STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET DE 16-542

IN THE MATTER OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE D/B/A EVERSOURCE ENERGY ANNUAL RECONCILIATION OF ENERGY SERVICE AND STRANDED COSTS FOR 2015

DIRECT TESTIMONY

OF

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WILLIAM M. WILLIAMS
CONSULTANTS TO STAFF

DECEMBER 15, 2016

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Introduction

Q. Mr. DiPalma, please state your name and business address.

A. My name is Frank Thomas DiPalma. I am employed by Williams Consulting, Inc. My business address is 450-160 State Rd. 13 N. #112 St. John's, FL 32259.

Q. Mr. Williams, please state your name and business address.

A. My name is William Martin Williams. I am employed by Williams Consulting, Inc. My business address is 450-160 State Rd. 13 N. #112 St. John's, FL 32259.

Q. Mr. DiPalma, what position do you hold at Williams Consulting?

A. I am currently a Vice President.

Q. Mr. Williams, what position do you hold at Williams Consulting?

A. I am currently a Vice President.

Q. Mr. DiPalma, what are your background and qualifications for your testimony in this proceeding?

A. I have over 40 years of professional experience and have been a utility industry consultant for the last 15 years. In addition to Williams Consulting, my consulting experience includes employment with Jacobs Consultancy as Director and Stone & Webster as Associate Director. My direct utility operating experience has been gained from being employed as an officer, manager, or engineer for Public Service Electric & Gas Company and Mountaineer Gas Company. My consulting assignments include numerous power plant outage assessments electric utilities and litigation support for various proceedings. Other project experience includes management and compliance audits, due diligence reviews, prudence reviews, and economic viability and financial studies. I have worked with utilities, public service commissions, attorney generals, and public advocates in Arizona, California,

Connecticut, Delaware, Indiana, Illinois, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Texas, and Washington.

I am a graduate of New Jersey Institute of Technology with a degree in Mechanical Engineering and Fairleigh Dickinson University with a Master's in Business Administration.

Q. Have you included a more detailed description of your qualifications?

A. Yes, a copy of my resume, which includes a list of electric and gas utility clients and commission-requested assessments, is attached to this testimony as Exhibit WCI-1.

Q. Have you previously testified before the New Hampshire Public Utilities Commission?

A. Yes, in 2014 I testified before the New Hampshire Public Utilities Commission in relation to the Public Service New Hampshire Clean Air Project at Merrimack Station.

Q. Mr. Williams, what are your background and qualifications for your testimony in this proceeding?

A. I have over 30 years of professional experience and have been a utility industry consultant for the last 21 years. In addition to Williams Consulting, my consulting experience includes employment with Jacobs Consultancy and Stone & Webster as an executive consultant. My direct utility operating experience has been gained from being employed as Assistant Manager of Power Production at City of Lakeland Electric Department. My consulting assignments include numerous power plant outage assessments and litigation support for various proceedings. Other project experience includes management and compliance audits, due diligence reviews, prudence reviews, and economic viability and financial studies. I have worked with utilities, public service commissions,

attorney generals, and public advocates in, California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Nevada, Texas, and Utah. I am a graduate of Saint Leo University with a degree in Business Administration and have completed courses from Saint Leo University for a Master's in Business Administration.

Q. Have you included a more detailed description of your qualifications?

A. Yes, a copy of my resume, which includes a list of electric and gas utility clients and commission-requested assessments, is attached to this testimony as Exhibit WCI-2.

Q. Have you previously testified before the New Hampshire Public Utilities Commission?

A. No, but I supported DiPalma-Dalton testimony before the New Hampshire Public Utilities Commission in relation to the Public Service New Hampshire Clean Air Project at Merrimack Station.

