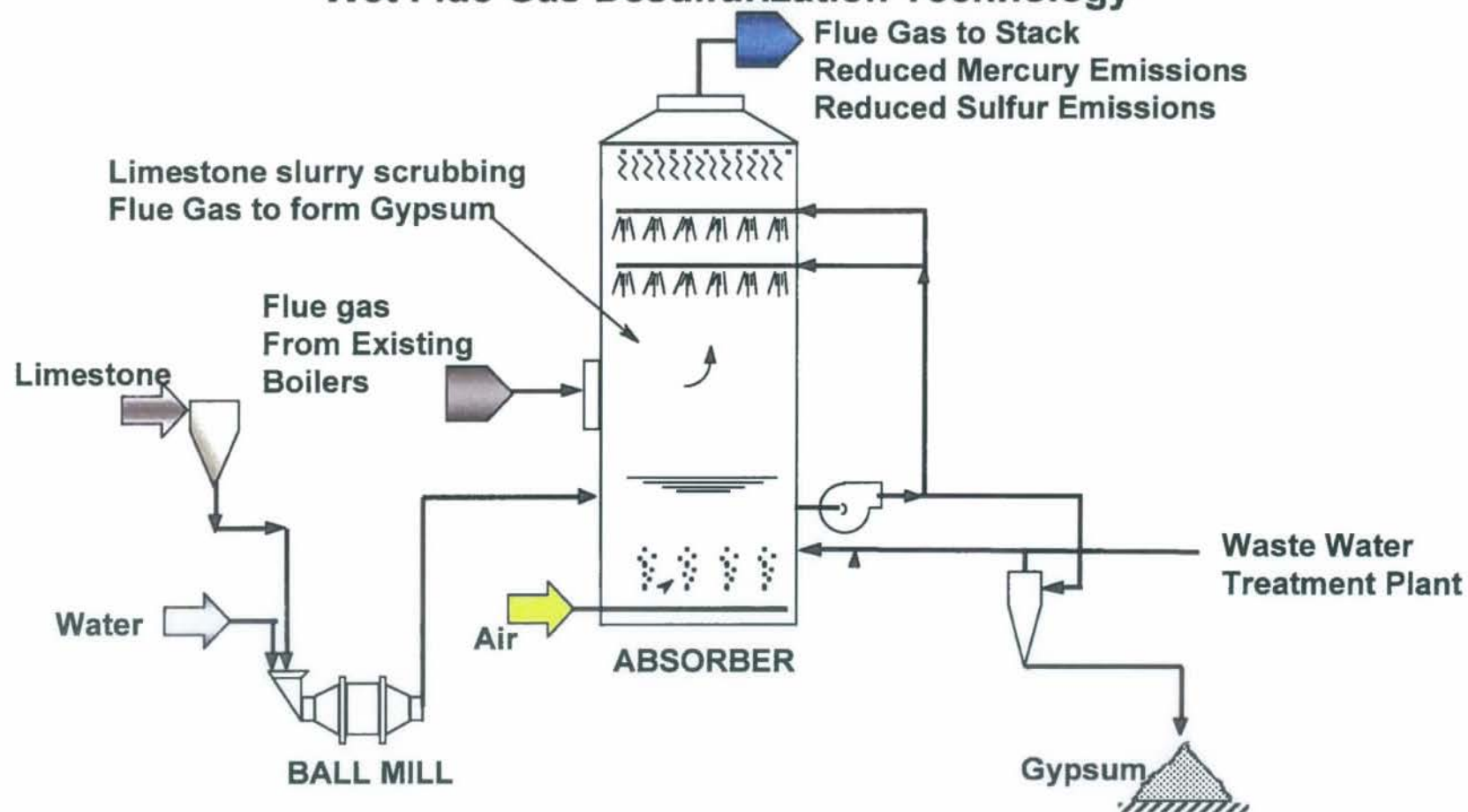
Merrimack Station: 2013



*to the auxiliary
power requirements
of FGD*

Scrubber Schematic

Wet Flue Gas Desulfurization Technology



Clean Air Project – Progress to Date

- **Engineering**
 - Projects defined in 5 major components
 - Specifications developed for 4 key components
- **Commercial and Purchasing**
 - Program Manager hired September 2007
 - Scrubber Island and Chimney proposals are in ^{final} negotiations
 - Wastewater Treatment Facility and Material Handling System bids are in negotiations
- **Review, Permits, and Approvals**
 - Temporary Air permit application to NHDES, June 2007
 - NHDES – May 12 presentation
 - Temporary Air Permit expected October 2008
 - Town of Bow – local permitting
 - Regional Planning Commission
- **Site Work**
 - Existing oil tank removed
 - Site surveys and studies completed
 - Warehouse construction underway
 - On-site engineering facilities completed
- **Costs and Schedule**
 - Project costs now updated with review of all major equipment bids nearing completion
 - Original plan: Tie-ins: MK#1 Fall 2012, MK#2 Spring 2013
 - Program Manager and suppliers can support in-service one year earlier



→ Tie-In
→ will be incorporated into the ~~the~~ regular scheduled maintenance cycles.

