

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

DOCKET NO. 6300

**INVESTIGATION INTO
PROPOSED SALE OF
VERMONT YANKEE NUCLEAR POWER STATION
AND RELATED TRANSACTIONS**

DIRECT TESTIMONY AND EXHIBITS OF

**DAVID A. SCHLISSEL
SCHLISSEL TECHNICAL CONSULTING, INC.**

ON BEHALF OF THE

**VERMONT PUBLIC INTEREST RESEARCH GROUP
AND
THE NEW ENGLAND COALITION ON
NUCLEAR POLLUTION, INC.**

APRIL 14, 2000

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is David A. Schlissel. My business address is Schlissel
4 Technical Consulting, Inc., 45 Horace Road, Belmont, Massachusetts
5 02478.

6 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS**
7 **PROCEEDING?**

8 A. I am testifying on behalf of the Vermont Public Interest Research
9 Group (“VPIRG”) and the New England Coalition on Nuclear
10 Pollution, Inc. (“NECNP”).

11 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND**
12 **AND RECENT WORK EXPERIENCE.**

13 A. I graduated from the Massachusetts Institute of Technology in 1968
14 with a Bachelor of Science Degree in Engineering. In 1969, I
15 received a Master of Science Degree in Engineering from Stanford
16 University. In 1973, I received a Law Degree from Stanford
17 University. In addition, I studied nuclear engineering at the
18 Massachusetts Institute of Technology during the years 1983-1986.

19 Since 1983 I have been retained by governmental bodies,
20 publicly-owned utilities, and private organizations in 24 states to
21 prepare expert testimony and analyses on engineering and economic

1 issues related to electric utilities. My clients have included the Staff of
2 the California Public Utilities Commission, the General Staff of the
3 Arkansas Public Service Commission, the Staff of the Arizona
4 Corporation Commission, the Staff of the Kansas State Corporation
5 Commission, municipal utility systems in Massachusetts, New York,
6 Texas, and North Carolina, the Attorney General of the
7 Commonwealth of Massachusetts, and the Office of the Public
8 Advocate of the State of Maine.

9 I have testified before state regulatory commissions in Arizona,
10 New Jersey, Connecticut, Kansas, Texas, New Mexico, New York,
11 Vermont, North Carolina, South Carolina, Maine, Illinois, Indiana,
12 Ohio, Massachusetts, Missouri, and Wisconsin and before an Atomic
13 Safety & Licensing Board of the U.S. Nuclear Regulatory
14 Commission.

15 A copy of my current resume is attached as Exhibit STC-1.

16 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
17 **DOCKET?**

18 **A.** Schlissel Technical Consulting, Inc. (“STC”) was retained by VPIRG
19 and NECNP to examine three issues:

20 (1) Whether the testimony and exhibits filed by Vermont Yankee
21 Nuclear Power Corporation (“VYNPC”), Central Vermont
22

1 Public Service (“CVPS”), and Green Mountain Power
2 (“GMP”) show that continued operation of the Vermont
3 Yankee nuclear plant through 2012 would be more economic
4 than early retirement of the plant in 2001.
5

6 (2) Whether the testimony and exhibits filed by VYNPC, CVPS,
7 and GMP (“the Petitioners”) show that the proposed sale of
8 Vermont Yankee to AmerGen would be in the public interest.
9

10 (3) Whether the proposed sale of Vermont Yankee to AmerGen
11 Energy Company, LLC, (“AmerGen”) has the potential to
12 adversely affect nuclear safety.
13

14 This testimony presents the results of my investigations of these issues.

15 **Q. PLEASE EXPLAIN HOW YOU CONDUCTED YOUR**
16 **INVESTIGATION.**

17 A. I have reviewed the petitions and supporting testimony filed by
18 VYNPC, CVPS, GMP, and AmerGen and the materials provided by
19 these companies in response to discovery submitted by
20 VPIRG/NECNP and other active parties. I also have reviewed the
21 Vermont Yankee Economic Study issued in January 1999 by the
22 Department of Public Service (“DPS”) and the documents submitted
23 by the DPS at the U.S. Nuclear Regulatory Commission (“NRC”) and
24 FERC concerning the proposed sale of Vermont Yankee to AmerGen.
25 In addition, I have examined the documentation concerning other
26 nuclear power plant sales that I have received in other cases or from
27 research on the internet and Lexis-Nexis. I also have reviewed some
28 of the recent correspondence between Vermont Yankee and the NRC.

1 Finally, I was given a tour of the plant by Vermont Yankee officials
2 on March 28, 2000.

3 **II. SUMMARY OF CONCLUSIONS**

4 **Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.**

5 1. The Petitioners' analyses show that continued operation of
6 Vermont Yankee through the currently scheduled end of its
7 NRC license in 2012 can be expected to provide only marginal
8 economic benefits as compared to retiring the plant in 2001.

9 2. The assumption that Vermont Yankee would be promptly
10 dismantled at the end of its service life even if the plant were
11 retired as early as 2001 has a significant impact on the
12 economic analysis of continued operation versus early
13 retirement.

14 3. VYNPC should be required to study the cost of
15 decommissioning Vermont Yankee using the assumption that
16 the plant would be maintained in a Safe Storage mode after its
17 early retirement in 2001 and then decommissioned on the same
18 schedule as if it operated to the end of its licensed lifetime.

19 4. The following costs should be excluded from the new
20 decommissioning cost estimate to be prepared by VYNPC:

- 1 7. The testimony and exhibits filed by VYNPC and CVPS in this
2 docket show only a very marginal economic benefit to the
3 existing Vermont Yankee owners, \$51 million NPV, from the
4 proposed sale to AmerGen.
- 5 8. Even this marginal benefit is [] due to the fact that only
6 61.5 percent of the existing Vermont Yankee owners have
7 elected to buy power from AmerGen under the proposed twelve
8 year Power Purchase Agreement (“PPA”). When the fact that
9 38.5 percent of the existing owners have elected to buy-out of
10 the proposed PPA is considered in the analysis [PROTECTED
11 MATERIALS].
- 12 9. Even in the analyses presented in the testimony of VYNPC
13 witness Wiggett and CVPS witnesses Brown and Page, which
14 assume that 100% of the existing Vermont Yankee owners
15 participate in the PPA, the proposed sale to AmerGen would
16 not provide a cumulative NPV economic benefit until the year
17 2007. If the more realistic assumption that 38.5 percent of the
18 owners buy-out of the PPA is used instead, the proposed sale
19 would [PROTECTED MATERIALS].

- 1 10. It is unrealistic to assume that VYNPC or AmerGen will not
2 seek to increase Vermont Yankee's power level if a decision is
3 made to continue operating the plant to the end of its licensed
4 life in 2012.
- 5 11. The additional revenues that could be expected from shorter
6 refueling outages and the sale of the extra plant output from a
7 power uprate would significantly change the relative economics
8 of the proposed sale to AmerGen.
- 9 12. A sensitivity analysis presented by CVPS witnesses Deehan and
10 Cater shows that increasing Vermont Yankee's assumed
11 production by 10 percent changes the \$72 million NPV benefit
12 shown for the sale in their base case to a \$30 million NPV loss
13 using an eight percent discount rate, and a \$55 million NPV
14 loss using risk adjusted discount rates.
- 15 13. Actual operating experience at Vermont Yankee and other
16 BWRs shows that VYNPC should be able to achieve as much
17 additional output at Vermont Yankee as AmerGen.
- 18 14. The Vermont Yankee owners could reduce or eliminate certain
19 qualitative risks if they ended their ownership of the plant.
20 However, none of the witnesses for VYNPC, CVPS, or GMP
21 has attempted to quantify the benefits associated with

1 eliminating these risks. Nor have they examined whether these
2 same benefits could be achieved without the proposed sale.

3 15. There are a number of alternative steps besides entering into the
4 proposed sale to AmerGen that the Vermont Yankee owners
5 could take to eliminate much, if not all, of the risk of further
6 escalation in decommissioning costs.

7 16. The Vermont Yankee owners could enter into a fixed-price
8 decommissioning contract similar to those that have been made
9 at Maine Yankee, Connecticut Yankee, and Millstone Unit 1.
10 Many areas that traditionally have been exposed to significant
11 cost uncertainty appear to be included within the scope of these
12 fixed-price decommissioning contracts.

13 17. There is no need to rush into the proposed sale to AmerGen.
14 Recent developments show that there is now a much more
15 robust market for nuclear power plants than existed last fall
16 when VYNPC entered into the agreement with AmerGen.
17 Consequently, a decision at this time by the Public Service
18 Board to reject the proposed sale of Vermont Yankee to
19 AmerGen would not foreclose the possibility that a future sale
20 could be completed which would provide more significant
21 economic benefits for ratepayers.

- 1 18. Since last November, several new utilities have expressed their
2 interest in entering the market to purchase nuclear power plants.
3 One new market participant recently has made an unsuccessful
4 bid of nearly one billion dollars for two nuclear plants. It is
5 reasonable to expect that the larger pool of potential buyers who
6 now have expressed interest in participating in the nuclear
7 market will mean more competitive bidding processes and will
8 result in higher prices for nuclear power plants being sold.
- 9 19. The New York State Power Authority recently has agreed to
10 sell its two nuclear power plants to Entergy. This sale is
11 significant for the following reasons:
- 12 A. The sale involved a fiercely competitive bidding process
13 between Entergy and Dominion Resources.
14
15 B. One of the bidders, Dominion Resources, was a new
16 participant in the market.
17
18 C. A year to 18 months earlier NYPA believed that there
19 was no market for its two nuclear plants.
20
21 D. NYPA received significantly more value than any seller
22 had received in any previous nuclear sale.
23
24 E. The NPV of the \$636 million NYPA will receive for the
25 two plants and the \$171 million it will receive for the
26 nuclear fuel is \$ 319/kw or 7.4 times the \$43/kw that the
27 Vermont Yankee owners are due to receive from
28 AmerGen.
29

1 20. The Power Purchase Agreement between NYPA and Entergy is
2 for a much shorter duration than the proposed PPA for Vermont
3 Yankee and provides for lower power prices. Entergy also has
4 agreed to pay NYPA \$68 million over an eight year period, as a
5 result of NYPA’s commitment to make additional purchases of
6 power from one of the two plants. Finally, Entergy has agreed
7 to make additional payments to NYPA if over the ten year
8 period beginning with the expiration of the PPA, the prices for
9 the power from the two plants exceeds specified amounts. In
10 contrast, VYNPC’s proposed PPA with AmerGen would lock
11 the Vermont Yankee owners into paying for at least six years of
12 replacement power at higher than projected market prices.