Q. On whose behalf are you testifying?

A. We are testifying on behalf of the Staff of the New Hampshire Public Utilities Commission (Commission).

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of our testimony is to review and analyze the revenue and expense reconciliation of the Default Energy Service for Public Service Company of New Hampshire's (PSNH or company) d/b/a Eversource Energy (Eversource or EE) fossil and hydro generating assets in 2015. Our review encompassed assessing PSNH's purchases and sales of replacement power and capacity to augment its own generation supply; and gaining an understanding of the performance of PSNH's fossil-hydro

generation units, more specifically assessing the capital and operations & maintenance expenditures and examining the cause and duration of outages and recommending any disallowances and/or operational changes related to those outages. In addition, we were asked to review an event that affected the company's day-ahead offers for the August 31, 2015 dispatch of three units in the New Hampshire Load Zone of ISO New England.

Summary of Testimony

Q. Please summarize your conclusions and recommendations.

A. As a result of our review and analysis of the 2015 revenue and expense reconciliation of the Default Energy Service (ES) for PSNH's fossil and hydro generating assets and the dispatch event, we have the following conclusions and/or recommendations:

1. Accept PSNH's filing as an accurate representation of the energy and capacity purchasing and sales process, and transactions that took place in 2015.
2. Due to reduced capacity factors and to ensure reliability, PSNH has demonstrated the willingness and the capability of making needed adjustments to its operations and maintenance programs.
3. In recognition of the age of their units, required operational duty cycle and good utility practice, PSNH is currently spending sufficient funds for capital replacement, improvement and maintenance projects to assure continued high performance of its generating units.
4. The energy purchase costs associated with the dispatch error should be borne by the company and the Commission should not allow PSNH to recover these costs.

Energy and Capacity Transactions

Q. Please summarize PSNH's energy and capacity transactions in 2015.

A. Most of PSNH units have become peaking generation with output generally more expensive than the market. Consequently, the units are increasingly being placed on economic reserve for more hours than in previous years. PSNH retained load serving responsibility for customers who have not selected a competitive supplier. In 2015, PSNH provided from its own generating facilities 52% of its default Energy Service (ES) peak supply and 57% of its ES off-peak supply[1].

To meet its ES obligations in 2015, PSNH purchased 1,781,581 MWh at a cost of $52.1 million or $35.7 per MWh. In 2015, PSNH also sold 150,000 MWh at a price of $16.9 million or $113.1 per MWh. These transactions reflect the comparatively low prices for generation in New England as compared to the cost of generation units in PSNH's fleet and decreased sales volume[2].

Capacity market resources are paid for providing capacity in the Independent System Operator-New England (ISO-NE) marketplace. In 2015, PSNH owned units provided 13,173 MW-months capacity to ISO-New England, producing revenue of $41.3 million that was credited to the ES rate.

Q. Please further discuss PSNH's interaction with its energy market environment in 2015.

A. Energy purchases and sales volumes are price driven with low market prices reducing PSNH generation needs and leading to increased purchases; and conversely, high price marketplace generation leads to greater PSNH sales. In 2015, PSNH spot market purchases totaled 1,597,816 MWh at $35.4 per MWh or 82.7% of its total energy purchases as compared to 1,126,455 MWh at

[1] Frederick B. White direct testimony supporting the reconciliation of revenues and expenses, attachment FBW-2.
[2] Document request number Staff 2 – 21.

$44.3 per MWh or 67.8% of its total energy purchases in 2014. PSNH spot market sales in 2015 totaled 149,835 MWh at $113.1/MWh as compared to 310,494 MWh at $151.6/MWh in 2014[3].

During 2015, PSNH's supply resources had a capacity supply obligation of 14,192 MW-months of capacity comprised of its own generation, non-utility IPP's (including Burgess BioPower and Lempster Wind), and Hydro-Québec interconnection capacity credits. The difference between PSNH resources and the ISO-NE monthly capacity requirement, including reserve requirements, must be met through supplemental capacity purchases. PSNH owned units provided 13,173 MW-months capacity to ISO-NE in 2015[4].

In 2015, load obligation requirements due to customer migration were greater than planned during the months of January, February and December as planning assumptions did not allow for significant reverse customer migration. For example, at the beginning of January 452 MW of migrated customer loads were forecasted as compared to 379 MW of customer loads that actually did migrate. Beyond the winter months, more stable off-season energy prices resulted in a reasonably predictable customer migration.

