STATE OF VERMONT

BEFORE THE PUBLIC SERVICE BOARD

Petition of Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc., for authority to continue after March 21, 2012, operation of the Vermont Yankee Nuclear Power Station	**)**	**Docket No. 7440**

SURREBUTTAL TESTIMONY OF

PAUL CHERNICK

ON BEHALF OF

CONSERVATION LAW FOUNDATION

Resource Insight, Inc.

MAY 26, 2009

Mr. Chernick's testimony corrects errors in the computation of Vermont Yankee's proposed revenue-sharing arrangement presented in the Supplemental Surrebuttal Testimony of DPS Witness George Nagle.

TABLE OF EXHIBITS

Q: Are you the same Paul Chernick who filed direct testimony in this proceeding?

A: Yes.

Q: What is the purpose of this surrebuttal testimony?

A: In the testimony, I correct a number of errors in the computation of the value of the Vermont Yankee revenue-sharing arrangement, as presented in the supplemental surrebuttal testimony of DPS witness George Nagle.

Q: What are those errors?

A: Mr. Nagle makes the following errors in his presentation:

- His computation of the RSA strike price contains an arithmetic error that understates the RSA price (given his other estimates) and hence overstates the benefits to Vermont.
- His computation of the RSA strike price appears to use an incorrect inflator, further understating the RSA price.
- His estimates of energy prices for 2013 and 2014 are based on peak-period forwards, even though Vermont Yankee produces power around the clock and a majority of its energy would be produced during the lower-price off-peak period.
- He escalates the 2011/12 capacity market price using an escalator for industrial equipment, which is irrelevant in the existing surplus-capacity market, and ignores the realities of the forward-capacity model.

Q: What was Mr. Nagle's arithmetic error in the RSA computation?

A: In the "Exhibit DPS-GN-2 Revise RSA Update" workbook, "Misc 2009 DPS PSA" Worksheet, Mr. Nagle properly starts in 2013 with three months at the prices for the first RSA year ($61/MWh) plus nine months at the first year price escalated one year (to the second RSA-year price). For each subsequent year, he

should have increased the previous calendar year's average strike price by the escalation rate, so the 2014 strike price would be three months at the price for the second RSA year and nine months at the strike price for the third RSA year. Instead, he increased nine months of the 2013 average strike price at the escalation rate, and did not escalate the other three months. Thus, while he apparently intended to inflate the strike price at 1.16%, he actually inflated it at only 0.87%.

Q: What was the problem in Mr. Nagle's choice of inflators for the RSA strike price?

A: The RSA strike price is to be escalated using a composite inflation rate comprising the following components:

- 60% on the Employment Cost Index (ECI), specifically the ECI for total compensation for private non-farm workers in the Northeast Region including New York;
- 25% on the Gross Domestic Product Implicit Price Deflator;
- 15% on the Nuclear Fuel Market Index.

According to "Exhibit DPS-GN-2 Revise RSA Update" workbook, "Strike Price Revise" sheet, Mr. Nagle used three inflators, identified as follows:

- "Productivity & Costs: Unit Labor Costs, (Index, 1992=100, SA)"[1]
- "Implicit Price Deflator—GDP, (Index, 2000=100, SA)"

[1]Even though Mr. Nagel uses a forecast of Unit Labor Costs (perhaps from Economy.com, which he cites as a source for other escalators) to derive the 0.60% labor inflation rate, he calls this inflation rate "Employment Cost Index" in several places, including his April 24, 2009 testimony and various workpapers.

- "REVISED AEO2009 Nuclear Fuel Cost, EIA"[2]

On its face, the inflator that Mr. Nagle used for labor costs (Unit Labor Costs) is different from the inflator (Employment Cost Index) used in the RSA formula.[3] The Bureau of Labor Statistics says,

> The Employment Cost Index...is a measure of the change in the cost of labor, free from the influence of employment shifts among occupations and industries. The compensation series includes changes in wages and salaries and employer costs for employee benefits. (Bureau of Labor Statistics, Employment Cost Index technical note[4])

The BLS Handbook of Methods (pp. 4–5) clarifies that the index is computed from the "weighted average hourly wage of workers." So far as I can see in the BLS documentation, the ECI is a measure of the cost of labor, per hour or per month, without any adjustment for productivity.