13 21. Last June, AmerGen reached agreement with two New York
14 State utilities to buy all of Nine Mile Point Unit 1 and 59
15 percent of Nine Mile Point Unit 2. In late December, the staff
16 of the New York State Public Service Commission decided to
17 reject AmerGen’s proposed purchase because the sale did not
18 appear to maximize the value of the plants for ratepayers.
19 Within the past week, one of the two utilities involved in the
20 sale asked the Public Service Commission to terminate the

1 proposed deal and put the plants up for auction because of the
2 increasing interest from other prospective buyers.

3 22. The terms of the proposed sale of the Nine Mile Point nuclear
4 plants to AmerGen that has been rejected by the staff of the
5 New York State Public Service Commission and repudiated by
6 one of the two selling utilities were more favorable than the
7 terms of the proposed sale of Vermont Yankee to AmerGen.
8 For example, AmerGen had agreed to pay \$117/kw for Nine
9 Mile Point Unit 1 and \$136/kw for Nine Mile Point Unit 2, for
10 a total of \$163 million. This was substantially higher than the
11 \$43/kw that AmerGen has agreed to pay for Vermont Yankee.
12 The terms of the proposed Power Purchase Agreements for the
13 sale of the power from the Nine Mile Point plants also were
14 significantly more favorable than the terms in the proposed
15 Vermont Yankee PPA.

16 23. The other nuclear power plant sales that have occurred were
17 completed in a significantly less competitive market than
18 appears to exist at this time. Consequently, the prices for which
19 other utilities may have felt compelled to sell their nuclear
20 plants in that less robust market offer very little, if any, insight

1 into whether the Vermont Yankee owners should be allowed to
2 close the proposed sale to AmerGen.

3 24. The proposed sale of Vermont Yankee to AmerGen is not in the
4 public interest.

5 25. There is a significant risk that the competitive pressures in a
6 deregulated market will increase the economic and financial
7 pressures on nuclear plant owners to reduce or eliminate
8 necessary costs, cut corners, defer needed maintenance or
9 improvements, or maximize short term operating performance.

10 26. Even when power plants were subject to economic regulation,
11 there were many instances in which the pressures to cut costs or
12 maximize production led to safety-related problems.

13 27. Commonwealth Edison, Northeast Utilities and Maine Yankee
14 were three examples of strong utilities that experienced serious
15 problems after undue emphasis was placed on cutting or
16 containing nuclear plant operating costs or on maximizing near
17 term plant performance.

18 28. I agree with the following conclusions reached by the Vermont
19 State Nuclear Engineer in his February 23, 2000, Affidavit to
20 the NRC:

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- There is no guarantee that AmerGen’s owners will be liable for any more than \$110 million.
 - There is no guarantee that operating costs will provide an adequate source of funds to meet Vermont Yankee’s ongoing operational expenses for an unanticipated six-month outage.
 - There is no guarantee that any of AmerGen’s net income will be available to fund future operational shortfalls.
 - Simultaneous six-month outages at more than one of AmerGen’s plants are a reasonable possibility.
 - AmerGen is susceptible to events which could lead to simultaneous outages at more than one plant.
 - Immediate entry into decommissioning is not an alternative for insufficient funding.
 - The \$110 million pledged by AmerGen’s owners is not sufficient to pay the full costs of a six-month outage at Vermont Yankee considering scenarios which might reasonably occur.
29. There have been numerous instances where two or more of a utility’s nuclear power plants have been out of service at the same time for six months or longer due to problems that arose as a result of an emphasis on reducing costs, deficiencies in the utility’s safety culture, management problems, or generic or plant-specific technical issues.
30. The Public Service Board should take all reasonable steps to ensure that AmerGen or whatever entity may purchase Vermont

1 Yankee commits adequate resources to operate and
2 decommission the plant in a safe manner.

3
4 **III. THE PETITIONERS' ANALYSES HAVE NOT**
5 **SHOWN THAT EARLY RETIREMENT OF**
6 **VERMONT YANKEE IN THE YEAR 2001 WOULD BE**
7 **MORE EXPENSIVE THAN CONTINUED OPERATION**

8
9 **Q. DO THE ANALYSES PRESENTED BY THE PETITIONERS**
10 **SHOW A CONVINCING ECONOMIC ADVANTAGE TO**
11 **CONTINUED OPERATION OF VERMONT YANKEE**
12 **THROUGH THE END OF ITS CURRENT NRC LICENSE IN**
13 **2012 OVER RETIREMENT OF THE PLANT IN 2001?**

14 A. No. As shown on Table STC-1 below, the economic analyses
15 presented by CVPS witnesses Brown and Page, at best, show only
16 marginal benefits for continued operation of Vermont Yankee through
17 the year 2012 over the early retirement of the plant in 2001.¹

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¹ CVPS was the only petitioning party to submit an economic comparison of early retirement of Vermont Yankee in 2001 and continued operation through the end of the plant's current NRC license in 2012.

1 Table STC-1
 2 Net Present Value (“NPV”) Benefit for
 3 Continued Operation Shown in CVPS Analyses
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	10% Discount Rate	10.97% Discount Rate	13.65% Discount Rate
NPV Benefit from Continued Operation through 2012	\$63,643,000 ²	\$63,310,000 ³	\$61,537,000 ⁴

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 6
 7 These NPV benefits to continued operation represent only about 4% of
 8 the existing Vermont Yankee owners’ overall contract obligations
 9 related to the plant under either the early retirement or the continued
 10 operation scenarios.

11 **Q. DO THE PETITIONERS ACKNOWLEDGE THAT THEIR OWN**
 12 **ECONOMIC ANALYSES SHOW ONLY MARGINAL**
 13 **ADVANTAGES FOR CONTINUED OPERATION OF**
 14 **VERMONT YANKEE THROUGH THE END OF ITS CURRENT**
 15 **NRC LICENSE IN 2012?**

16 **A.** Yes. The Petitioners acknowledge that their base case analyses show
 17 only marginal benefits for continued operation of Vermont Yankee
 18 through 2012 over scenarios which assume that the plant would be
 19

² Line 465 of Exhibit ___ SWP-1, page 6 of 6.

³ Line 465 of Exhibit ___ SWP-2, page 6 of 6.

1 retired early. [PROTECTED MATERIALS]

2
3 [PROTECTED MATERIALS⁵]
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7 Although Mr. Page was referring to a slightly earlier set of economic
8 studies, those analyses produced the same levels of marginal benefits
9 as the studies he has sponsored in this proceeding.

10 **Q. WHY IS EARLY RETIREMENT THE MORE EXPENSIVE**
11 **OPTION IN CVPS'S ECONOMIC ANALYSES IN THIS**
12 **PROCEEDING?**

13 **A.** As shown on Table STC-2 below, the marginally higher cost of
14 retiring Vermont Yankee in 2001 in CVPS's analyses is due to the
15 significantly higher decommissioning expenditures in that scenario.

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⁴ Line 465 of Exhibit ____SWP-3, page 6 of 6.

⁵ Protected Materials

Table STC-2
 Contribution of Higher Decommissioning
 Expenditures to the Benefit for
 Continued Operation Shown in CVPS Analyses

	10 % Discount Rate	10.97 % Discount Rate	13.65 % Discount Rate
NPV Benefit from Continued Operation through 2012	\$63,643,000	\$63,310,000	\$61,537,000
NPV of Incremental Decommissioning Costs in Early Retirement Scenario	\$97,025,000 ⁶	\$92,646,000 ⁷	\$82,512,000 ⁸

In other words, early retirement would be the lower cost alternative in this analysis but for the higher decommissioning costs.

Q. WHY ARE THE DECOMMISSIONING COSTS HIGHER IN CVPS'S EARLY RETIREMENT SCENARIOS THAN IN THE SCENARIOS IN WHICH VERMONT YANKEE CONTINUES OPERATION THROUGH THE YEAR 2012?

A. The decommissioning costs are higher in the early retirement scenarios because CVPS assumes that Vermont Yankee would be promptly dismantled at the end of its service life, even if the plant were retired early in 2001.

⁶ Line 444 of Exhibit ___ SWP-1, page 6 of 6.

⁷ Line 444 of Exhibit ___ SWP-2, page 6 of 6.

⁸ Line 444 of Exhibit ___ SWP-3, page 6 of 6.

1 As was clearly explained by the DPS staff in its January 1999 Vermont
2 Yankee Economic Study, the assumption that the plant would be
3 promptly dismantled after being retired early increases the share of
4 decommissioning costs that would have to be paid by ratepayers:

5
6 The study found that the greatest contributor to the
7 extra expenses related to shutdown was the financial
8 impact of using the decommissioning fund early.
9 Vermont Yankee has just over \$200 million in its
10 decommissioning fund. This money is invested, and a
11 significant part of future decommissioning expenses at
12 End of License (“EOL”) would come from returns on
13 this investment. However, if the plant were to close
14 prematurely, the existing fund would be used promptly,
15 and ratepayers would have to pay the amounts now
16 expected to come from investment returns.⁹
17

18 The DPS staff further explained that the penalty resulting from this
19 early use of the decommissioning fund could be reduced by holding
20 the plant in a safe-storage condition following early shutdown until the
21 fund earns enough to proceed with decommissioning:

22
23 For early shutdown cases, delaying use of the
24 decommissioning fund by placing the plant in a safe
25 storage condition would be beneficial to ratepayers.
26 This allows the fund to build up through returns on
27 investments and reduces the decommissioning portion of
28 early shutdown (the early-use-of-the-fund effect).¹⁰
29

⁹ January 1999 DPS Vermont Yankee Economic Study, at page 3.

¹⁰ January 1999 DPS Vermont Yankee Economic Study, at page 40.

1 **Q. IS THERE ANY REQUIREMENT THAT VERMONT YANKEE**
2 **BE PROMPTLY DISMANTLED IF THE PLANT WERE**
3 **RETIRED BEFORE ITS CURRENTLY SCHEDULED END OF**
4 **LIFE IN 2012?**

5 A. No. There is no requirement from the NRC or any other government
6 agency or industry group that would necessitate the immediate
7 decommissioning of Vermont Yankee if it were retired in the year
8 2001.