Please refer to Exhibit WCI-3 Energy and Capacity Transactions -2015 for a more complete discussion of PSNH generation unit's relationship with the 2015 energy market, the growing influence of the market in supplying PSNH's default Energy Service, the sources of PSNH energy and capacity, the costs associated with Energy Service, energy supply and capacity, and Eversource's management of the energy procurement function.

Q. Please provide your assessment of PSNH's energy and capacity transactions filing in 2015.

[3] Ibid.
[4] Frederick B. White direct testimony supporting the reconciliation of revenues and expenses, attachment FBW-5.

A. Williams Consulting (Williams) concluded that PSNH's filing is an accurate representation of the energy and capacity purchasing and sales process that took place in 2015. Williams bases its conclusion on a review of conformance to the guidance document[5] Eversource Energy, PSNH's parent company, utilizes regarding supplemental energy and capacity purchases and sales, information learned through on-site interviews with knowledgeable personnel responsible for capacity and energy transaction function, and assessing information provided in response to our data requests.

Q. Do you have any recommendations concerning energy and capacity transaction issues in 2015?

A. No, we do not.

Outage Assessment

Q. Did you review the 2015 outages at PSNH's generating stations?

A. Yes, we reviewed outages that occurred at Merrimack Station, Newington Station, Schiller Station and the Wyman #4 unit in 2015.

Q. Have you prepared an exhibit that has an overview of PSNH 's generation outages for 2015?

A. Yes, Exhibit WCI-3 was prepared to summarize PSNH's generation outages.

Q. Based on your review and examination, what is your general opinion of PSNH outages management?

[5] Document request number Staff 1 – 06.

A. Regarding planned and forced unit outages, we found that the baseload units on the PSNH system ran well in 2015 as seen by PSNH availability on the 30 highest energy priced days. PSNH made reasonable estimates of economic reserve times and factored them into station operations and unit outages. We concluded that PSNH conducted proper planning and management oversight regarding planned and forced unit outages.

It is common utility practice to schedule major overhaul work every five or six years but recently, with less wear and tear on equipment due to reduced operating hours, PSNH has assess its major overhaul work and repair cycles so they can be lengthened or scaled back, as appropriate. PSNH uses condition-based maintenance to cost effectively determine outage scopes and budgets. Minor outages can and will be extended to accommodate work scopes when the market is expected to reflect lower energy prices[6] and there is a strong likelihood that the units will not be dispatched.

When market prices are low, PSNH schedules outages to ensure reliability to avoid replacement power costs and to prepare for the higher demand summer and winter periods. These outages are often extended to avoid overtime costs and thus reduce the overall cost of the outage. This outage approach focuses on high operational reliability during high demand periods.

Q. Did you do a more detail review of any of the 2015 outages at PSNH generating stations?

Yes, we reviewed the outages of all forced and maintenance outages greater than two days at both Newington Station and at the two units at Merrimack Station; and outages greater than four days at the three Schiller Station units and at Wyman Unit 4[7]. We reviewed outage information filed and responses to data requests, conducted on-site interviews, and submitted follow-up requests for information as necessary. A summary of these outages follows:

[6] Document request number Staff 1 – 08.
7 Docket DE 16-542 Attachment EHT-2.

PUC Outage Report No.: OR-2015-01; Station/Unit: Merrimack Station, Unit 2; Duration: 5.0 Days

Unit 2 was removed from service due to excessive water usage and to repair a significant flue gas leak at the south vertical buckstay[8]. A complete boiler inspection identified tube leaks in 2C, 2G and 2F cyclones. All cyclone leak areas were weld repaired to original wall thickness. New studs were welded on the cyclone tubes and refractory was reinstalled once all the tube leaks were repaired. A final boiler pressure test was performed, and there were no other waterside leaks found.

PUC Outage Report No.: OR-2015-02; Station/Unit: Merrimack Station, Unit 2; Duration: 23.0 Days

The primary task for this outage was to complete the final repair on the south (right sidewall) vertical buckstay. An initial repair was made to address the mechanical attachment and penthouse area during an outage on the unit that occurred from March 5 – March 11 (see OR-2015-01).

