<u>STATE OF NEW HAMPSHIRE</u>

<u>BEFORE THE</u>

<u>PUBLIC UTILITIES COMMISSION</u>

DE 14-238

Public Service Company of New Hampshire

Determination Regarding PSNH's Generation Assets

<u>TESTIMONY</u>

<u>OF</u>

Michael D. Cannata, Jr., P. E.
Principal
INNOVATIVE ALTERNATIVES, INC.

<u>September 18, 2015</u>

Table of Contents

List of Attachments

I. INTRODUCTION AND QUALIFICATIONS

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 proceeding, I am engaged by Innovative Alternatives, Inc., whose business address is 65A Ridge Road, Deerfield, New Hampshire 03037.

Q. In what capacity are you employed?

A. I have been engaged to assist Non-Advocate Commission Staff (Staff) of the New Hampshire Public Utilities Commission (NHPUC or Commission) in the evaluation of the proposed divestiture of Eversource Energy's (Eversource or PSNH) New Hampshire generation assets as provided for in the "2015 Public Service Company of New Hampshire Restructuring and Rate Stabilization Agreement dated June 10, 2015" (Settlement Agreement).

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 the PSNH 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 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, sewer, and water industries. I also served 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 Commission's 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, and unit outage review proceedings. I have testified before the Kentucky Public Service Commission and the Maine Public Utilities Commission in transmission siting proceedings, the Maryland Public Service Commission and the Massachusetts Department of Public Utilities with respect to system reliability/storm restoration proceedings, and have submitted testimony at proceedings at the Federal Energy Regulatory Commission. I have also testified at the request of the Commission as required before Committees of the New Hampshire Legislature on a variety of matters concerning regulated utilities.

II. SUMMARY OF TESTIMONY

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

A. My testimony first addresses what I consider to be errors or mistaken assumptions in the analysis that PSNH performed to estimate the savings that will result over the initial five years from selling PSNH's generation assets at the present time (the Savings Analysis). I estimate that these errors in the Savings Analysis turn the settling parties' claim of $378.9 million in savings into a customer cost of $677.6 million over the same five years. I next address issues which would further impact the estimated savings, but which were not included in my monetary analysis. I then address technical risks that exist today and that are expected to exist in the near-term future. Finally, I discuss the option of repowering PSNH generating plants in a qualitative manner.

III. DISCUSSION OF ESTIMATED SAVINGS ADJUSTMENTS

Q. Please discus the errors or mistaken assumptions that you found and the resulting adjustments to the projected estimated nominal $378.9 million in savings.

A. There are five issues with the Savings Analysis that I describe below. The first three address errors or omissions in the data, and the remaining two address corrections due to improper comparisons between competitive Energy Service ("ES") rate and PSNH's ES rates.

A. Savings Attributed to Postponing a Rate Case for Two Years

As a result of the analysis performed by Staff witness Jay Dudley, the $77.2 million in savings that the Savings Analysis attributed to the assurance that PSNH will not file a rate case prior to July 1, 2017, should be removed. In Exhibit MDC-3A, I begin with the Savings Analysis's claim of $378.9 million in savings,[1] and deduct the $77.2 million in savings over three years that are attributed to deferring a distribution rate case. That adjustment appears as Adjustment A in Exhibit MDC-3A and reduces the estimated nominal five-year savings from $378.9 million to $301.7 million.

[1] Exhibit EHC-1, line 23.

B. Partially Missed Costs Attributed to the Requirement to Make Load Obligation Payments

The next adjustment relates to the balance of ISO-NE Capacity Payments (payments made to PSNH and other generators for owning and supplying generation to the ISO-NE market) and the ISO-NE Load Obligation Payments to ISO-NE to pay for capacity (payments made by PSNH and others those who supply the load). Currently, PSNH receives slightly more in Capacity Payments than it pays in Load Obligation Payments, resulting in a small credit to customers.[2]

If PSNH generation is sold, PSNH will still be responsible for Load Obligation Payments either when supplying Default Service to its remaining customers or through payments to a load aggregator in the competitive market. That is, the requirement to make Load Obligation Payments does not leave PSNH with the sale of its generation. The Savings Analysis assumed that Load Obligation Payments were included in the New Hampshire Default ES prices in the "April 1, 2014 Staff Report."[3] [4] Page four of the April 1, 2014, Staff Report appears as Exhibit MDC-2.