9 In fact, there are several accepted options, designated as SAFSTOR
10 and ENTOMBMENT, in which decommissioning of a nuclear power
11 plant is delayed for years after the plant completes commercial
12 operation. Under the SAFSTOR option, the facility is placed and
13 maintained in a condition that allows it to be safely stored and
14 subsequently decommissioned. Under the ENTOMBMENT option, the
15 radioactive contaminants are encased in a structurally long-lived
16 material such as concrete; the entombed structure is appropriately
17 maintained and continued surveillance is carried out until the
18 radioactive material decays to a level permitting unrestricted use of the
19 property. The delay in decommissioning inherent in the
20 ENTOMBMENT option is substantially longer than in the SAFSTOR
21 option.

1 **Q. ARE YOU AWARE OF ANY UTILITIES THAT HAVE**
2 **DECIDED TO DELAY THE DISMANTLING OF**
3 **PREMATURELY RETIRED NUCLEAR POWER PLANTS?**

4 A. Yes. Commonwealth Edison Company (“ComEd”) retired both units
5 of the Zion Nuclear Station in January, 1998, approximately 15 years
6 prior to their previously scheduled end of service life. However, the
7 Company subsequently decided to delay the dismantling of most of
8 these two units until the originally expected end of operations in 2013
9 rather than immediately dismantling the entire facility. Under the
10 current plan, ComEd initially will dismantle a number of plant systems
11 and structures and then maintain the plant in a dormant state from
12 2000 through 2013. ComEd has given the following explanation for
13 its decision to pursue this delayed decommissioning strategy:

14
15 ComEd has chosen a modified version of DECON,
16 referred to as Delayed-DECON, which decommissions
17 the site in a timely manner, but recognizes constraints
18 associated with storage of the spent fuel and
19 decommissioning funding availability for the site.
20 Decommissioning field activities are forecast to begin
21 on the same schedule as if the plant operated to the end
22 of its licensed lifetime. This permits the
23 decommissioning trusts to be fully funded prior to field

1 activities, plus it allows the spent fuel situation in the
2 U.S. to coalesce and a definite plan of action to begin.¹¹
3

4 VYNPC similarly could decide to maintain Vermont Yankee in an
5 extended safe storage mode and delay the start of decommissioning
6 and dismantling until after the previously scheduled termination of
7 operations in the year 2012.

8 **Q. DID THE DPS STAFF RECOMMEND THAT VYNPC STUDY**
9 **THE ECONOMICS OF PLACING VERMONT YANKEE INTO**
10 **EXTENDED SAFE STORAGE IF THE PLANT WERE RETIRED**
11 **EARLY?**

12 **A.** Yes. The DPS staff's January 1999 Vermont Yankee Economic Study
13 specifically recommended that VNPC should:

14 investigate and provide information regarding potential
15 savings associated with extended safe-storage instead of
16 prompt decommissioning. This investigation should also
17 include the alternative of longer-term storage
18 (entombment) which is currently under review by
19 NRC.¹²
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23 The DPS further recommended that VYNPC should adjust the
24 assumptions for its decommissioning estimate so that the federal

¹¹ February 1999 Decommissioning Cost Estimate for the Zion Nuclear Power Station Units 1 and 2, prepared for Commonwealth Edison Company by TLG Services, Inc., at Section 3, page 1 of 9.

1 government, and not ratepayers, is responsible for the costs of long-
2 term storage of spent nuclear fuel.¹³

3 **Q. HAVE VYNPC OR EITHER OF THE VERMONT OWNERS**
4 **SUBSEQUENTLY ANALYZED WHAT THE COST OF**
5 **DECOMMISSIONING VERMONT YANKEE WOULD BE IF**
6 **THE PLANT WERE RETIRED IN 2001 AND THEN**
7 **MAINTAINED IN EXTENDED SAFE-STORAGE?**

8 A. No.¹⁴ The 1994 Vermont Yankee decommissioning cost analysis did
9 consider a SAFSTOR option in which the plant was placed in an
10 extended safety-storage mode upon the completion of its planned 40
11 year service life. However, the 1999 Vermont Yankee
12 decommissioning cost estimate only considered prompt dismantling.¹⁵
13 Consequently, VYNPC only assumes prompt dismantlement in all
14 decommissioning scenarios.¹⁶

15 **Q. IF VERMONT YANKEE WERE PLACED IN AN EXTENDED**
16 **SAFE STORAGE MODE AFTER BEING RETIRED IN 2001,**
17 **WHAT COSTS WOULD VYNPC INCUR IN THE**

¹² January 1999 DPS Vermont Yankee Economic Study, at page 55.

¹³ January 1999 DPS Vermont Yankee Economic Study, at page 55.

¹⁴ VYNPC's response to VPIRG/NECNP Data Request 1-64.

¹⁵ VYNPC's response to DPS Informal Data Request 1-16.

¹⁶ VYNPC's response to VPIRG/NECNP Data Request 1-62.

1 **INTERVENING YEARS BETWEEN EARLY RETIREMENT**
2 **AND THE START OF DECOMMISSIONING ACTIVITIES?**

3 A. Based on its 1994 decommissioning cost analysis, VYNPC has
4 estimated that preparations for entering into an extended safe storage
5 mode would cost approximately \$40.6 million in 1999 dollars.
6 Maintaining the plant in such a mode for a twelve year SAFSTOR
7 period would cost another \$59.4 million in 1999 dollars.¹⁷

8 **Q. DOES CVPS INCLUDE ANY INAPPROPRIATE COSTS IN ITS**
9 **ESTIMATE OF THE IMPACT OF DECOMMISSIONING**
10 **VERMONT YANKEE UPON THE PLANT’S RETIREMENT IN**
11 **2001?**

12 A. Yes. The following costs need to be removed from VYNPC’s 1999
13 decommissioning cost analysis:

- 14
- 15 1. The \$56 million or more of costs related to the expansion and
16 operation of the dry cask storage facility.
17
- 18 2. All spent fuel storage costs incurred as a result of the Federal
19 Department of Energy’s failure to begin accepting spent fuel in
20 January 1998, as mandated by the Nuclear Waste Policy Act of
21 1982.
22
- 23 3. At least \$33.85 million in site restoration costs included in the
24 1999 estimate.
25

¹⁷ VYNPC’s response to DPS Informal Data Request 1-16.

1 In addition, the new Vermont Yankee analysis should reflect the
2 potential savings that could be obtained by retaining Entergy or
3 another qualified contractor to manage decommissioning activities.

4 **Q. WOULD A DRY CASK STORAGE FACILITY HAVE TO BE**
5 **BUILT AT VERMONT YANKEE IF THE PLANT WERE**
6 **RETIRED IN 2001?**

7 A. No. There would be sufficient wet storage capacity in the plant's
8 spent fuel pool. However, a dry cask storage facility would be
9 required if the plant continued operating through 2012 in order to
10 enable the plant to maintain a full core offload capacity. Therefore, all
11 costs related to the construction and operation of the Interim Spent
12 Fuel Storage Installation ("ISFSI") should be removed from the
13 estimate of what it would cost to decommission Vermont Yankee if the
14 plant were retired in 2001.

15 **Q. WHY DO YOU SAY THAT AT LEAST \$33.85 MILLION IN**
16 **SITE RESTORATION COSTS SHOULD BE REMOVED FROM**
17 **THE 1999 DECOMMISSIONING COST ESTIMATE WHEN**
18 **ANALYZING WHETHER EARLY RETIREMENT OR**
19 **CONTINUED OPERATION IS THE MORE ECONOMIC**
20 **OPTION?**

1 A. Vermont Yankee's 1999 decommissioning cost estimate includes
2 \$33.85 million for site restoration costs. This figure is substantially
3 lower than the site restoration costs included in Vermont Yankee's
4 1994 and 1997 decommissioning cost estimates. For example, the
5 1994 estimate, which was prepared by TLG, Inc., the same consultant
6 who prepared the 1999 estimate, included site restoration costs of
7 \$44.117 million in 1993 dollars. This translates into approximately
8 \$54 million in 1999 dollars.

9 Similarly, Vermont Yankee's 1997 decommissioning cost estimate
10 included \$68.765 million in 1997 dollars for site restoration costs.
11 This translates into \$73.66 million in 1999 dollars. Clearly, the 1994
12 and 1997 estimates both included significantly higher site restoration
13 costs than are in the 1999 estimate. VYNPC should be required to
14 explain this discrepancy as part of the revised decommissioning cost
15 analysis that I believe the Board should require the Company to
16 prepare.

17 **Q. DID THE DPS INCLUDE THESE SITE RESTORATION COSTS**
18 **IN ITS JANUARY 1999 VERMONT YANKEE ECONOMIC**
19 **STUDY?**

1 A. The DPS excluded these site restoration costs in their base case
2 analysis. However, they also included a sensitivity case to show the
3 effects of including these costs.¹⁸

4 **Q. WHAT IS THE BASIS FOR YOUR STATEMENT THAT VYNPC**
5 **SHOULD EVALUATE THE POTENTIAL SAVINGS**
6 **AVAILABLE FROM RETAINING ENTERGY OR ANOTHER**
7 **QUALIFIED CONTRACTOR TO MANAGE THE**
8 **DECOMMISSIONING OF VERMONT YANKEE?**

9 A.
10 [PROTECTED MATERIALS¹⁹]

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15
16 Unfortunately, neither GMP, CVPS nor VYNPC has provided a copy
17 of the [PROTECTED MATERIALS]. Nevertheless, the potential
18 savings from [PROTECTED MATERIALS] should be

¹⁸ January 1999 DPS Vermont Yankee Economic Study, at page 37.
¹⁹ Protected Materials

1 explored and factored into the economic analyses of early retirement
2 versus continued operations.

3 **Q. ARE THERE ANY OTHER INPUT ASSUMPTIONS IN CVPS'S**
4 **ANALYSIS OF THE ECONOMICS OF EARLY RETIREMENT**
5 **THAT SHOULD BE RE-EVALUATED?**

6 A. Yes. The economic costs and benefits of both the continued operation
7 and the early retirement scenarios need to be examined over a range of
8 possible capacity factors and O&M and capital expenditures. For
9 example, the possible adverse impacts of plant aging on operating
10 performance and operating costs should be explored.

11 At the same time, as I will explain in the next section of this
12 testimony, it is realistic to expect that if Vermont Yankee is not retired
13 in the near future whatever entity owns the plant will seek to uprate
14 the power level. The additional output resulting from such a power
15 uprate also should be considered.