PUC Outage Report No.: OR-2015-03; Station/Unit: Merrimack Station, Unit 1; Duration: 2.4 Days

The Unit 1 planned maintenance outage involved the complete disassembly and inspection of the high pressure, intermediate pressure and low pressure (HP/IP/LP) turbine components as well as the generator. Multiple turbine blade rows were replaced during the outage and repairs were completed on other turbine blade rows. At the completion of this extensive outage work, some post-outage turbine testing and balancing was anticipated and proved to be required to reduce vibration to acceptable levels. For each balance move, the unit must be taken off-line and the rotor fully stopped to install or remove the applicable weight, then the unit restarted and taken through various load conditions to collect vibration data. This outage exceeded 48 hours, not due to a long

8 Buckstay: a beam held by stays to the exterior of a wall to keep the adjacent areas of the wall from being forced outward.

critical path, but rather due to delaying some of the final work to Monday to avoid premium costs associated with weekend work.

PUC Outage Report No.: OR-2015-04; Station/Unit: Merrimack Station, Unit 1; Duration: 7.3 Days

During post outage turbine testing and balancing efforts, a steam leak developed at the right (east) side throttle valve body flange. During disassembly of the valve and through subsequent testing, three of the valve body studs were reviewed and inspected further; and it was decided to replace all three studs. These existing, original studs were drilled out and new stud material installed.

PUC Outage Report No.: OR-2015-05; Station/Unit: Schiller Station, Unit No. 5; Duration: 6.5 Days

Unit 5 was online when a tube leak occurred. It was suspected to be in the economizer section. Unit 5 was taken offline for inspection and subsequent repairs. The inspection found one tube leak in the northeast corner in the first tube at elevation 40'. The casing was opened to access the tube. The loop was removed and replaced with a dutchman[9]. The contractor checked pipe wall thicknesses in the economizer which resulted in two more dutchmen. In-bed tubes were also inspected resulting in completing six additional pad welds and two more dutchmen were used.

PUC Outage Report No.: OR-2015-06; Station/Unit: Schiller Station, Unit 5; Duration: 4.6 Days

Unit 5 was online when high water usage indicated a tube leak. It was suspected to be in the boiler floor area in the fluidized bed section. Unit was taken offline for inspection and repairs. The inspection found two tube failures in bank #11, in tube 1 at the top and south side of the 2nd loop,

[9] Dutchman: A short lead nipple used to join two pipes that are otherwise not long enough to be joined.

this caused the failure to bank #10, tube #14 on both upper and lower loops. The damaged portions were removed and dutchmen were installed to complete repairs.

PUC Outage Report No.: OR-2015-07; Station/Unit: Merrimack Station, Unit 1; Duration: 2.2 Days

During the planned Unit 2 maintenance outage, an upgrade of the Emerson Ovation Distributed Control System (DCS) was completed. The Ovation DCS provides process and equipment control for the Merrimack Station FGD system which is common to both Units. During the hardware and software changes, a short period was required when the entire control system and therefore the FGD system was out of service. Since the scrubber is required to operate either of the Merrimack boilers, Unit 1 was declared unavailable until the work was completed.

PUC Outage Report No.: OR-2015-08; Station/Unit: Schiller Station, Unit 5; Duration: 6.6 Days

Unit 5 was taken offline due to a multi-day capacitor bank tie-in, a transmission and distribution project on Bus 2 in the station high yard which required Unit 5 to be off line. This outage provided an opportunity to inspect the unit and target preventive and corrective measures to improve reliability during the higher demand of the upcoming winter period.