That assumption is only partially correct. The LaCapra calculation of New Hampshire Default Service prices did include Load Obligation Payments, but the values LaCapra used were based on the 2013 Forward Capacity Auction (FCA-7), whose values are lower

[2] Testimony of Fredrick B. White in Docket DE 15-132, Exhibit FBW-5.
[3] IR 13-020, Public Service Company of New Hampshire, Preliminary Status Report Addressing the Economic Interest of PSNH's Retail Customers as it Relates to the Potential Divestiture of PSNH's Generating Plants, dated April 1, 2014.
[4] Response to Data Request Staff TC 1-001.

than what has been approved at more recent Forward Capacity Auctions (FCA-8 and FCA-9).

PSNH projects that the Load Obligation Payments for 2015 and 2016 will be approximately 14,250 MW-months of load,[5] and will remain at that level into the near future. In the 2014 Staff analysis of estimated ES rates with and without the scrubber costs, Capacity Payments approximated those of Capacity Load Obligation payments and netted to approximately zero, as they do today. The results of that analysis remain valid. When the generation is sold, however, the Capacity Payments PSNH receives for its generation will be included in the sale price and will no longer be paid to PSNH, but the total Capacity Load Obligation Payments will remain with PSNH's Default ES rate.

The Savings Analysis overlooked the fact that the understated Load Obligation Payments in the New Hampshire Default Services Rate (which includes Load Obligation Payments) would leave a financial obligation to PSNH customers if the generation assets were sold. There would be no impact on the results of the 2014 Staff analysis because they are approximately equal, but the PSNH savings estimate analysis would be overstated by the difference between the outdated Load Obligation Payments used in the LaCapra analysis and those that have been recently approved. The Savings Analysis missed this point by assuming that the Capacity Payment Obligations in both the PSNH ES rates used by Staff and the low gas scenario Default Service Rate (from page 4 of the Staff April 1, 2014, Report)[6] are comparable. I have calculated what those additional Capacity Load

[5] Response to Data Request Staff 1-174.
[6] Response to Data Request Staff TC 1-001.

Obligation Payments would be using the PSNH responses to Data Requests Staff 1-174, Staff 1-179, and the LaCapra New Hampshire Default Service price calculation for values and TC 1-025, assuming Load Obligation and Capacity Payments are approximately equal.[7] My analysis also assumes a linear load approximation over the 5 and 7-month payment periods.

Table 1
Calculation of Missed Load Obligation Payments in the Analysis Presented in EHC-1

Year	**Months**	**FCA #**	**FCA Value $/kW-Month**	**$/kW for Period**	**Weighted Average $/kW-Month for Calendar Year**	**LaCapra Weighted Average $/kW-Month for Calendar Year**	**Difference Between LaCapra and Actual $/kW-Month**	**$/Year Assuming 14250 MW-Months of Load Obligation payments ($ x 10^6)**
2015	1 – 5	5	3.209	16.05	---	---	---	---
2015	7 – 12	6	3.434	24.04	3.34	---	---	---
2016	1 – 5	6	3.434	17.17	---	---	---	---
2016	7 – 12	7	3.150	22.05	3.27	---	---	---
2017	1 – 5	7	3.150	15.75	---	---	---	---
2017	7 – 12	8	7.025	49.18	5.41	5.41	0.00	0.0
2018	1 – 5	8	7.025	35.13	---	---	---	---
2018	7 – 12	9	9.551	66.86	8.50	5.68	2.82	40.2
2019	1 – 5	9	9.551	66.86	---	---	---	---
2019	7 – 12	A	9.551	66.86	9.55	5.27	4.35	62.0
2020	1 – 5	A	9.551	66.86	---	---	---	---
2020	7 – 12	A	9.551	66.86	9.55	5.79	3.76	53.6
2021	1 – 5	A	9.551	66.86	---	---	---	---
2021	7 – 12	A	9.551	66.86	9.55	6.01	3.54	50.5
Total	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**206.3**

A - Yet to be determined. Assumed in this table to remain at FCA-9 values.

Using the data quoted above, I have calculated the reductions in the claimed savings due to the higher, more recently determined, Load Obligation Payments that will remain with

[7] Response to Staff Data Request TC 1-025.

retail customers if the generation fleet is sold. This negative adjustment to the Savings Analysis appears as Adjustment B in Exhibit MDC-3A and reduces the estimated nominal five-year savings by another $206.3 million, bringing the five-year estimated nominal savings down to $95.4 million.

C. Savings Compared to Current Market Prices and Market Price Spikes.

Under the current ISO-NE dispatch mechanism, when PSNH generation is run to serve its own load, and when those operating costs are cheaper than purchasing energy from the market, PSNH customers save money. This condition has predominantly existed in the winter when gas supply is limited by congestion on the gas transmission system and when higher priority gas heating load is at its highest levels. If the Generation Assets were to be sold, customers would be obligated to pay those increased market prices. The Savings Analysis overlooked these costs.