Estimate of Project Costs

- Project estimated to cost \$457M
 - Estimate based on firm price bids, currently in final phase of negotiations
 - Cost components:

→ Major Components (FGD, Material Handling, Wastewater Treatment and Chimney)	\$173M
→ PSNH and Program Manager Costs (Engineering)	\$170M
→ Project Contingencies	\$ 52M
→ Corporate Costs (AFUDC, Indirects) ^{*\$7M} ^{*\$5M}	<u>\$ 62M</u>
TOTAL Project Costs	\$457M

Key Drivers of Project Cost Increase

- Scrubber design criteria for Mercury vs. SO₂
- Material cost increases *- substations/transformers / pre-weld steel*
- Labor cost increases
- Engineering, including site congestion and interconnection of two dissimilar sized units into one scrubber



Clean Air Project
Merrimack Station

✓
✓
✓



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Project Benefits

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Financial Assessment

- Though environmental stewardship comes with a cost, PSNH has determined that continued operation with the scrubber installation is in the best interest of customers
 - NPV of customer benefit \$132M
 - Monthly residential customer cost impact vs. alternative creates a \$1.01 savings
 - 2013 Station Busbar Cost \$94.55/Mwh → *compared to \$60/Mwh today*

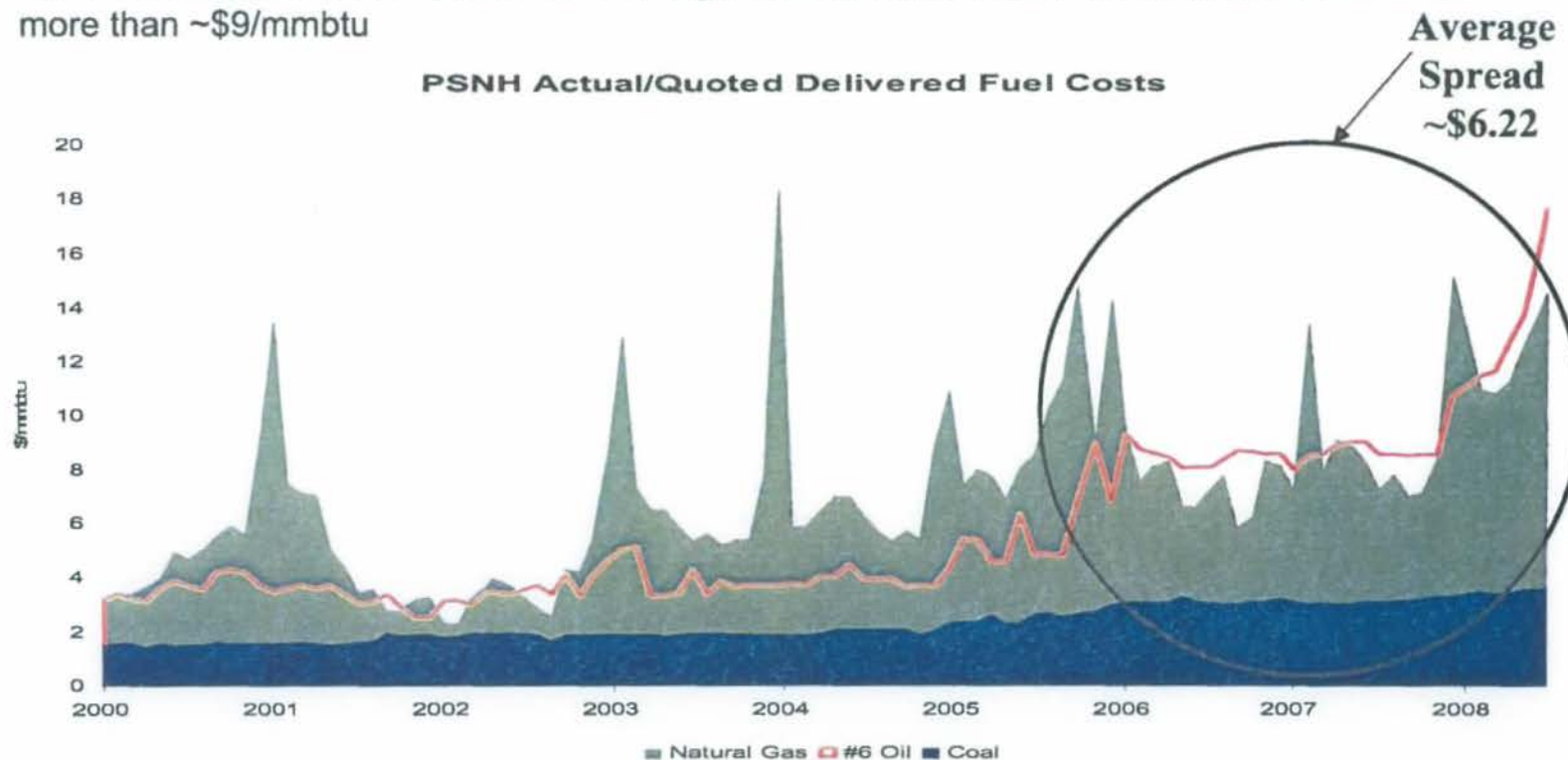
- Assumptions used in performing this analysis
 - Capital Cost \$457M
 - 2012 Natural Gas Price \$11.00/MMbtu *7500/00/hour unit*
 - 2012 Coal Price \$4.82/MMbtu
 - 2012 Carbon Cost (RGGI) \$7.00/ton