Q. Based on your review and examination, did you find these outages unreasonable?

A. No, these outages are reasonable based on unit age and required operational duty cycle.

Q. How has PSNH maintenance programs changed with the reduced operating hours?

A. PSNH has transitioned its station maintenance and operations from prior base load operations to a more cyclical market environment, as well as prepare for high reliability during the peak demand

periods. With reduced capacity factors causing less wear and tear, adjustments have been made to the amount of preventative work based on hours of operation rather than specific lapsed time calendar dates. While the assessment methods for equipment and system conditions have changed as capacity factors have decreased, the goal of the preventive and predictive maintenance program, maintaining safety and high reliability at the lowest cost, has not changed. New and expanded techniques allow maintenance and operations professionals to make better informed decisions on major overhaul work, also preventive and predictive maintenance work.

PSNH's practice is using condition-based maintenance to cost effectively determine routine work, as well as outage scopes and budgets. Preventative maintenance is a key factor in ensuring the availability and reliability of utility generation assets. Preventive maintenance activities are often triggered due to manufacturer's recommendations initially, but over time those recommendations are adjusted by in-house experience and associated operations. In general, station personnel have expanded efforts to assess preventive maintenance in a variety of ways such as increased testing, analysis and inspections.

Q. Are these changes a cause for concern?

A. No, with less wear and tear due to reduced capacity factors, adjustments must be made to ensure reliability at the lowest cost. PSNH has demonstrated the willingness and the capabilities of making these adjustments in its operations and maintenance programs.

Q. Have these changes affected overall reliability?

A. No, as noted in Figure 1 below, PSNH generating units have sustained a high-level of availability during the 30 highest energy priced days.

Figure 1 - Generating Station 30 Day Availability[10]

Unit	30-Day Availability (Percent)					
	2010	2011	2012	2013	2014	2015
Merrimack 1	99.2	99.3	99.6	99.7	97.2	99.0
Merrimack 2	90.7	89.8	99.5	98.4	98.5	89.3
Newington 1	95.2	96.2	99.6	99.6	100.0	98.4
Schiller 4	97.4	99.1	96.6	97.8	99.1	99.6
Schiller 5	80.5	96.2	96.3	99.0	99.8	83.6
Schiller 6	98.6	99.9	100.0	96.0	100.0	100.0
FLEET	93.8	94.6	98.2	98.3	99.1	94.2

Q. Do you have any concerns on how PSNH has managed and operated their generation assets?

A. No, the staff at PSNH has done a good job in managing and operating the generation assets, they have shown the ability to adapt to changing business climates by being innovative in their approach to outages and maintenance programs.

Capital and Operations & Maintenance Expenditures

Q. Did you review the 2015 spending for capital projects and operations & maintenance (O&M) at PSNH generating stations?

A. Yes, Williams reviewed the 2015 capital and O&M budgets and expenditures for Merrimack Station, Newington Station, Schiller Station and the Wyman #4 unit. We also reviewed the 2015 capital and O&M budgets for the Hydro group.

Q. Have you reviewed PSNH's actual and forecasted capital and O&M spending for 2015 relative to and 2014?

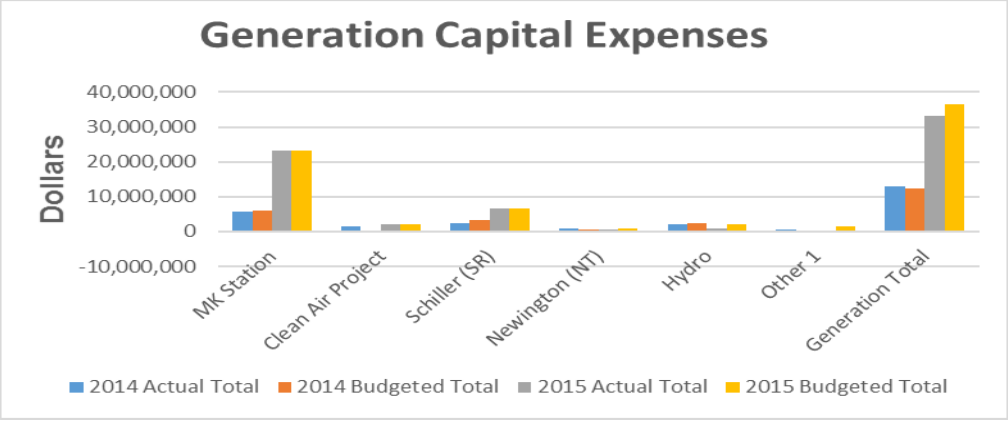
[10] Document request number Staff 2 – 14.