My calculation of these savings comes from PSNH sources where it recognized these savings in other proceedings. On an annual basis, PSNH has estimated that customers saved $103.4 million in 2013 by running its own generation plants rather than buying market priced power, it saved $134.1 million in 2014, and $54.0 million in the first half of 2015.[8] For the purpose of my adjustment to the Savings Analysis, I simply averaged the savings over the 2.5 year time period, resulting in an annual $116.6 million reduction to the estimated savings. This adjustment appears as Adjustment C in Exhibit MDC-3A and reduces the estimated five-year savings by an additional $583.0 million, resulting in a nominal customer <u>cost</u> of $487.6 million over the same time period.

Exhibit MDC-4 depicts the price of gas for each year from 2011 through 2014, inclusively.[9] This exhibit clearly shows that the spikes in the price of gas have become higher during the winters of 2013/2014 and 2014/2015. The analyses presented by Mr. Chung and Mr. Frantz are based on an analysis that was completed by LaCapra Associates on March 31, 2014. The most up-to-date gas forecasts available to LaCapra in that time frame would have a vintage of late 2013 or very early 2014. Such forecasts would thus not include the high price spike events because they would rely on data prior to that time. Gas forecasts do not forecast price spikes, but predict gas demand and prices with the climate conditions that are expected to exist at peak demand conditions.[10] In addition, the LaCapra analysis utilized an average monthly gas price in its dispatch analysis.[11] This methodology does not capture the value to customers of eliminating price spikes and becomes more inaccurate as the price of gas drops to the low price levels being experienced today.

Finally, the Savings Analysis may have captured some small portion of this value through its reliance on the LaCapra report which, in turn, used average monthly gas price forecasts. Although the precise LaCapra modeling is unknown due to confidentiality issues, the use of monthly gas price forecasts will not capture most of the missed value discussed above. Nor will the Savings Analysis's comparison of PSNH's default service

[8] Response to Data Request Staff TC 1-021.
[9] Exhibit FBW-4 in the direct testimony of Mr. Fredrick B. White in Dockets DE 12-116, DE 13-108, DE 14-120, and DE 15-132 respectively.
[10] Assessment of New England's Natural Gas Pipeline Capacity to Satisfy Short and Near-Term Electric Generation Need: Phase II dated November 20, 2014, Exhibit B-1, page 115.
[11] Response to Data Request Staff TC 1-044.

rate to the competitive rate capture the value that the PSNH plants provide by protecting customers from high market prices. Such a comparison merely identifies the cost of the scrubber.

Q. What are the Errors in the Savings Analysis Due to Improper Comparisons of Data?

A. There are two and they are explained below.

D. Adjustment Required due to Using "Low Gas" Prices for the Competitive Market Price in Exhibit EHC-1 Without Similarly Adjusting the Staff Analysis.

Exhibit EHC-1 used the "low gas" Default Service Rate from page 4 of the April 1, 2014, Staff Report to calculate the estimated market price, while the analysis done by Mr. Frantz used the "reference gas price" to calculate Default Service Rates (both with and without the cost of the scrubber and assuming that generation is not sold). This inconsistency overestimates PSNH's estimated savings from divestiture.

PSNH currently serves approximately half of its approximate 8,000,000 MWh total distribution load. Of the 4,000,000 MWh of load served by PSNH, approximately 3,000,000 MWh is served from PSNH generation and PSNH buys the remaining 1,000,000 MWh from the market.[12] From Exhibit MDC-2, interpolation of the graph shows that the difference between the Low Gas Retail Rate (used by PSNH to calculate market price) and the Reference Gas Retail Rate (that Mr. Frantz used to calculate

[12] Direct Testimony of Mr. Fredrick B. White, Exhibits FBW-2 and FBW-3 in Dockets DE 14-120 and DE 15-132, respectively.

Default Service Rates) is 0.0 cents/kWh for 2015, 0.5 cents/kWh for 2016, 1.3 cents/kWh for 2017, 1.1 cents/kWh for 2018, 1.4 cents/kWh for 2019, 1.6 cents/kWh for 2020, and 1.6 cents/kWh for 2021. For the 1,000,000 MWh of served load that PSNH buys from the market, a credit must be included in the detail of the analysis performed by Mr. Frantz in order to put the 2014 Staff analysis and the current PSNH analyses on a comparative basis. Rather than credit the analysis of Mr. Frantz with this value, I chose to debit the PSNH analysis for continuity purposes -- the end result is the same in terms of impact on customer savings. My calculations are illustrated in the table below.