16 Finally, the assumed market prices for the replacement power that
17 would be needed if Vermont Yankee were to be retired in 2001 also
18 have a significant impact on the relative economics of early retirement.
19 For example, using the market price forecasts for replacement power
20 prepared by the REED Consulting Group in 1998 and a 10% discount
21 rate, CVPS witness Page has estimated that continued operation of

1 Vermont Yankee through 2012 would produce a \$64 million NPV
2 versus early retirement in 2001. [PROTECTED MATERIALS]

3
4 [PROTECTED MATERIALS²⁰]

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12 **Q. ARE MARKET PRICE FORECASTS FOR FUTURE POWER**
13 **PRICES VERY VOLATILE?**

14 **A.** Yes. Replacement power market price forecasts are very volatile.
15 For example, the State of Vermont Nuclear Engineer, William K.
16 Sherman, noted in his February 23, 2000, Affidavit to the NRC that
17 Vermont Yankee market price forecasts had changed by negative 4%
18 to negative 7% over the period 1997 to 1999.²¹ Mr. Sherman also

²⁰ Protected Materials

²¹ Affidavit of William K. Sherman, dated February 23, 2000, at page 3, and Exhibit WKS-4.

1 cited the following NRC Staff conclusion regarding the difficulty of
2 relying on market price forecasts:

3
4 After reviewing several forecasts of U.S. electricity
5 prices and other relevant information (such as a forecast
6 of regional capacity margins), the staff concludes that
7 attempting to forecast the growth rate, or even the
8 direction of growth, for market-based prices in [Clinton
9 Power Station's] market area is too speculative to be
10 useful for its contingency analysis.²²
11

12 **Q. ON WHICH MARKET PRICE FORECAST SHOULD THE**
13 **PUBLIC SERVICE BOARD RELY WHEN EVALUATING**
14 **WHETHER EARLY RETIREMENT OR CONTINUED**
15 **OPERATION IS THE MORE ECONOMIC OPTION?**

16 **A.** Rather than rely on any speculative market price forecast(s), I believe
17 the Public Service Board should require CVPS and GMP to issue
18 requests for bids to provide replacement power assuming that Vermont
19 Yankee were retired in 2001. In this way, the Board would know what
20 suppliers actually would charge for that replacement power instead of
21 being forced to rely on ever changing forecasts.

²² Affidavit of William K. Sherman, dated February 23, 2000, at page
3

1 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE**
2 **CONTINUED OPERATIONS STUDIES PRESENTED BY CVPS**
3 **WITNESSES BROWN AND PAGE?**

4 A. My conclusions regarding the early retirement versus continued
5 operations economic analyses presented in this proceeding by CVPS
6 witnesses Brown and Page are as follows:

- 7 1. The Petitioners' analyses show that continued operation of
8 Vermont Yankee through the year 2012 can be expected to
9 provide only marginal economic benefits as compared to
10 retiring the plant in 2001.
- 11 2. The assumption that Vermont Yankee would be promptly
12 dismantled at the end of its service life even if the plant were
13 retired as early as 2001 has a significant impact on the
14 economic analysis of continued operation versus early
15 retirement.
- 16 3. VYNPC should be required to study the cost of
17 decommissioning Vermont Yankee using the assumption that
18 the plant would be maintained in a Safe Storage mode after its
19 early retirement in 2001 and then decommissioned on the same
20 schedule as if it operated to the end of its licensed lifetime.

- 1 4. The following costs should be excluded from the new
2 decommissioning cost estimate to be prepared by VYNPC:
- 3 • the costs related to the construction and operation of an
4 ISFSI.
 - 5
6 • all spent fuel storage costs incurred as a result of the
7 U.S. DOE's failure to begin accepting spent fuel in
8 January 1998.
 - 9
10 • site restoration costs.
- 11 5. The market prices for replacement power assumed in the early
12 retirement scenario have a significant impact on the economic
13 analysis of continued operation versus early retirement.
14 Because market price forecasts are highly volatile, the Public
15 Service Board should require CVPS and GMP to issue requests
16 for bids to provide replacement power assuming that Vermont
17 Yankee were retired in 2001. This would allow the Board to
18 know what suppliers actually would charge for replacement
19 power rather than being forced to rely on ever changing
20 forecasts.
- 21 6. New analyses of the economics of retiring Vermont Yankee in
22 2001 versus at the end of its licensed lifetime in 2012 should be
23 performed when VYNPC has prepared the new

1 decommissioning cost estimate and CVPS and GMP have
2 received the bids for replacement power.

3
4

5 **IV. THE PROPOSED SALE OF VERMONT YANKEE TO**
6 **AMERGEN IS NOT IN THE PUBLIC INTEREST**

7

8 **Q. WHAT PAYMENTS WILL VERMONT YANKEE’S OWNERS**
9 **RECEIVE UNDER THE PROPOSED SALE TO AMERGEN?**

10 A. The Asset Purchase Agreement (“APA”) establishes that AmerGen
11 will pay a price of \$10 million, net of several adjustments specified in
12 the APA, if the sale is closed on December 1, 2000, plus \$90,000 for
13 each day prior to December 1, 2000, that the closing occurs. This
14 means that that Vermont Yankee’s owners would receive \$23.5
15 million, net of adjustments, if the sale were to be closed on July 1,
16 2000. However, VYNPC also expects that the purchase price will be
17 reduced by \$1.5 million, whenever closing occurs, as an adjustment
18 for technical work that will not be completed by the closing date.²³

19 **Q. WOULD THIS PAYMENT FULLY COMPENSATE THE**
20 **OWNERS AND THEIR RATEPAYERS FOR THE VALUE OF**
21 **VYNPC AS OF THE CLOSING DATE?**

²³ VYNPC’s response to DPS Formal Data Request 1F-21.

1 A. No. A \$22 million payment if closing were completed on July 1,
2 2000, would not even compensate VYNPC for the \$35.7 million value
3 of the fuel on hand and fuel related contracts, let alone the \$139
4 million net value of the plant.²⁴ In fact, when you consider the other
5 payments that VYNPC has to make to AmerGen as part of the
6 proposed sale, the owners really are paying AmerGen to take the plant
7 and associated assets.

8 **Q. DO THE ANALYSES PRESENTED BY THE PETITIONERS**
9 **SHOW SIGNIFICANT NPV BENEFITS FROM THE PROPOSED**
10 **SALE OF VERMONT YANKEE TO AMERGEN?**

11 A. No. The base case analyses presented by the witnesses for VYNPC
12 and CVPS show marginal NPV benefits of only \$51 million to \$75
13 million from the proposed sale to AmerGen. These benefits are only
14 3.5 to 4 percent of the total contract obligation associated with
15 Vermont Yankee over the period 2000 through 2012.

16 Moreover, all of these analyses [] the benefits associated with the
17 proposed sale to AmerGen because they assume that 100 percent of the
18 Vermont Yankee owners elect to buy power under the twelve year
19 Power Purchase Agreement (“PPA”). In reality, 38.5 percent of the

²⁴ VYNPC’s response to CLF Data Request 2-1.

1 owners have elected the PPA buy-out option and will not participate in
2 the 12 year PPA.

3 **Q. WHAT IMPACT DOES THE FACT THAT 38.5 PERCENT OF**
4 **THE VERMONT YANKEE OWNERS HAVE ELECTED TO**
5 **BUY-OUT OF THE 12 YEAR PPA HAVE ON THE RELATIVE**
6 **ECONOMICS OF THE PROPOSED SALE TO AMERGEN?**

7 A. VYNPC witness Wiggett has revised his economic analysis to reflect
8 the fact that 38.5 percent of the owners have decided to buy-out of the
9 PPA rather than purchasing power from Vermont Yankee.
10 [PROTECTED MATERIALS²⁵]

11 It is reasonable to expect that the analyses presented by CVPS
12 witnesses Brown/Page and Cater/Deehan would change in a similar
13 manner if they were adjusted to reflect the fact that only 61.5 percent
14 of the owners will participate in the 12 year PPA.

15 **Q. WOULD THE PROPOSED SALE PROVIDE AN IMMEDIATE**
16 **ECONOMIC BENEFIT TO RATEPAYERS?**

17 A. No. Even in the analyses presented in the testimony of VYNPC
18 witness Wiggett and CVPS witnesses Brown and Page, which assume
19 that 100 percent of the owners participate in the PPA, the proposed
20

1 sale would not provide a cumulative NPV economic benefit until the
2 year 2007. If the more realistic assumption that only 61.5 percent of
3 the owners participate in the PPA is used instead, the proposed sale
4 would [PROTECTED MATERIALS]

5 **Q. ARE THERE ANY OTHER FLAWED ASSUMPTIONS THAT**
6 **RESULT IN THE ANALYSES PRESENTED BY VYNPC, CVPS**
7 **AND GMP OVERSTATING THE ECONOMIC BENEFITS**
8 **THAT CAN BE EXPECTED FROM THE PROPOSED SALE OF**
9 **VERMONT YANKEE TO AMERGEN?**

10 A. Yes. The analyses presented by VYNPC and CVPS in support of
11 their petition assume that Vermont Yankee's future refueling outages
12 would be 52 days in length.²⁶ However, VYNPC's internal documents
13 reveal that Vermont Yankee budgets in recent years have projected
14 that plant refueling outages would be [] days in duration.²⁷ At the
15 same time, AmerGen expects to be able to achieve refueling outages as
16 short as 35 days in length.

17 In addition, the analyses presented by VYNPC and CVPS mostly
18 ignore the fact that unless the plant is retired in the near future,
19 whatever entity owns Vermont Yankee will seek to uprate the power

²⁵ Protected Materials

²⁶ VYNPC's response to CAN Data Request 2-16, at page 2.

1 level. However, the additional revenues that could be expected from
2 shorter refueling outages and the sale of the extra plant output made
3 available as a result of a power uprate would significantly change the
4 relative economics of the proposed sale to AmerGen.

5 **Q. WHAT IMPACT WOULD ASSUMING SHORTER REFUELING**
6 **OUTAGES HAVE ON THE RELATIVE ECONOMICS OF THE**
7 **PROPOSED SALE?**

8 A. The analyses prepared by VYNPC and CVPS show that the benefits
9 from the proposed sale decrease if it is assumed that the output of
10 Vermont Yankee increases above forecast levels. In other words, the
11 higher the output from Vermont Yankee, the lower the claimed
12 benefits from the proposed sale. Consequently, assuming that future
13 Vermont Yankee refueling outages would last [] days, as in the
14 Company's budget documents, rather than 52 days would mean a
15 minor decrease in level of the economic benefits from the sale claimed
16 by the VYNPC and CVPS witnesses.