In contrast, at its web site the BLS web site describes Unit Labor Costs as follows

> Unit labor costs are calculated by dividing total labor compensation by real output or—equivalently—by dividing hourly compensation by productivity. That is,
>
> unit labor costs = total labor compensation ÷ real output
>
> or equivalently,
>
> unit labor cost = hourly compensation ÷ productivity
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> (Labor Productivity and Costs, FAQ 6[5])

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[2]Another section of the same sheet gives "EIA & Econ.Com" as the source for this escalator, perhaps indicating that Mr. Nagle used the Economy.com inflation rate to restate the EIA fuel prices in nominal dollars. In his April testimony, Mr. Nagle claimed to use only Economy.com escalation data, but it appears that he used only EIA data for this escalator.

[3]It is difficult to tell exactly what Mr. Nagle did, since he does not provide specific references for much of his data (such as the source and date of a forecast or market report).

[4]Available at the BLS web site, http://www.bls.gov/news.release/eci.tn.htm, referenced 5/16/09..

[5]At http://www.bls.gov/lpc/faqs.htm#P06, referenced 5/16/09.

Roughly speaking, the annual change in Unit Labor Costs would be the change in the Employment Cost Index divided by the change in productivity.

Q: What is the practical effect of this error?

A: I do not know what level of productivity is embedded in the Economy.com forecast of Unit Labor Costs. The BLS reports productivity increasing at an average of 2.9% from 1999 to 2008, while hourly compensation (a measure similar to ECI) rose 4.2% and unit labor costs rose 1.3%. Table 1 shows Mr. Nagle's forecast of the strike price, my correction of his formula with his inflation inputs, and the effect of adding 2.9% productivity back into Mr. Nagle's unit labor cost escalator to approximate an ECI inflation forecast.

Table 1: Correction of DPS Estimate of Value of Revenue-Sharing-Arrangement Strike Price

Calendar Year	Nagle Forecast[a]	Formula Corrected	2.9% Productivity
2013	$61.53	$61.53	$62.33
2014	$62.07	$62.25	$64.14
2015	$62.61	$62.97	$66.00
2016	$63.15	$63.70	$67.91
2017	$63.70	$64.44	$69.88
2018	$64.26	$65.19	$71.91
2019	$64.82	$65.95	$74.00
2020	$65.38	$66.71	$76.14
2021	$65.95	$67.49	$78.35
2022	$66.53	$68.27	$80.63
NPV RSA (92.5%)	$339.9M	$329.3	$249.2M

[a]from Exhibit GN-2, revised

Table 1 also shows the net present value of the RSA to Vermont, using the rest of Mr. Nagle's assumptions and assuming that Vermont receives 92.5% of the

benefits. As I and others have observed, the Vermont share may be as little as 55% of the benefits.

Q: Why do you believe that Mr. Nagle used peak-period forwards rather than around-the-clock prices?

A: In the Mr. Nagel's workpaper workbook, sheet "Ques 4" identifies the energy price through 2014 (and the starting price for all subsequent years) as "NE Internal Hub Peak LMP." I cannot check whether Mr. Nagle actually used the NYMEX forwards for ISO-NE peak energy, since he does not specify his source or the date (presumably some time in April), but the NYMEX forwards are currently available out to 2014.

Q: How much lower would the market energy price be, using current on- and off-peak forward prices?