Table 2

Calculation of Difference Between the Low Gas Scenario and the Reference Gas Scenario New Hampshire ES Rates[1]

Description	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Total**
PSNH ES Rates Based on Reference Gas – Cents/kWh	8.2	7.5	7.5	7.9	7.9	8.8	8.9	---
PSNH ES Rates Based on Low Gas – Cents/kWh	8.2	7.0	6.2	6.8	6.5	7.2	7.3	---
Difference - Cents/kWh	0.0	0.5	1.3	1.1	1.4	1.6	1.6	---
Savings Reduction - $ x 10^6	---	---	13.0	11.0	14.0	16.0	16.0	**70.0**

1 – From page 4 of the April 1, 2014 Staff Report.

This negative adjustment to the Savings Analysis appears as Adjustment D in Exhibit MDC-3A and reduces the estimated nominal five year savings by a further $70.0 million, increasing the nominal customer cost to $557.6 million over the same time period.

E. Adjustment Required due to the Use of a Seven-Year Amortization Period for the Deferred Costs of the Scrubber.

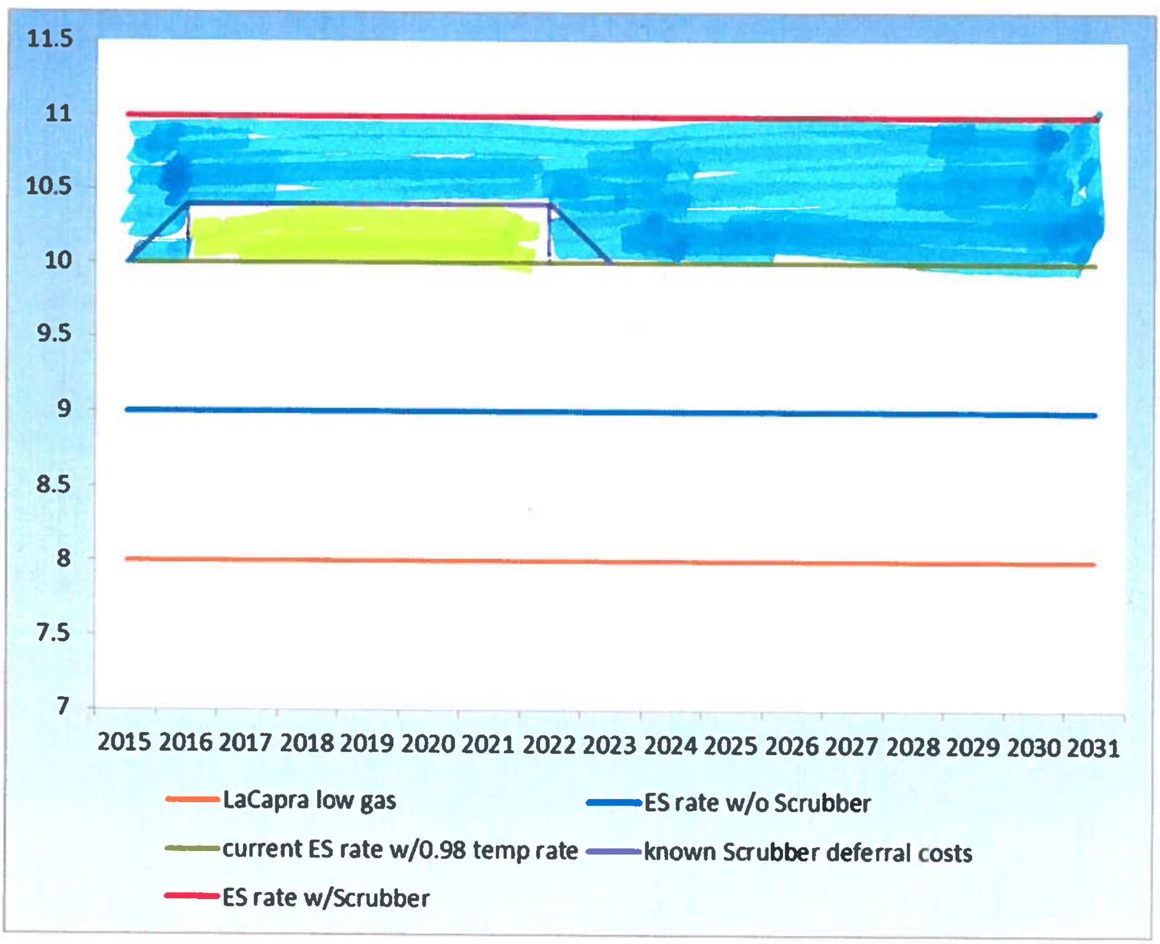
My last adjustment has to do with the timing and the amount of rate increases required to pay down the deferred costs of the scrubber. Mr. Frantz used a scrubber deferral amortization period beginning in 2015, ending in 2021, and at a value of 1.0 cents/kWh as shown in Exhibit MDC-2 (page 4 of the April 1, 2014, Staff report). Since this graph was constructed in 2014, the scrubber deferral amortization period has been determined to be seven years in length, starting on January 1, 2016, and at a rate of 0.4 cents/kWh.[13] In Exhibit EHC-1, Mr. Chung assumed that the retail rates calculated in the April 1, 2014, Staff report at year five would remain at that level for the remainder of his analysis.[14] This assumption overstates estimated savings because it is calculated for far beyond the appropriate seven year amortization period and because it uses a rate that is too high (1.0 cents/kWh rather than 0.4 cents/kWh).