A. Yes, we have reviewed and developed charts of Eversource's historical and forecasted capital and O&M spending.

Q. What is the trend in PSNH's generating units' actual and forecast capital budgets?

A. Figure 2 shows PSNH generating units' capital expenditures in 2015 are approximately 150% higher when compared to 2014. The major increases were at Merrimack and Schiller stations, while Newington Station and the Hydro Fleet saw a decrease. Three projects at the Merrimack Station and another three projects at Schiller Station accounted for most of the increase. Newington and other non-coal units' capital spending decreased by 47%. Overall, PSNH generating units' capital expenditures were approximately 9% under the budgeted amount for 2015. Details of the six Merrimack Station and Schiller Station projects are contained in Exhibit WCI-5 Capital Project Review.

Figure 2- PSNH Generation Capital Expenses[11]



[11] Document request number Staff 1 – 01.

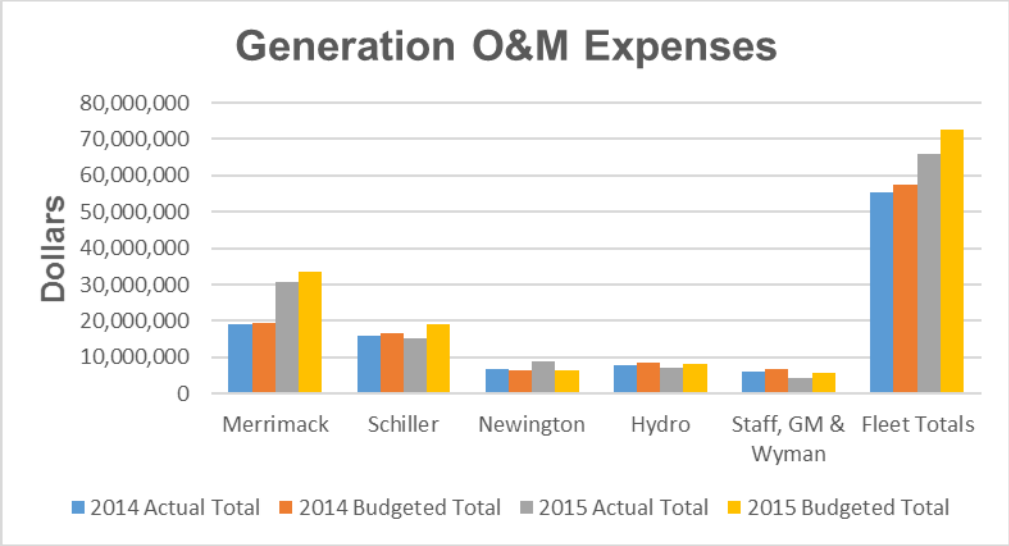
Q. Are the substantial increases in capital expenditures at Merrimack and Schiller stations cause for concern?

A. No, when we reviewed the various projects that make up most of the capital expenditures at Merrimack Station, they were accomplished to ensure reliability. Similarly, when we reviewed the various projects at the Schiller Station more than half of the expenditures were to comply with mandated state or federal regulations.

Q. What is the trend in PSNH's generating units' actual and forecast O&M budgets?

A. Figure 3 shows PSNH generating units O&M actual expenditures in 2015 were approximately 19% higher than they were in 2014. The major increases were at Merrimack and Newington stations, while Schiller Station and the Hydro Fleet saw a decrease. Shiller and other non-coal units' O&M spending decreased by 11%. Overall, PSNH generating units O&M expenditures were approximately 9% under the budgeted amount for 2015.

A. Figure 3 - PSNH Generation O&M Expense[12]



Q. Are the increases in O&M expenditures at Merrimack and Newington stations a cause for concern?

A. No. In order to ensure reliability , certain O&M expenditures must be made. Normally, O&M expenses will have peaks and valleys depending on the amount of work accomplished in different years; and that is the pattern being exhibited here.