17 **Q. PLEASE EXPLAIN WHAT IS INVOLVED IN A POWER**
18 **UPRATE FOR A BOILING WATER REACTOR NUCLEAR**
19 **POWER PLANT LIKE VERMONT YANKEE.**

1 A. Boiling water reactor (“BWR”) nuclear power plants like Vermont
2 Yankee were originally licensed by the NRC for power levels
3 approximately 20 percent below their physical capacity. Since the late
4 1980’s, the NRC has permitted utilities to uprate the licensed power
5 levels at their BWRs after the utilities have conducted very detailed
6 analyses that show that acceptable safety margins exist at the higher
7 power levels. No significant equipment changes or modifications have
8 generally been required to achieve these power uprates.

9 **Q. WHAT IS THE BENEFIT OF SUCH A POWER UPRATE?**

10 A. A power uprate allows a utility to increase the output of its plant at
11 very low cost.

12 **Q. HAVE OTHER THE POWER LEVELS BEEN INCREASED AT**
13 **OTHER BWRS?**

14 A. Yes. [PROTECTED MATERIALS²⁸]

15

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18

19 **Q. HAS VYNPC STUDIED WHETHER A POWER UPRATE**
20 **WOULD BE FEASIBLE AT VERMONT YANKEE?**

1 A. Yes. [PROTECTED MATERIALS²⁹]

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8 [PROTECTED MATERIALS³⁰]

9

10 **Q. WHY HASN'T A POWER UPRATE BEEN PERFORMED AT**
11 **VERMONT YANKEE?**

12 A. [PROTECTED MATERIALS³¹]

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²⁸ Protected Materials

²⁹ Protected Materials

³⁰ Protected Materials

³¹ Protected Materials

1 [PROTECTED MATERIALS]

2

3 **Q. IS IT REALISTIC TO ASSUME THAT VYNPC OR AMERGEN**
4 **WILL NOT SEEK A POWER UPRATE IF A DECISION IS**
5 **MADE TO CONTINUE OPERATING VERMONT YANKEE TO**
6 **THE END OF ITS LICENSED LIFE IN 2012?**

7 A. No.

8 **Q. WHAT IMPACT WOULD THE ASSUMPTION THAT THE**
9 **CURRENT VERMONT YANKEE OWNERS OR AMERGEN**
10 **WILL SEEK A POWER UPRATE HAVE ON THE RELATIVE**
11 **ECONOMICS OF THE PROPOSED SALE TO AMERGEN?**

12 A. If the proposed sale is completed, then AmerGen will be able to sell
13 any additional power made available as a result of a power uprate and
14 pocket the profits. As explained by CVPS witness Stephen Page in a
15 November 10, 1999, CVPS Power Supply Department Memorandum,
16 if VYNPC maintained ownership, the increased megawatt hours from
17 a successful uprate would be saleable at market prices if not needed to
18 serve the owners' native loads. As a result, CVPS and GMP, and
19 their ratepayers would receive the economic benefits from such an
20 uprate.

1 In fact, a sensitivity analysis presented CVPS witnesses Deehan and
2 Cater shows that increasing Vermont Yankee's assumed production by
3 10% changes the \$72 million NPV benefit from the sale in their base
4 case analysis to a \$30 million NPV loss using an eight percent discount
5 rate, and a \$55 million NPV loss using risk adjusted discount rates.³²

6 **Q. DO YOU AGREE WITH THE CLAIM BY CVPS WITNESSES**
7 **DEEHAN AND CATER THAT VYNPC WOULD NOT BE ABLE**
8 **TO ACHIEVE AS MUCH ADDITIONAL OUTPUT AT**
9 **VERMONT YANKEE AS AMERGEN?**

10 **A.** No. Actual operating experience at Vermont Yankee and other BWRs
11 shows that VYNPC could achieve the same additional output as
12 AmerGen. For example, the 1999 Vermont Yankee refueling outage
13 was only 34 days in duration.

14 Moreover, a number of utilities which only own a single nuclear
15 power plant, including Detroit Edison, Washington Public Power
16 System and Alliant Energy already have achieved or are currently
17 seeking power uprates at their plants.

18 **Q. HAVE ANY OTHER WITNESSES FOR VYNPC, CVPS, AND**
19 **GMP OTHER THAN MESSRS. DEEHAN AND CATER**
20 **REFLECTED THE POTENTIAL IMPACT OF A POWER**

1 **UPRATE ON THE RELATIVE ECONOMICS OF THE**
2 **PROPOSED SALE?**

3 A. No. VYNPC witness Wiggett simply dismisses the possibility that the
4 output from Vermont Yankee could be any higher than he has assumed
5 in his analyses.³³ Therefore, he doesn't examine what the relative
6 economics of the proposed sale to AmerGen would be if it were
7 assumed that the output from Vermont Yankee will be above forecast
8 levels. CVPS witnesses Brown and Page do present sensitivity studies
9 in Exhibit ___SWP-6 that examine what happens to the relative
10 economics of the sale if output from Vermont Yankee is below
11 forecast levels. However, they too simply ignore the question of what
12 happens if the output is above forecast levels. Finally, GMP witness
13 Kvedar did not present any independent analysis but relied, instead, on
14 the VYNPC studies.

15 **Q. DO YOU AGREE WITH THE CLAIMS BY WITNESSES FOR**
16 **VYNPC, CVPS AND GMP THAT THE PROPOSED SALE TO**
17 **AMERGEN WOULD PROVIDE QUALITATIVE BENEFITS?**

18 A. Yes. I agree that, in general, the Vermont Yankee owners could
19 eliminate certain risks if they ended their ownership of the plant.

³² Exhibit ___WJD/JCC-3, Tables I and II, Column (3).

1 However, none of the witnesses for VYNPC, CVPS or GMP has
2 attempted to quantify the benefits associated with eliminating these
3 risks. Nor have they examined whether these same benefits could be
4 achieved without the proposed sale.

5 For example, Messrs. Deehan and Cater mention ending Price-
6 Anderson Act nuclear incident liabilities and eliminating exposure to
7 potential NEIL Property Insurance retrospective premium adjustments
8 as potential benefits from the proposed sale. However, these witnesses
9 never mention that neither CVPS nor GMP has ever made any
10 payments for nuclear accident liabilities under the Price-Anderson Act
11 or due to NEIL Property Insurance retrospective premium
12 adjustments.³⁴ Nor do these witnesses mention that these same
13 benefits could be achieved by retiring Vermont Yankee or by divesting
14 the plant in a sale that would be more economically advantageous for
15 ratepayers.

16 The same is true for the claim by Messrs. Wiggett, Brown, Page, and
17 Kvedar that the proposed sale will reduce the significant operating

³³ Testimony of VYNPC witness Bruce Wiggett, at page 39, lines 9 through 15.

³⁴ See GMP's responses to VPIRG/NECNP Data Requests 1-52 and 1-53 and CVPS's responses to Data Requests VPIRG/NECNP 1-70 and 1-71.

1 risks associated with continued ownership.³⁵ The elimination of
2 operating risk cited by these witnesses as a benefit from the proposed
3 sale also could be achieved by retiring Vermont Yankee or by
4 divesting the plant in a sale that would be more economically
5 advantageous for ratepayers.

6 GMP witness Kvedar cites eliminating the risk of future power supply
7 cost uncertainty as a qualitative benefit of the proposed sale. However,
8 locking themselves into a 12 year PPA with prices significantly above
9 projected market prices for at least the first six years hardly seems a
10 reasonable way for CVPS and GMP to protect against future power
11 supply cost uncertainty.

12 **Q. ARE THERE REASONABLE STEPS, OTHER THAN**
13 **ENTERING INTO THE PROPOSED SALE TO AMERGEN,**
14 **THAT THE VERMONT YANKEE OWNERS COULD TAKE TO**
15 **REDUCE DECOMMISSIONING COST UNCERTAINTY?**

16 **A.** Yes. There are a number of alternative steps that the Vermont Yankee
17 owners could take to eliminate much, if not all, of the risk of further
18 escalation in decommissioning costs. First, they could decide to retire
19 the plant in the near future and explore the possibility of entering into

³⁵ For example, see CVPS's responses to Data Requests VPIRG/NECNP 1-65, 1-66, and 1-72.

1 a fixed-price contract for the decommissioning of Vermont Yankee.
2 Second, the existing owners could pursue the offer [PROTECTED
3 MATERIALS³⁶] of the cost
4 of decommissioning the plant. Or, the owners could sign a contract
5 with a qualified contractor other than Entergy.³⁷

6 The owners also could enter into a sale for Vermont Yankee in which
7 VYNPC retained the obligation to decommission the plant, and the
8 existing funds, but the buyer made a significant cash contribution
9 towards the cost of decommissioning. Finally, the owners could enter
10 into a new agreement to sell Vermont Yankee that would be more
11 economically advantageous for ratepayers but in which the
12 decommissioning obligation and funds would be transferred to the
13 buyer, as in the current sale.

14 **Q. HAVE OTHER NUCLEAR POWER PLANT OWNERS**
15 **ENTERED INTO FIXED-PRICE CONTRACTS FOR**
16 **DECOMMISSIONING RECENTLY RETIRED NUCLEAR**
17 **POWER PLANTS?**

³⁶ Protected Materials

³⁷ For example, AmerGen has testified in this proceeding that its decommissioning cost estimate for Vermont Yankee is lower than the current VYNPC estimate. See Testimony of AmerGen witness Duncan Hawthorne, at page 4.

1 A. Yes. The signing of fixed-price contracts for decommissioning
2 appears to be an emerging trend within the nuclear industry. For
3 example, such fixed-price contracts have been signed with
4 decommissioning operations contractors (“DOC”) for the
5 decommissioning of the recently retired Maine Yankee, Connecticut,
6 and Millstone Unit 1 nuclear power plants.

7 **Q. WHAT COSTS ARE INCLUDED WITHIN THE SCOPE OF**
8 **SUCH FIXED PRICE CONTRACTS?**

9 A. I have not been able to review the specific terms of the fixed-price
10 DOC contracts because those agreements are confidential. However,
11 CVPS has indicated that, in general, the Maine Yankee DOC contract
12 covers \$250 million of the total \$541 million, in 1998 dollars, of the
13 current estimated cost for decommissioning the plant and includes the
14 costs to dismantle the nuclear plant, costs for the burial of low-level
15 radioactive waste, costs for site restoration to “greenfield” condition,
16 and capital costs for a dry cask storage facility.³⁸ The fixed-price
17 contract for Connecticut Yankee apparently covers the same
18 approximate scope of work.³⁹ Consequently, many areas that

³⁸ CVPS response to Department of Public Service Formal Data Request 1-7.