To correct the ES rates used in the Savings Analysis to properly calculate the estimated savings for the actual amortization schedule of the scrubber deferral account, 1.0 cent/kWh must be subtracted from the 2015 ES rate with full scrubber costs, 0.6 cents/kWh must be subtracted from that rate for years 2016 through 2022, and 1.0 cent/kWh must be subtracted for the years 2023 to the end of the analysis. With PSNH serving approximately 4,000,000 MWh of load, and with PSNH retail rates expected to drop by 0.4 cents/kWh (or $4MWh) at the end of the seven-year amortization period, the Savings Analysis therefore over-estimated savings by approximately $40.0 million per

[13] Response to Staff Data Request Staff TC-1-015.
[14] Exhibit EHC-1, page 1, line 13 and Response to Data Request Staff TC-1-007.

year from 2023 to the end of the PSNH analysis. Because the claimed $378.9 million in estimated savings over the first five years is within the seven-year amortization period, this omission impacts that value. The adjustments to years 2015 and 2016 are moot because the sale of assets will not have occurred. In the years from 2017 through 2021, the 0.6 cents/kWh adjustment equates to a $24.0 million reduction in savings per year. These calculations are visually illustrated in Table 3 below:[15]

Table 3
Amortization of Scrubber Deferral Costs



[15] The values on the x axis of Table 3 are only representative. It is the difference between the lines on Table 3 that is the subject of my testimony.

The Savings Analysis counted all the blue shaded area between the green and red lines as savings, whereas it should have only counted the green shaded area between the green and purple lines and only for those years 2016 through 2022.[1] This corrected calculation results in a negative $120.0 million adjustment to the Savings Analysis, which appears as Adjustment E in Exhibit MDC-3A. This adjustment further reduces the estimated savings to a customer cost of $677.6 million over the initial five-year period.

Attached as Exhibit MDC-3B is a table that illustrates the effects that my adjustments will have on the ES rates to be paid by default service customers. Exhibit MDC-3B simply converts the nominal dollar adjustments I made in Exhibit MDC-3A to cents/kWh using 4,000,000 MWH of retail load served, and adds them to the market-based prices that the Savings Analysis used in its estimate. This is a similar process to the one I used in Exhibit MDC-3A. I then compared the adjusted market-based rates to the retail rates with full scrubber costs made by Mr. Frantz to show what the rate impact of Generation Asset divestiture will be for PSNH retail customers.

Q. From your analysis, what did you conclude?

A. I found that the Savings Analysis's estimated $378.9 million in savings over the first five years do not exist. My calculation shows that $1056.5 million of negative adjustments are required to Exhibit EHC-1 in the first five-year period to more closely approximate the costs customers will actually bear. After making those adjustments, divestiture of the PSNH generation fleet at this time will actually cost customers $677.6 million more than

[1] The values on the *x* axis are arbitrary. The intent of the graph is merely to illustrate the relative difference between the lines.

keeping the plants over the first five-year period, which translates to an increase in rates of 1.72 to 2.56 cents/KWh. I conclude that divestiture of the PSNH generation assets is not in the economic interest of PSNH retail customers at this time.

Q. If the sale of the generation assets does not take place at this time, will customers lose the estimated $225 million in predicted sale proceeds?

A. No, they will not. My analysis shows that customers will benefit $677.6 million over the next five years if PSNH's generation assets are not sold. Even if the plants have zero value at the end of that five year period, and thus do not realize the estimated $225 million from their sale, customers will have already benefited $452.6 million ($677.6 million in savings minus $225 not realized from the sale). I note, however, that plant valuation may actually increase in that time period due to uncertainties in the ISO New England market.

Q. Will the errors in the Savings Analysis that you highlight cause an increase in the amount that the PSNH generation assets receive at Auction? If so, how will that impact the Savings Analysis?