A: As I stated in my direct testimony and documented in my discovery responses, about 42.9% of hours are in the off-peak period. The following table compares the NYMEX around-the-clock average forwards as of the May 20 close to Mr. Nagle's undated forwards of peak-hour prices:

Table 2: ISO-NE Forward Energy Prices (Dollars per MWh)

Year	Peak	Off-Peak	Average	Nagle Peak
2013	$78.68	$62.17	$69.25	$75.64
2014	$80.24	$63.08	$70.44	$77.04

Source: NYMEX May 20 Close

Q: What effect would these prices have on RSA revenues to Vermont?

A: Using these energy prices for 2013 and 2014 and Mr. Nagle's estimates of energy inflation after 2014 and his capacity prices, but with the corrected strike prices discussed above, I estimate that the present value of the Vermont 92.5% share would fall to $148 million.

Q: What is the problem with Mr. Nagle's projections of capacity prices?

A: Mr. Nagel starts with the nominal price ($3.60/kW-month, or $43.20/kW-year) from the most recent forward capacity auction, FCA2, which set prices for 2011/12. He assumes that price is the price for calendar 2012, and escalates it using a projected escalator for industrial equipment. In reality,

- Load will pay $3.60/kW-month in 2011/12 for the capacity required by reliability concerns. Since more than 4,000 MW of excess resources cleared at the $3.60 floor price, the ISO prorated the price paid generation down to about $3.12/kW-month, or $37.44/kW-year.
- Given the 4,000 MW of excess in FCA 2, the addition of new generation capacity under contract in Connecticut, new renewables driven by the renewable portfolio standards in five New England states, and expanding energy-efficiency programs in Massachusetts and other states, the third forward capacity auction (for 2012/13) is essentially certain to clear at its floor price of $2.95/kW-month, with substantial excess and an effective price for generators around $2.60/kW-month, or $31.20/kW-yr.[6]
- After the third auction, current rules do not provide for any floor on the capacity prices. In the fourth auction (2013/14), more than 3,000 MW of resources would have to delist to keep the price even close to the price in the third auction. It is difficult to see how the price could be greater than $24/kW-year, and it could be much less. Some imports from New York and Canada may choose to sell into upstate New York, where the price has been running less than $24/kW-year.
- Additions of energy efficiency and renewables may cover load growth for several more years, keeping prices depressed.

[6]My estimate reflects the fact that Salem Harbor 1–4 have submitted delist bids that will result in their not clearing in the third FCA.

Rather than escalating capacity prices after 2011/12, Mr. Nagle should have reduced prices.

Q: How much effect do more realistic capacity prices have on the value of the RSA?

A: Assuming that the clearing price paid to generation is $2.60/kW-month in 2012/13, $2.00 in 2013/14–2017/18, and rises with GNP inflation thereafter, the NPV of the RSA falls to $99 million, assuming Vermont receives 92.5% of the benefit.

Q: Are there other factors that are likely to further reduce these prices?

A: Yes. As I noted in my direct testimony, the market prices for firm energy at the Mass Hub should be reduced to reflect the lower prices at the Vermont Yankee node and the lower price of unit-contingent power. Data provided by Mr. Wiggett suggests a combined decrease of about 7.5%; Mr. Nagle uses only a 4% decrease. Decreasing the energy price by the extra 3.5% would reduce the RSA NPV by near $40 million.

In addition, Entergy may not interpret the RSA to include capacity revenues, which (if arbitrators or the courts agreed) would reduce my corrected estimate by another $40 million or so.

Finally, Entergy may find it advantageous to enter into longer-term sales, even at prices below expected forward prices, due to the asymmetry in its payoff. If market prices are above the strike price and rise further, Entergy must share half the upside. But if average prices fall below the strike price, all further downside

is borne by Entergy. Hence, Entergy may well sell power for relatively long periods at prices lower than the spot markets, resulting in lower RSA revenues.[7]

Q: Does this conclude your surrebuttal?

A: Yes.

[7]As I noted in my direct testimony, Entergy may sell Vermont Yankee power at low prices under other arrangements that are in its interest, but not in the interest of Vermont energy consumers.