³⁹ CVPS response to Department of Public Service Data Request 2-5.

1 traditionally have been exposed to significant cost uncertainty are
2 included within the scope of the fixed-price DOC contract.

3 **Q. WHAT COSTS HAVE NOT BEEN INCLUDED WITHIN THE**
4 **SCOPE OF SUCH FIXED-PRICE CONTRACTS?**

5 A. According to CVPS, the following costs have not been included within
6 the scope of the Maine Yankee fixed-price DOC contract: expenditures
7 in 1997 actual and 1998 prior to the signing of the contract; contracted
8 and management services; labor and staff augmentation costs; fees,
9 insurance and property taxes; \$12.7 million of miscellaneous
10 expenses; and \$6.3 million of purchased power costs.⁴⁰

11 **Q. HAVE YOU SEEN ANY EVIDENCE THAT THE EXISTING**
12 **VERMONT YANKEE OWNERS ARE CONCERNED THAT**
13 **THEY MIGHT CONTINUE TO BE EXPOSED TO SOME RISKS**
14 **EVEN IF THEY COMPLETE THE PROPOSED SALE TO**
15 **AMERGEN?**

16 A. Yes.

17
18 [PROTECTED MATERIALS⁴¹]
19

⁴⁰ CVPS response to VPIRG/NECNP Data Request 2-1.

⁴¹ Protected Materials

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Q. IS IT POSSIBLE THAT VYNPC HAS SUBSEQUENTLY PROVIDED DOCUMENTS THAT GAVE SUCH REASONABLE ASSURANCES TO THE VERMONT YANKEE OWNERS?

A. Yes. However, I don't believe that I have seen any documents in which such assurances were subsequently communicated.

Q. DOES THE PUBLIC SERVICE BOARD HAVE TO APPROVE THE PROPOSED SALE AT THIS TIME?

A. No. Recent developments show that there is now a much more robust market for nuclear power plants than existed last fall when VYNPC entered into the agreement to sell Vermont Yankee to AmerGen. Consequently, a decision at this time by the Board to reject the proposed sale of Vermont Yankee to AmerGen would not foreclose the

1 possibility that a future sale could be completed which would provide
2 more significant economic benefits for ratepayers.

3 **Q. WHAT ARE THE RECENT DEVELOPMENTS WHICH HAVE**
4 **LED YOU TO CONCLUDE THAT THERE IS NOW A MUCH**
5 **MORE ROBUST MARKET FOR NUCLEAR POWER PLANTS?**

6 **A.** My conclusion that there is now a much more competitive market for
7 nuclear power plants is based on the following developments:

- 8
9 1. Since last November, several new utilities have expressed their
10 interest in entering the market to purchase nuclear power plants.
11 Another new market participant has made an unsuccessful bid
12 of nearly a billion dollars for two nuclear plants.
13
- 14 2. The New York Power Authority recently agreed to sell its
15 Indian Point 3 and Fitzpatrick nuclear plants to Entergy for
16 significantly more value than had been received by any seller in
17 any previous nuclear sale.
18
- 19 3. In late December, the staff of the New York State Public
20 Service Commission decided to reject AmerGen's proposed
21 purchase of the Nine Mile Point 1 and 2 nuclear plants in New
22 York State because that sale did not appear to maximize the
23 value of the plants for ratepayers. Within the past week, one of
24 the New York utilities involved in the sale of the Nine Mile
25 Point plants asked the Public Service Commission to terminate
26 the proposed deal and put the plants up for auction because of
27 the increasing interest from other prospective buyers.
28

29 **Q. WHICH UTILITIES HAVE RECENTLY EXPRESSED THEIR**
30 **INTEREST IN PARTICIPATING AS BUYERS IN THE**
31 **NUCLEAR PLANT MARKET?**

1 A. Constellation Nuclear Group, Duke Energy, and the Midwest Nuclear
2 Management Group have all expressed interest in recent months in
3 bidding to buy nuclear power plants.⁴² A fourth utility, Dominion
4 Resources recently has unsuccessfully bid a billion dollars for the two
5 nuclear plants owned by the New York State Power Authority
6 (“NYPA”)

7 **Q. WHY IS IT IMPORTANT THAT ADDITIONAL UTILITIES**
8 **HAVE EXPRESSED THEIR INTEREST IN BIDDING TO BUY**
9 **NUCLEAR POWER PLANTS?**

10 A. The first four nuclear plants divested by their original owners were
11 purchased by either Entergy or AmerGen. It is reasonable to expect
12 that the larger pool of potential buyers who now have expressed
13 interest in participating in the nuclear market will mean more
14 competitive bidding processes and will result in higher prices for
15 nuclear power plants being sold.

16 **Q. WHAT IS THE SIGNIFICANCE OF THE NEW YORK POWER**
17 **AUTHORITY’S RECENT SALE OF TWO NUCLEAR POWER**
18 **PLANTS TO ENTERGY?**

19 A. The recently announced sale of NYPA’s Indian Point 3 and Fitzpatrick
20 nuclear power plants to Entergy is significant for at least four reasons:

⁴² The Energy Daily, November 17, 1999, and November 30, 1999.

1 per kw, or 7.4 times the \$43/kw that the Vermont Yankee owners are
2 due to receive from AmerGen.⁴⁴

3 **Q. HAS NYPA AGREED TO ENTER INTO A POWER PURCHASE**
4 **AGREEMENT WITH ENTERGY AS PART OF THE SALE?**

5 A. Yes. However, the terms of that power purchase agreement are much
6 more favorable than the terms of VYNPC's proposed PPA with
7 AmerGen. First, the NYPA power purchase agreement is only five
8 years in duration, not twelve. Second, NYPA will purchase all of
9 Indian Point 3's output through the end of 2004 and shares of
10 Fitzpatrick power that will decline from 46 percent at the start to 31
11 percent in 2004. Under the agreement NYPA will pay Entergy \$36
12 per MWH for the Indian Point 3 power and \$32 per MWH for the
13 Fitzpatrick power. Both of these prices are lower than the prices that
14 CVPS and GMP will pay for Vermont Yankee power pursuant to the
15 proposed PPA with AmerGen.

16 NYPA also has entered into a second agreement with Entergy for
17 additional Fitzpatrick power at a price of only \$29 per MWH. This
18 additional power will be used to help NYPA's economic development
19 efforts.

⁴⁴ The price of \$43/kw reflects a payment of \$22 million on a July 1,
2000, closing date. If the closing date is after July 1, 2000,

1 In addition, Entergy has agreed to make eight annual cash payments of
2 \$8.5 million to NYPA, for a total of \$68 million, as a result of
3 NYPA's commitment to make these additional purchases of power
4 from the Fitzpatrick plant.

5 Entergy also has agreed to make additional payments to NYPA if the
6 prices for the power from Indian Point 3 and Fitzpatrick plants over
7 the 10 year period beginning with the expiration of the PPA exceed
8 specified amounts.

9 In contrast, VYNPC's proposed PPA with AmerGen would lock the
10 Vermont Yankee owners into paying for at least six years of
11 replacement power at higher than projected market prices.

12 **Q. WILL NYPA HAVE TO MAKE A PAYMENT TO ENTERGY**
13 **TO "TOP-OFF" ITS DECOMMISSIONING FUND?**

14 A. No. NYPA has decided to retain its decommissioning funds and will
15 transfer money to Entergy at the time of decommissioning. However,
16 Entergy has agreed to make 8 annual cash payments of \$11.5 million,
17 for a total of \$92 million, to reduce NYPA's decommissioning
18 obligations.

19 **Q. ARE EITHER OF NYPA'S POWER PLANTS SIMILAR IN**
20 **DESIGN AND VINTAGE TO VERMONT YANKEE?**

AmerGen will pay less than \$43/kw for Vermont Yankee.

1 A. Yes. NYPA's Fitzpatrick nuclear plant is a BWR similar in design
2 and vintage to Vermont Yankee. However, Fitzpatrick is larger than
3 Vermont Yankee and several years older.

4 NYPA's Indian Point 3 plant has a completely different design than
5 Vermont Yankee and entered commercial service three and one-half
6 years later.

7 **Q. WILL NYPA RECEIVE ANY QUALITATIVE BENEFITS FROM**
8 **THE SALE OF ITS NUCLEAR POWER PLANTS TO**
9 **ENTERGY?**

10 A. Yes. Selling the plants will enable NYPA to avoid the nuclear
11 operating risks discussed in this proceeding by witnesses for VYNPC
12 and CVPS. In addition, it appears that by selling its two nuclear
13 plants, NYPA also will get the other qualitative benefits cited by
14 VYNPC, CVPS, and GMP witnesses in this docket.

15 **Q. PLEASE DESCRIBE THE RECENT DEVELOPMENTS**
16 **CONCERNING AMERGEN'S PROPOSED PURCHASE OF THE**
17 **NINE MILE POINT UNIT 1 AND NINE MILE POINT UNIT 2**
18 **NUCLEAR PLANTS.**

19 A. Last June, AmerGen reached agreement with Niagara Mohawk Power
20 Corporation ("Niagara Mohawk") and New York State Electric and
21 Gas ("NYSEG") to purchase the 100% of Nine Mile Point Unit 1

1 owned by Niagara Mohawk and the 59% of Nine Mile Point Unit 2
2 owned by the two utilities. A petition was filed last fall seeking the
3 approval of the New York State Public Service Commission for the
4 sale.

5 Then, in December, Rochester Gas and Electric (“RG&E”), one of the
6 minority owners of Nine Mile Point Unit 2, announced that it was
7 going to exercise its right of first refusal to purchase Nine Mile Point
8 Unit 2 under essentially the same terms as AmerGen had previously
9 offered. RG&E also announced that it had entered into an agreement
10 with Entergy to operate the plant on its behalf.

11 In addition, in late December, the Staff of the New York State Public
12 Service Commission announced that it did not approve of the proposed
13 sale because the deal did not appear to maximize the value of the
14 plants for ratepayers. The Staff then conducted a series of confidential
15 settlement conferences with AmerGen, Niagara Mohawk, NYSEG,
16 and other interested parties. While these conferences were going on,
17 AmerGen announced that it was willing to pay more for the Nine Mile
18 Point plants.