A. It is correct that my criticisms of the Savings Analysis may result in an auction price higher than the $225 million assumed in Mr. Chung's analysis. For different reasons, Mr. Chung analyzed the impact that an increased sale price would have on the Savings Analysis. Mr. Chung concluded that doubling the assumed $225 million sales price of the PSNH generation assets to $450 million increased customer savings by $103 million nominal dollars. Chung Testimony at 7. This hypothetical increase in savings is insufficient to overcome the customer costs described in this testimony.

IV. DISCUSSION OF ADJUSTMENTS NOT MADE TO THE SAVINGS ANALYSIS.

Q. Are there other corrections/omissions that you observed regarding the Savings Analysis?

A. Yes, there are two. I did not make numerical adjustments to the Savings Analysis for these items, but I discuss them to illustrate further weaknesses in the Savings Analysis.

First is the $25 million write-off of the Scrubber costs that is claimed as customer savings. However, this figure is the most that customers could benefit from the write-off as compared to not settling. All other scenarios would result in a savings lower than $25 million.

The amount of the write-off, absent approval of the Settlement Agreement, rests with the final decision of the Commission in Docket DE 11-250, which has not yet been made. To claim that the entire $25 million represents a "savings" requires an assumption that the Commission will order no disallowance if that case proceeds to a final order.

Any amount that the Commission would have disallowed in DE 11-250 must be deducted from the $25 million settlement write-off to calculate the "savings." For example, if the Commission were to disallow $10 million of the scrubber costs, the actual benefits to PSNH customers arising from the settlement, versus litigation, would be $15 million because the agreed-upon $25 million write-off is only $15 million greater than what, hypothetically, the Commission was going to order. On the other hand, if the Commission were to find $35 million of the scrubber project to be imprudent, then the settling parties' savings estimate of $25 million missed the opportunity to save $10 million more that the Commission would have ordered, and represents a customer cost. I recommend no adjustment to the Savings Analysis for this item, but I present the information to inform the Commission of further weakness in the Savings Analysis.

The next item is the future capacity factor projected for Merrimack Station. Merrimack Station's capacity factor is the prime driver for energy savings on the PSNH system. First, Exhibit MDC-5 (which is a copy of Attachment EHT-3, page 4, of the testimony of Ms. Elisabeth H. Tillotson in Docket DE 15-132, the reconciliation of stranded costs for 2014) shows that the capacity factors of Merrimack Station have leveled off for the last three years, which signals that the so-called "death spiral" of customer migration may not be occurring. The reason that capacity factors at Merrimack Station have leveled off is that the down-side risk on the current - very low - price of gas is minimal, and arguably cannot go much lower from an economic viewpoint because the producers and bulk transmitters of gas must pay for their exploration costs, production costs, and transmission costs, plus provide a return to their investors. Another reason the so-called "death spiral" may not be occurring is that the energy served by PSNH was 4948 GWH in 2012, 4075 GWH in 2013, and 4108 GWH in 2014 which indicates that customer migration has balanced with market conditions.[2]

Another factor that will influence the future capacity factor of Merrimack Station is the retirement of the Vermont Yankee nuclear facility in late 2014, with a capacity of approximately 600 MW, and the announced retirement of three Brayton Point coal units in 2017, with approximately 1100 MW of coal generation capacity. It is my understanding that the owners of Brayton Point have refused ISO-NE incentives to remain operational after 2017. Both of these generating stations have lower operating costs than the PSNH coal units. The net result is that when these stations are retired, a time which is concurrent to the anticipated sale of PSNH generation, Merrimack Station will be dispatched more often versus the dispatch levels of today.

Q. What are the benefits of retaining ownership of the PSNH generation as you see them?

A. The installation of the scrubber at Merrimack Station accomplished a significant reduction of air and water emissions at Merrimack Station. These reductions provide a hedge with known costs for PSNH customers to known and yet unknown environmental regulations allowing Merrimack Station to continue to operate into the future without significant environmental costs to be a concern.

[2] Exhibits FBW-2 and FBW-3 of the Direct Testimony of Fredrick B. White in Docket DE 13-108, DE 14-120, and DE 15-132, respectively.

The retention of PSNH generation provides customers with a hedge to sharp increases in delivered gas prices that have recently developed in the ISO-NE market especially during winter high gas price spike conditions. As PSNH estimated above, that volatility has been approximately $116.6 million per year in the competitive market place and the PSNH generation has protected customers against those price spikes of the market place. The market place currently does not have generation or gas transmission line solutions sufficiently in place to eliminate that risk for some years into the future.