- Our analysis shows that customer economics are most sensitive to the Coal/Natural Gas price spread and far less sensitive to capital cost or RGGI cost increases



Historic Fuel Spreads

- Gas/Coal spread has historically favored coal over natural gas and the spread has averaged \$6.22/mmbtu since the hurricane season of 2005
- Since January 2007, the spread has averaged nearly \$6.63/mmbtu and current spreads are more than ~\$9/mmbtu



PSNH believes that coal, the nation's most plentiful domestic fuel resource, which is best suited for stationary (power generation) use, will continue to find ways to be lower cost than alternatives that are influenced predominantly by foreign supply



Project Benefits are Accentuated by Advancing the In-Service Date to Mid-2012

➤ Economic

- Reduces AFUDC cost by \$10 million
- Limits exposure to material or labor cost escalation for project elements not covered by firm price contracts

➤ Environmental

- Eliminates an additional 31,350 tons of SO₂
- Eliminates an additional 229 pounds of mercury
- Reduces particulate emissions to less than 1% one year sooner

➤ Customer

- Produces "early reduction mercury credits" that can be used for:
 - Compliance in future years if operational issues with the scrubber arise
 - Conversion to fungible SO₂ allowances (estimated at 12,500 allowances)

→ used \$500 SO₂ allowance price
(as compared to \$573/\$1073/\$1573 used at time of negotiating the law)



Conclusion

- Installation of the scrubber is required by NH law to meet mercury emissions requirements
- PSNH has made significant progress, including the hiring of a Program Manager, initial permitting, and negotiation of contracts
- Merrimack Clean Air Project capital costs have increased since the original project cost estimates were prepared in 2006, following the global trend for all commodities and energy, and stand at \$457M
- PSNH analysis supports that the construction and operation of a scrubber at Merrimack Station, in conformance with the NH Mercury Reduction Law, is in the best interest of PSNH's customers
- State law allows for recovery of prudently incurred costs to construct and operate the scrubber
- The project team continues to execute contracts and will begin construction in earnest late this year, with a now proposed project in-service date of mid-2012



7-30-08 Meeting w/PSNH re: Merrimack Scribner Project

PSNH - Hall, McDonald, Landis, Lange, Tillotson

OCA - Hatfield, Traut

Staff - Mullen, McCluskey, Frantz, Ross

8/4 → 10-Q to be issued

- Rec'd commitment from Board of Trustees

- 4 major contractors

→ Project Manager = The Washington Group

→ 6/18 - Legislative Briefing

→ Discussed permits with DES

McDonald - Have an "extreme confidence in the project"

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-7

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Please provide a copy of any materials that were provided to Staff associated with this meeting or meetings, either before, during or after the meeting or meetings.

RESPONSE:

See the response to TC 1-6.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-8

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Reference page 14 of Mr. Mullen's testimony, lines 9-19, please explain your understanding of the statements in the presentation PSNH representatives made to the Board of Trustees that the relationship between the price of natural gas and the price of coal was critical to whether the project would be economic for ratepayers.

RESPONSE:

The July 15, 2008 presentation to the Board of Trustees made by PSNH and NU personnel included statements indicating that in assessing the benefit or cost to customers of comparative alternatives for securing equivalent energy and capacity as produced by Merrimack Station, such assessments were most sensitive to the relationship between the price of natural gas and the price of coal. While that spread was a key factor in determining customer benefit/cost, it was not the only factor, and it was based on consideration of a number of interdependent components.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-9

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Reference page 14 of Mr. Mullen's testimony, lines 9-19, please explain your understanding of the statements in the presentation PSNH representatives made to the Board of Trustees that net ratepayer or customer cost, or what they equated with "net present value" (the 2008 present value of Merrimack Plant revenue requirements from 2012-2027 minus the 2008 present value of market energy plus 2008 present value of capacity payments from 2012-2027) was most sensitive to expected future natural gas and coal prices.