19 However, NYSEG has filed a petition with the New York State Public
20 Service Commission within the past week seeking to terminate the
21 proposed deal with AmerGen and place the Nine Mile plants up for

1 auction. In announcing this move, NYSEG cited the recently
2 completed NYPA sale and the increasing interest in the Nine Mile
3 units from other prospective buyers.⁴⁵

4 **Q. WERE THE TERMS OF THE PROPOSED SALE OF THE NINE**
5 **MILE POINT PLANTS TO AMERGEN THAT HAS BEEN**
6 **REJECTED BY THE NEW YORK STATE PUBLIC SERVICE**
7 **COMMISSION STAFF AND REPUDIATED BY NYSEG MORE**
8 **OR LESS FAVORABLE THAN THE TERMS OF THE**
9 **PROPOSED SALE OF VERMONT YANKEE TO AMERGEN?**

10 A. The terms of the rejected sale of the Nine Mile Point plants to
11 AmerGen were substantially more favorable to the selling utilities than
12 the terms of the proposed sale of Vermont Yankee to AmerGen. For
13 example, AmerGen had agreed to pay \$117/kw for Nine Mile Point 1
14 and \$136/kw for Nine Mile Point 2, for a total of \$163 million for
15 both plants. This was substantially higher than the \$43/kw that
16 AmerGen has agreed to pay for Vermont Yankee.

17 **Q. DO EITHER OF THE TWO NINE MILE POINT NUCLEAR**
18 **POWER PLANTS HAVE DESIGNS OR VINTAGES SIMILAR**
19 **TO THAT OF VERMONT YANKEE?**

⁴⁵ The Energy Daily, April 10, 2000.

1 A. Yes. Like Vermont Yankee, both Nine Mile Point plants are BWRs.
2 Nine Mile Point Unit 1 is slightly larger and slightly older than
3 Vermont Yankee, having entered commercial service three years
4 earlier. Nine Mile Point Unit 2 is a much larger and much newer
5 plant than Vermont Yankee.

6 **Q. DID THE PROPOSED SALE OF THE NINE MILE POINT**
7 **PLANTS TO AMERGEN INCLUDE A POWER PURCHASE**
8 **AGREEMENT?**

9 A. Yes. Niagara Mohawk was to purchase Nine Mile Point 1 power
10 from AmerGen under a 5 year PPA. Niagara Mohawk and NYSEG
11 were both to purchase power from Nine Mile Point 2 under a 3 year
12 PPA. The prices for this power set in the PPA were to have been in
13 the range of \$35/mwh to \$37/mwh. AmerGen had also agreed to a 10
14 year revenue sharing mechanism for the power from Nine Mile Point 2
15 due to begin after the 3 year PPA expired.

16 These terms, in a now repudiated sale, were significantly more
17 favorable than the terms in the proposed Vermont Yankee PPA.

18 **Q. WERE THE PRICES TO BE PAID FOR NINE MILE POINT 1**
19 **AND NINE MILE POINT 2 POWER UNDER THE PROPOSED**
20 **PPA ABOVE FORECAST MARKET PRICES?**

1 A. Yes. In fact, the petitions filed by Niagara Mohawk and NYSEG
2 seeking the approval of the New York State Public Service
3 Commission for the sale specifically noted that that the agreed upon
4 prices might “exceed actual wholesale prices for certain periods during
5 the terms of the PPA.”⁴⁶ However, these petitions subsequently
6 reported that “The possibility that AmerGen will be able to sell power
7 from Nine Mile Station under the PPA at what may be, for some
8 periods, a favorable price has been reflected in a higher asset price to
9 be received by NYSEG and Niagara Mohawk than AmerGen would
10 have agreed to pay in the absence of the PPA.”⁴⁷ Unfortunately, the
11 proposed sale of Vermont Yankee burdens ratepayers with a 12 year
12 PPA at above forecast market prices for at least the first six years but
13 only provides a sale price for the plant that is significantly lower than
14 NYPA will receive or that Niagara Mohawk and NYSEG would have
15 received in the now repudiated Nine Mile Point sale.

16 **Q. WOULD THE PROPOSED SALE OF THE NINE MILE POINT**
17 **NUCLEAR PLANTS HAVE PROVIDED NIAGARA MOHAWK**

⁴⁶ Joint Petition to Transfer Certain Generating and Related Assets to Amergen Energy Company, L.L.C. and for Related Approvals, dated July 23, 1999, at page 17.

⁴⁷ Joint Petition to Transfer Certain Generating and Related Assets to Amergen Energy Company, L.L.C. and for Related Approvals, dated July 23, 1999, at page 17.

1 **AND NYSEG THE SAME QUALITATIVE BENEFITS CITED**
2 **BY WITNESSES FOR VERMONT YANKEE IN THIS**
3 **PROCEEDING?**

4 A. Yes. Selling the plants would have enabled Niagara Mohawk and
5 NYSEG to have avoided the nuclear operating risks discussed in this
6 proceeding by witnesses for VYNPC and CVPS. In addition, it
7 appears that by selling the two nuclear plants, Niagara Mohawk and
8 NYSEG also would have received get the other qualitative benefits
9 cited by VYNPC, CVPS, and GMP witnesses in this docket.

10 **Q. ARE ANY OTHER NUCLEAR PLANT SALES RELEVANT TO**
11 **EVALUATING WHETHER THE BOARD SHOULD APPROVE**
12 **THE PROPOSED SALE OF VERMONT YANKEE?**

13 A. No. The other nuclear power plant sales that have occurred were
14 completed in a significantly less competitive market than appears to
15 exist at this time. The prices for which other utilities may have felt
16 compelled to sell their nuclear plants in that less robust market offer
17 very little, if any, insight into whether the Vermont Yankee owners
18 should be allowed to close the proposed sale to AmerGen.

19 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE**
20 **PROPOSED SALE OF VERMONT YANKEE TO AMERGEN.**

1 A. My conclusions regarding the proposed sale of Vermont Yankee to
2 AmerGen are as follows:

3 1. The testimony and exhibits filed by VYNPC and CVPS in this
4 docket show only a very marginal economic benefit to the
5 existing Vermont Yankee owners, \$51 million NPV, from the
6 proposed sale.

7 2. Even this marginal benefit is [] due to the fact that only
8 61.5 percent of the existing Vermont Yankee owners have
9 elected to buy power from AmerGen under the proposed twelve
10 year PPA. When the fact that 38.5 percent of the existing
11 owners have elected to buy-out of the proposed PPA is
12 considered, [PROTECTED MATERIALS]

13
14 3. Even in the analyses presented in the testimony of VYNPC
15 witness Wiggett and CVPS witnesses Brown and Page, which
16 assume 100% of the existing owners participate in the PPA, the
17 proposed sale to AmerGen would not provide a cumulative
18 NPV economic benefit until the year 2007. If the more realistic
19 assumption that 38.5 percent of the owners buy-out of the PPA
20 is used instead, the proposed sale would
21 [PROTECTED MATERIALS]

- 1 4. It is unrealistic to assume that VYNPC or AmerGen will not
2 seek to increase Vermont Yankee's power level if a decision is
3 made to continue operating the plant to the end of its licensed
4 life in 2012.
- 5 5. The additional revenues that could be expected from shorter
6 refueling outages and the sale of the extra plant output from a
7 power uprate would significantly change the relative economics
8 of the proposed sale to AmerGen.
- 9 6. A sensitivity analysis presented by CVPS witnesses Deehan and
10 Cater shows that increasing Vermont Yankee's assumed
11 production by 10 percent changes the \$72 million NPV benefit
12 shown for the sale in their base case to a \$30 million NPV loss
13 using an eight percent discount rate, and a \$55 million NPV
14 loss using risk adjusted discount rates.
- 15 7. Actual operating experience at Vermont Yankee and other
16 BWRs shows that VYNPC should be able to achieve as much
17 additional output at Vermont Yankee as AmerGen.
- 18 8. The Vermont Yankee owners could reduce or eliminate certain
19 qualitative risks if they ended their ownership of the plant.
20 However, none of the witnesses for VYNPC, CVPS, or GMP
21 has attempted to quantify the benefits associated with

1 eliminating these risks. Nor have they examined whether these
2 same benefits could be achieved without the proposed sale.

3 9. There are a number of alternative steps besides entering into the
4 proposed sale to AmerGen that the Vermont Yankee owners
5 could take to eliminate much, if not all, of the risk of further
6 escalation in decommissioning costs.

7 10. The Vermont Yankee owners could enter into a fixed-price
8 decommissioning contract similar to those that have been made
9 at Maine Yankee, Connecticut Yankee, and Millstone Unit 1.
10 Many areas that traditionally have been exposed to significant
11 cost uncertainty appear to be included within the scope of these
12 fixed-price decommissioning contracts.

13 11. There is no need to rush into the proposed sale to AmerGen.
14 Recent developments show that there is now a much more
15 robust market for nuclear power plants than existed last fall
16 when VYNPC entered into the agreement with AmerGen.
17 Consequently, a decision at this time by the Public Service
18 Board to reject the proposed sale of Vermont Yankee to
19 AmerGen would not foreclose the possibility that a future sale
20 could be completed which would provide more significant
21 economic benefits for ratepayers.

1 14. The Power Purchase Agreement between NYPA and Entergy is
2 for a much shorter duration than the proposed PPA for Vermont
3 Yankee and provides for lower power prices. Entergy also has
4 agreed to pay NYPA \$68 million over an eight year period, as a
5 result of NYPA’s commitment to make additional purchases of
6 power from one of the two plants. Finally, Entergy has agreed
7 to make additional payments to NYPA if over the ten year
8 period beginning with the expiration of the PPA, the prices for
9 the power from the two plants exceeds specified amounts. In
10 contrast, VYNPC’s proposed PPA with AmerGen would lock
11 the Vermont Yankee owners into paying for at least six years of
12 replacement power at higher than projected market prices.

13 15. Last June, AmerGen reached agreement with two New York
14 State utilities to buy all of Nine Mile Point Unit 1 and 59
15 percent of Nine Mile Point Unit 2. In late December, the staff
16 of the New York State Public Service Commission decided to
17 reject AmerGen’s proposed purchase because the sale did not
18 appear to maximize the value of the plants for ratepayers.
19 Within the past week, one of the two utilities involved in the
20 sale asked the Public Service Commission to terminate the

1 proposed deal and put the plants up for auction because of the
2 increasing interest from other prospective buyers.