Retention of PSNH generation provides fuel diversity for both ISO-NE and New Hampshire. In the winter, gas-fueled plants do not have secure gas supplies and are therefore not considered as firm resources in cold weather conditions. If the gas power stations in the competitive market have no fuel to operate, or if they can only get expensive fuel to operate, costs go up and ownership of diversified power plants will reduce costs to customers. This condition is well recognized by ISO-NE as it has established a second year of its Winter Reliability Program where the ISO-NE pays duel-fuel generators to have alternate fuel on hand to run during winter cold snaps, and was also recognized by the Governor of New Hampshire where she emphasized the importance of fuel diversity in her February 6, 2014, "State of the State" address to the Legislature.

Operation of Merrimack Station supports the continued operation of the rail line servicing Nashua, Manchester, and Concord. Loss of that rail line could significantly impact the businesses and jobs that depend on that rail service and could also impact the consideration of expanded passenger rail service in southern New Hampshire.

Last, the attempted sale of the PSNH units could result in a failed auction for some or all of the unit packages that may be offered for sale. As I understand the Settlement Agreement, a second auction would be held and, if that auction also fails, the units would be retired.[3] Retirements would cause the loss of hundreds of good paying jobs plus a negative impact on the local businesses that depend on work related to the operation of the units such as contractors, material suppliers, maintenance service companies, and retail firms. This event was not considered in the analysis performed by the Settling Parties.

V. TECHNICAL RISKS SELLING INTO THE MARKET THAT EXIST TODAY AND EXPECTED TO EXIST IN THE FUTURE.

Q. Will any new major generation or transmission projects come on line in the near-term to alleviate the impending capacity/demand imbalance?

A. No. The 2015 CELT Report published by ISO-NE shows that no significant generation projects, transmission projects, or demand side resources are projected to come on line after 2018. This indicates to me that capacity revenue and market prices will both likely stay high for the near-term future.

[3] The new owners could also shut down the units in a successful auction as was the case in the purchase of Brayton Point.

Q. Are there any gas transmission pipelines that are scheduled to come on-line in the near-term that could alleviate pipeline congestion and resultant price spikes in energy costs?

A. First, let me note that an analysis completed by ISO-NE titled "Assessment of New England's Natural Gas Pipeline Capacity to Satisfy Short and Near-Term Electric Generation Needs: Phase II, dated November 20, 2014, states that under the Reference Gas Demand Forecast (based on a 90/10 electric demand forecast that closely duplicates the conditions assumed for the gas market on a peak day) the region will remain gas supply constrained through 2020 despite the increase in currently contracted capacity on the interstate pipelines and the likelihood of 450MMcf/d of new capacity being added by the end of 2016.

The Northeast Gas Association in its July 24, 2015, update lists the Northeast Energy Direct Project as having its "open season held" with less than full subscription, and lists the Access Northeast project as "announced" with open season held in the first half of 2015. Both projects list projected in-service dates as 2018. I do not consider projects in this state of preliminary design and approval as committed projects for important decision making purposes.

The Governor of New Hampshire also issued a press release dated August 14, 2015, to the Federal Energy Regulatory Commission urging a rigorous review process be conducted to explore alternative routes and address local concerns for the Northeast Energy Direct Project. On August 18, 2015, the Governor issued a similar press release regarding the Northern Pass Transmission Project regarding the review to be conducted by the New Hampshire Site Evaluation Committee.

Q. What is the significance of your above statements?

A. The significance is that there are no projects on the gas or electric side of the equation that are committed to alleviate price spikes of energy in the near-term and that the review of those projects will likely take longer than currently estimated and published by the project owners. As a result, if PSNH customers are purchasing their entire energy supply from the market, they will be subjected to costs related to project delay.

Q. Do you care to comment on the importance of eliminating environmental risk moving forward as expressed by many of the Settling Parties?

A. Yes, I do. Mr. Smagula stated in his response to Staff Data Request 1-180b and at the August 20, 2015, Technical Conference that the company had solutions to address all known environmental issues and that they can be addressed within current station budget levels. Mr. Smagula further verified his statement in his response to Data Request TC-023.

VI. REPOWERING OPPORTUNITIES FOR PSNH UNITS.

Q. You mentioned at the beginning of your testimony that you would provide a qualitative analysis on the repowering of PSNH units/plants. Would you please provide that analysis at this time?

A. Certainly. The first group of units that I wish to address is the hydro units. Hydro units cannot be "repowered" in the manner I use the term[4] because they are water driven. However, PSNH has been incorporating more efficiently designed systems as various components are needed to be replaced. With regard to the stand-alone combustion turbines at remote field locations, I believe that no opportunity exists for repowering due to their age, size, and design. In addition, there is no gas infrastructure at these locations.