Q. In your opinion, how has PSNH managed its budgets?

A. We have concluded in recognition of the age of their units, required operational duty cycle and good utility practice, PSNH is currently spending sufficient funds for capital replacement, improvement and maintenance projects to assure continued high performance of its generating units.

[12] Document request number Staff 1 – 01.

Dispatch Event

Q. Please briefly summarize the dispatch event that affected the PSNH's day-ahead offers in the New Hampshire Load Zone of ISO-NE.

A. In response to changes in market rules initiated by ISO-NE, PSNH implemented upgrades to the third-party software it uses to provide relevant generator information in ISO-NE's bidding software, eMarket. As a result of a data input error, on August 31, 2015 two PSNH generating units[13] did not clear the ISO-NE day-ahead energy market as they appeared to be unavailable to the market software, which resulted in ISO-NE dispatching other costlier units[14].

Q. What impact did the August 31, 2015 dispatch event have on PSNH energy costs?

A Since PSNH is typically a net purchaser in the ISO-NE market, it had to pay increased locational marginal price (LMP)[15] and congestion prices[16] to meet its load obligations that day. Based on PSNH estimates, this caused the company to pay approximately $1.2 million more than it otherwise would have for its energy purchases.

Q. Why did the two PSNH generating units appear to be unavailable to the ISO-NE market?

A. The units appeared unavailable to the market because of an inadvertent data input error that conveyed false generator energy output information to the market software. The Eversource Service Bidding and Scheduling group, while manually updating its internal bidding spreadsheet in

[13] The two generating units were coal-fired Schiller units 4 and 6.
[14] One of the costlier units dispatched was PSNH's Schiller combustion turbine, although it did not actually run real-time on August 31, 2015.
[15] Locational marginal pricing accounts for the patterns of load, generation, and the physical limits of the transmission system at different geographic locations.
[16] Congestion price are the costs that represents the inability to use the least expensive generation to meet the electricity demand due to transmission limitations. Congestion Cost is one of the three components of Locational Marginal Pricing.

December 2014 entered an incorrect Maximum Daily Energy value for each generator without a 24-hour multiplication step[17], understating the maximum energy output a given generator can produce in a day[18].

The Eversource bidding spreadsheet is used to input information into nMarket software[19], which is used to input information into ISO-NE eMarket software. At the time, this oversight had no effect on what PSNH submitted to ISO-NE, nor did it impact the market. However, the spreadsheet error as well as other certain static values[20] when inputted into nMarket failed to upload to ISO-NE's eMarket, generating a daily error message. The daily error message caused the Eversource Bidding & Scheduling group to search for a solution, but none was apparent.

Finally, in August 2015, PSNH and the software vendor, ABB, believed they had devised a solution to allow nMarket to update all relevant static fields, such as Maximum Daily Energy, in ISO-NE's eMarket software. Before implementing the fix, it was tested in the ISO-NE testing platform. This testing was completed on August 18, and the data upload worked without generating an error message. The nMarket software, which had been undergoing development, was then put into a production environment by PSNH on August 27. A Bid Input Checklist[21] was used to verify the accuracy of the data in eMarket; however, the incorrect Maximum Daily Energy values that were inputted in December 2014 remained undetected and consequently were incorrect for PSNH's generating units beginning with the August 28 day-ahead market.

[17] Maximum Daily Energy value represents the maximum energy output a given generator can produce in a day; and is determined by multiplying the Maximum Energy Output of a generator in a given hour by 24.
[18] Although Schiller 4 and 6 had MDE values equal to their one hour maximum energy output, each unit has a minimum run time in excess of one hour, so the ISO-NE's software determined they were not available to be dispatched.
[19] nMarket software was developed by a third-party outside software vendor, ABB, and licensed to PSNH. nMarket software is used to input information into ISO-NE eMarket software.
[20] Static values are ones that typically do not change daily and include such values as Economic Maximum, Economic Minimum, Minimum Run Time, Minimum Downtime, Hot and Cold Start Notification Times, Etc.
[21] The Bid Input Checklist contains step-by-step instructions for producing data, populating the data in nMarket and submitting demand bids and supply offers to ISO-NE.