RESPONSE:

See the response to TC 1-8.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-10

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Reference page 14 of your Mr. Mullen's testimony, lines 9-19, please explain your understanding of the statements in the presentation PSNH representatives made to the Board of Trustees that at assumed 2012 price levels, a spread of \$5.29/mmbtu (escalating) between natural gas and coal over the course of the next 15 years would be "required to create customer benefits."

RESPONSE:

See the response to TC 1-8. In addition, I note the question left out some relevant wording. The entire referenced bulleted item from that presentation reads as follows: "At assumed 2012 natural gas and coal price levels *and other base case parameters*, a spread of approximately \$5.29/mmbtu (escalating) is required to create customer benefits." (emphasis added). Therefore, I understand the spread to be the result of the consideration of a number of factors rather than a simple comparison of natural gas and coal prices.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-11

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Did PSNH provide the information referred to in questions 8, 9 and 10 above in the meeting with Staff and others on July 30 or any other meetings? If so, please provide any and all documentation indicating that any of this information was presented during that meeting or meetings.

RESPONSE:

Page 15 of the July 30, 2008 presentation contains the following bullet point: "Our analysis shows that customer economics are most sensitive to the Coal/Natural Gas price spread and far less sensitive to capital cost or RGGI cost increases."

In addition, see the response to TC 1-5 where the nature of that meeting is explained.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-12

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Did PSNH present the information referred to in questions 8, 9 and 10 above to the Commission in DE 08-103? If so, please provide any and all documentation indicating that any of this information was presented to the Commission in that docket.

RESPONSE:

All documents filed in DE 08-103 are available to TransCanada at:
<http://www.puc.nh.gov/Regulatory/Docketbk/2008/08-103.htm>

In response to the question, I provide the following information. I have not, however, performed a search of all documents filed in that docket.

Regarding questions 8, 9 and 10, the following information was provided to the Commission in DE 08-103:

PSNH's September 2, 2008 Report to the Commission:

- Page 14 – “D. Sensitivity analyses were conducted to test the impact of changes to each of the key assumptions (capital cost, coal cost and equivalent CO₂ allowance cost) on the overall bus bar cost of Merrimack Station. These sensitivity analyses indicated the economics of the project are most sensitive to variations in the future price of coal, and far less sensitive to variations in the capital cost or equivalent CO₂ allowance cost.”
- Pages 14 – 16. PSNH explained its methodology and provided its coal and gas price assumptions used in evaluating scenarios involving market purchases and construction of new coal and natural gas generating stations. Clearly, coal and natural gas price assumptions were important factors in those analyses.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-27

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Reference page 15, lines 15-20 of Mr. Mullen's testimony, would not the decline in the average natural gas prices noted in this portion of your testimony make the scrubber project uneconomic according to PSNH's own analysis presented in its June and July 2008 presentations to the Risk and Capital Committee and Board of Trustees?

RESPONSE:

Changing only one factor in an analysis while leaving the others unchanged would be an overly simplistic and inappropriate evaluation. As stated in the response to TC 1-8, PSNH's analyses were performed using a number of interdependent components. It is unrealistic to assume that a change in one component would not necessitate a change in another component.

For instance, PSNH's analyses used a \$4.82/mmBtu coal price based on a (\$130/ton delivered price) escalated 2.5% annually. In PSNH's most recent energy service rate proceeding, its delivered coal prices were roughly \$100/ton. Using the same Btu/lb content for the coal, that would change the \$4.82/mmBtu price to \$3.70/mmBtu. I use this as an example to show that given the dynamic fuel and energy markets, it is unrealistic to assume that a change in one cost component would not necessitate a change in other components.

**Public Service Company of New Hampshire
DE 11-250**

NH PUC Staff Responses to Data Requests of TransCanada

Date Received: January 21, 2014
Request: TC – 1-37

Date of Response: February 14, 2014
Witness: Steven E. Mullen

REQUEST:

Reference the PSNH response to data request Staff 2-2, p. 37 of 50, what data would Mr. Mullen review to know whether "the required customer break-even level of \$5.29" gas/coal spread was achieved?

RESPONSE:

The referenced page states that the break-even level of \$5.29/mmbtu was "based on current price levels" with "current" meaning at the time the presentation was prepared, i.e., mid-2008. Further, on page 38 of that presentation, it states that the \$5.29/mmbtu gas/coal spread is based on "assumed 2012 natural gas and coal price levels *and other base case parameters*" (emphasis added). Those other parameters include carbon costs, capital costs and environmental costs. So, one would have to look at all of the interdependent factors that went into the development of the gas/coal spread.