Newington Station already has the ability to burn gas, #6 oil, or crude oil and runs in the upper portion of the ISO-NE dispatch. Repowering would add gas-fired combustion turbines to complete the combustion cycle. While it is not expected that repowering this unit as a combined cycle unit would yield economic benefits to customers, further detailed consideration is required.

As to Schiller Station, Unit #5 has essentially been "repowered" by conversion to a biomass fluidized bed unit. Units #4 and #6 were built in approximately 1950 making these units about 65 years old. I believe that no opportunity exists for repowering these units, including the combustion turbine, due to their age, size, and design. Physical space at Schiller Station is also an issue.

Finally, Merrimack Station has higher costs due to the recent installation of the scrubber. Further costs to allow for gas firing of the boiler, the installation of gas turbines, and the gas pipeline infrastructure to provide the quantities of gas required would most likely

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[4] I use the term "Repowering" to utilize existing equipment at a generating site and not construction of a new plant at an old site.

raise costs of the station to the point where it may not be as economic in the market place. I believe that this station would not be a cost-effective candidate for repowering at this time.

VII. CONCLUSIONS

Q. Please present your conclusions.

A. Certainly. My conclusions below are presented in the same order and nomenclature as discussed in my testimony above.

A. Estimated Savings Adjustments

- It is unlikely that a rate case would be filed in the next two years to substantiate the claim that customers benefit by $77.2 million by the Settlement Agreement's two-year stay out provision. Rather, the evidence suggests that if PSNH were to file a rate case, it would result in a rate decrease.[5] The estimated savings due to the postponement of a rate case for two years is therefore fictitious[6] resulting in a reduction of estimated divestiture savings over five years of $77.2 million.
- The partial omission of higher Load Obligation Payments to ISO-NE results in the reduction of estimated savings over five years of $206.3 million.
- Failure to address customer savings when market prices exceed that of PSNH generation reduces the estimated five-year divestiture savings by $583.0 million.
- Using Low Gas Case energy prices for the calculation of market-priced ES rates and Reference Gas Case energy prices for PSNH ES rate calculations without an

[5] *See* testimony of Jay Dudley.
[6] As stated by PSNH in the Technical Conference of August 20, 2015.

adjustment result in an overstatement of estimated divestiture savings of $70 million.

- Using a 1.0 cent/KWh increase in PSNH ES rates from 2015 through 2031 to recover scrubber deferral costs results in a 15-year overestimation of divestiture savings of $504 million, with $120 million occurring in the first five years.

My conclusion is that the estimated $378.9 million in savings over the five-year period following divestiture is unsupported and that customers will actually incur a cost of $677.6 million, which will raise retail rates in the order of 1.72 to 2.56 cents/kWh during the five year period following the proposed divestiture.

B. Adjustments Not Made to the PSNH Analysis

1. PSNH Write-Off

The $25 million write-off taken by PSNH in the Settlement Agreement is the best-case savings scenario for the amount that the Commission would have disallowed if it finalized its order in Docket DE 11-250. The actual savings due to this aspect of the Settlement Agreement could not be larger than $25 million, it could be smaller than $25 million, and it could be negative.

2. Merrimack Station Capacity Factor

The capacity factor at Merrimack Station is likely to be higher than in the recent past because of unit retirements of units with lower dispatch costs in New England. Increased capacity factor should remain the case until sufficient new cost-effective generation or gas transmission lines are added in New England, none of which are currently approved.

3. Economic Impacts of the Sale of PSNH Generation

Sale of the PSNH generation fleet at this time may impede commuter rail development in Southern New Hampshire and potentially cause significant disruption the economy of southern New Hampshire. Failed auctions in the divestiture process could cause the loss of hundreds of PSNH and related jobs. None of these factors were considered in the PSNH savings analysis.

C. Technical Risks Selling into the Market That Exist Today and are Expected to Exist in the Future

1. Technical Market Risks

No large scale generation or gas transmission projects have been authorized for construction in the near future. The result is that the two man drivers of costs (price spikes and the increased cost of ISO-NE Capacity Payments) will remain in the market place in the near-term.

2. Environmental Risks

PSNH can satisfy known environmental requirements within its current budget levels.

D. Repowering Opportunities for PSNH Units/Stations

Repowering of most of PSNH units/stations does not seem appropriate. At Merrimack Station, economic repowering does not seem feasible at this time, but expenditures made to meet environmental requirements may be a plus for economic repowering in the future.

Q. Does that conclude your testimony?

A. Yes.