Q. Since the error occurred beginning with the August 28 day-ahead market, why was the impact not realized until August 31?

A. The incorrect Maximum Daily Energy value had no effect on the ISO-NE day ahead solution until ISO-NE called for the two PSNH Schiller units to be dispatched for the August 31 day-ahead market.

Q. How was the dispatch event first discovered?

A. Employees in the Eversource Service Bidding and Scheduling group noticed that prices were high in the day-ahead market for August 31, and the two Schiller units had not been dispatched. At that point they began investigating as to the cause. As a result of a conversation initiated by the ISO-NE's Internal Market Monitor, it was determined that a measure which incorporates the Maximum Daily Energy value in eMarket, indicated to ISO-NE that the Schiller units 4 and 6 were not available for dispatch.

Q. What were the effects of the error that caused the dispatch event?

A. The error caused ISO-NE not to dispatch Schiller units 4 and 6 in the day-ahead market. PSNH, based on market data, concluded that ISO-NE's dispatch of other units caused congestion and the LMPs to rise in a limited area of ISO-NE for the August 31, 2015 day-ahead market. The data error did not affect real-time marginal congestion and LMPs. Consequently, PSNH lost the opportunity to earn market revenues from the August 31 day-ahead market and since PSNH had to purchase from the wholesale market, it paid increased energy prices.

Q. Could the error that resulted in the dispatch event been avoided?

A. Yes, there were two opportunities where the error could have been detected. First, when PSNH's spreadsheet was updated, the Maximum Daily Energy values were inputted incorrectly. Second, when nMarket was upgraded, PSNH had another opportunity to review its spreadsheet and detect the Maximum Daily Energy value error, but checking static Maximum Daily Energy values was not part of the Bid Input Checklist.

Q. With respect to the error messages received daily from December 2014 until August 2015 by the Bidding and Scheduling group, were the actions initiated by Eversource in response to the error message effective?

A. No, the repeated daily error messages stating that they could not upload MDE values into the eMarket system were never resolved and the source of the error messages was never identified.

Q. How were the costs associated with the dispatch event calculated?

A. To evaluate the financial harm caused by its error, PSNH used data available from the ISO and made several assumptions. First, the hours the units might have been dispatched were limited to the hours 11 through 22 for the August 31 day ahead market. Second, PSNH looked for a day close in time that had a similar load level and load curve that could be used as a proxy for estimating prices. It determined September 3 would be a close estimation of what would have happened on August 31. PSNH then compared revenues and costs for the hours 11 through 22 in the ISO-NE market and determined it cost approximately $1.76 million more to serve its load on August 31; and that it earned approximately $530,000 more in revenues. Thus, PSNH paid approximately $1.2 million more for energy on August 3, 2016.

Q. In your opinion, who should pay for the costs associated with the dispatch error?

A. Williams recommends that the energy purchase costs associated with the dispatch error should be borne by the company and the Commission should not allow PSNH to recover these costs.

Conclusions

Q. As a result of your review and analysis of the 2015 revenue and expense reconciliation filed by PSNH, what conclusions have you reached?

A. Due to our review and analysis of the 2015 revenue and expense reconciliation of the Default Energy Service for PSNH's fossil and hydro generating assets and the dispatch event, we have reached the following conclusions:

1. PSNH's filing is an accurate representation of the energy and capacity purchasing and sales process and transactions that took place in 2015.
2. Due to reduced capacity factors and to ensure reliability, PSNH has demonstrated the willingness and the capability of making needed adjustments to its operations and maintenance programs.
3. In recognition of the age of their units, required operational duty cycle and good utility practice, PSNH is currently spending sufficient funds for capital replacement, improvement and maintenance projects to assure continued high performance of its generating units.
4. The energy purchase costs associated with the dispatch error should be borne by the company and the Commission should not allow PSNH to recover these costs.

Q. Does this conclude your testimony?

A. Yes, it does