3 16. The terms of the proposed sale of the Nine Mile Point nuclear
4 plants to AmerGen that has been rejected by the staff of the
5 New York State Public Service Commission and repudiated by
6 one of the two selling utilities were more favorable than the
7 terms of the proposed sale of Vermont Yankee to AmerGen.
8 For example, AmerGen had agreed to pay \$117/kw for Nine
9 Mile Point Unit 1 and \$136/kw for Nine Mile Point Unit 2, for
10 a total of \$163 million. This was substantially higher than the
11 \$43/kw that AmerGen has agreed to pay for Vermont Yankee.
12 The terms of the proposed Power Purchase Agreements for the
13 sale of the power from the Nine Mile Point plants also were
14 significantly more favorable than the terms in the proposed
15 Vermont Yankee PPA.

16 17. The other nuclear power plant sales that have occurred were
17 completed in a significantly less competitive market than
18 appears to exist at this time. Consequently, the prices for which
19 other utilities may have felt compelled to sell their nuclear
20 plants in that less robust market offer very little, if any, insight

1 into whether the Vermont Yankee owners should be allowed to
2 close the proposed sale to AmerGen.

3 18. The proposed sale of Vermont Yankee to AmerGen is not in the
4 public interest.

5 **V. THE SAFETY CONCERNS RAISED BY THE**
6 **PROPOSED SALE OF VERMONT YANKEE**

7
8 **Q. DOES THE ECONOMIC DEREGULATION OF NUCLEAR**
9 **POWER PLANTS AND THE RESULTING INTRODUCTION OF**
10 **COMPETITION CREATE POTENTIAL SAFETY CONCERNS**
11 **AT NUCLEAR UTILITIES?**

12 A. Yes. There is a significant risk that the competitive pressures in a
13 restructured and deregulated market will increase the economic and
14 financial pressures on nuclear plant owners to reduce or eliminate
15 necessary costs, cut corners, defer needed maintenance or
16 improvements, or maximize short term operating performance even
17 when plants should be shut down for repairs.

18 **Q. HAVE YOU SEEN ANY EVIDENCE THAT IN THE PAST**
19 **ECONOMIC PRESSURES HAVE LED TO SAFETY RELATED**
20 **PROBLEMS AT NUCLEAR POWER PLANTS?**

21 A. Yes. Even when nuclear power plants were subject to economic
22 regulation there were many instances where the pressures to cut costs

1 or maximize production led to safety-related problems. In fact, the
2 experiences of Commonwealth Edison, Northeast Utilities, and Maine
3 Yankee illustrate that even strong utilities can experience serious
4 problems when undue emphasis is placed on cutting or containing
5 nuclear plant operating costs or on maximizing near term plant
6 performance.

7 For example, a June 1992 NRC Staff evaluation of the performance of
8 Commonwealth Edison's nuclear plants identified insufficient
9 management attention and resources given to the Company's operating
10 sites during the early to mid-1980s as one of the root causes of
11 subsequent performance weaknesses:

12 CECo undertook an ambitious nuclear construction effort
13 that culminated in the mid-1980's with the completion of
14 six nuclear units; two each at LaSalle, Braidwood, and
15 Byron. During this time, corporate oversight and
16 resources were focused on what CECo considered to be
17 the high priority task of completing this construction
18 effort. The amount of monetary and personnel resources
19 expended on the older plants suffered. In many cases,
20 experienced personnel were diverted from older plants to
21 new plant construction and startup....

22
23 As a consequence, performance of the older stations did
24 not keep pace with the rest of the industry. This was at a
25 time when most of the industry was focusing strongly on
26 improved operating plant performance. CECo did not
27 make the same progress at its operating plants in
28 improving the control of operations, maintenance, outage
29 activities, equipment/material condition, corrective
30 action/root cause analysis, personnel performance, and

1 communications. The effects of this diversion of
2 resources and management attention from older plants to
3 construction through the mid-80s is, to some extent, still
4 evident today in hardware deficiencies, difficulty in
5 changing longstanding ways of doing business, and weak
6 procedures at the older units.⁴⁸

7
8 Subsequent assessments by Commonwealth Edison and evaluations by
9 the NRC and the Institute of Nuclear Power Operations (“INPO”)
10 agreed that pressures to reduce costs and maximize production had led
11 to subsequent performance problems at eight of the utility’s twelve
12 nuclear plants. For example, INPO also told the Company’s Board of
13 Directors in March 1996 that a strong emphasis, “indeed over-
14 emphasis” on budget, without first emphasizing performance, had
15 “clearly been a major impediment to success” and had “had far
16 reaching detrimental effects.”⁴⁹ INPO subsequently told
17 Commonwealth Edison’s Board of Directors in September of 1997 that
18 nuclear safety performance frequently had not taken precedence over
19 meeting short-term financial targets.⁵⁰

20 An internal Commonwealth Edison assessment similarly attributed the
21 declining material condition of the Company’s LaSalle Nuclear Station

⁴⁸ NRC SECY-92-228, issued on June 25, 1992, at pages 3-4.

⁴⁹ INPO Briefing Materials for March 14, 1996, Meeting with the ComEd Board of Directors, Attachment 4, at page 3.

⁵⁰ INPO Briefing Materials for September 10, 1997, Meeting with the ComEd Board of Directors, Attachment 2, at page 15.

1 to management's over-emphasis on "the importance of achieving
2 short-term production goals, at the cost of accepting temporary fixes
3 [to equipment problems], without a corresponding focus on long-term
4 issue resolution."⁵¹

5 **Q. DID SIMILAR ECONOMIC PRESSURES LEAD TO**
6 **PERFORMANCE PROBLEMS AT NORTHEAST UTILITIES'**
7 **MILLSTONE NUCLEAR PLANTS?**

8 A. Yes. Utility-sponsored assessments and audits by the NRC and the
9 Connecticut Department of Public Utility Control have concluded that
10 Northeast Utilities experienced serious regulatory problems in the mid-
11 and late-1990s as a result of having had an undue focus on economic
12 issues since the mid-1980s.

13 For example, a 1996 audit of Northeast Utilities sponsored by the State
14 of Connecticut Department of Public Utility Control reached the
15 following conclusions:

- 16 • The NU Nuclear Organization had been mismanaged for the
17 previous ten years. NU executive management had lost focus on
18 the safe operation of the nuclear units, placing primary
19 importance on financial issues, geographical expansion and the
20 pending threat of wholesale and retail competition. Executive
21 management's frequent statements over this period that nuclear
22 safety was their primary concern had been hollow. As a result,
23

⁵¹ Commonwealth Edison April 1995, LaSalle Nuclear Station Course of Action, at page 67.

1 the plant equipment and processes at best had failed to keep up
2 with industry standards and, at worst, had significantly
3 deteriorated.

- 4
- 5 • NU management had lost the trust and confidence of a
6 significant fraction of the Nuclear Organization workforce. The
7 primary cause has been a mixed message regarding corporate
8 goals related to cost, financial matters, and production, as
9 opposed to safety and regulatory compliance considerations....
10 Management's emphasis on cost containment and production
11 had overwhelmed the safety culture which once existed at
12 Millstone Station.⁵²

13

14 It is significant that Northeast Utilities had been considered to be a
15 strong performer through the late 1980s and a leader in the nuclear
16 industry. Plant operating performance and SALP scores were
17 generally very good. The Company's decline coincided with the
18 placement of an undue emphasis on economic issues.

19 **Q. WHAT EVIDENCE HAVE YOU SEEN THAT SHOWS THAT**
20 **ECONOMIC PRESSURES LED TO SAFETY CONCERNS AT**
21 **THE MAINE YANKEE NUCLEAR PLANT?**

22 **A.** The NRC conducted an Independent Safety Assessment Team ("ISA")
23 inspection at Maine Yankee in 1996. The October 7, 1996, Report of
24 this ISA inspection concluded that the economic pressures to be a low-
25 cost energy producer had been one of the two underlying root causes

1 for performance problems at the plant.⁵³ These economic pressures had
2 led to limitations on resources which delayed and deferred needed
3 plant upgrades, improvements and lower priority corrective actions. In
4 fact, the NRC ISA report found that “Projects which would likely
5 have prevented problems were unfunded because of budget limits.”⁵⁴
6 The NRC ISA report also concluded that economic pressures had
7 created an environment at Maine Yankee where management was
8 willing to accept existing deficient conditions without having them
9 corrected.

10 Most significantly, the NRC ISA report found that Maine Yankee had
11 not previously been a high cost producer where management had been
12 forced to make significant cuts in staffing and resources in order to
13 make the unit competitive:

14
15 Like all licensees, the Maine Yankee Atomic Power
16 Company (MYAPCo) has experienced competitive
17 pressure to generate power at low cost. However,
18 unlike others, Maine Yankee has not engaged in
19 drastic staff reductions, work process reengineering
20 or other budget cutback efforts to maintain

⁵² R.C. Brown & Associates “Focused Audit of the Connecticut Light & Power Company Nuclear Operations,” issued December 31, 1996.

⁵³ NRC Independent Safety Assessment Report for Maine Yankee, October 7, 1996, at page 71.

⁵⁴ NRC Independent Safety Assessment Report for Maine Yankee, October 7, 1996, at page 67.

1 competitiveness because it has historically maintained
2 a lean and efficient organization. Staffing levels and
3 budget expenditures have been constrained to that
4 necessary to generate power efficiently.⁵⁵
5

6 The owners of Maine Yankee retained consultants during 1996 to
7 conduct an assessment of the culture at the plant. The report of this
8 cultural assessment team (“CAT”) noted that competitive pressures
9 had led to safety concerns at the plant. For example, the CAT reported
10 that workers at the plant believed that management didn’t want to hear
11 about problems that could lower power production and that cutting
12 corners to meet tight work schedules was necessary and tolerated.⁵⁶

13 The Maine Yankee CAT Report further noted that the economic and
14 political environment facing Maine Yankee at the time was considered
15 “precarious” and the plant’s survival was seen to be based on
16 maintaining low costs and achieving high production. This led to a fear
17 among many workers that “highlighting any negative issue could
18 endanger the plant’s continued operation.” Moreover, the report said
19 “No one wants to be responsible for a premature plant shutdown and
20 decommissioning.”

⁵⁵ NRC Independent Safety Assessment Report for Maine Yankee,
 October 7, 1996, at page 67.

⁵⁶ Nucleonics Week, June 27, 1996, at page 1.

1 Although the cultural assessment report concluded that nuclear safety
2 was considered the first priority at Maine Yankee, cost was a second
3 priority. Workers told the cultural assessment team that over the years
4 money was spent only on areas that required it – primarily on safety
5 and regulatory issues. Expenditures were rarely made on non-essential
6 items, including preventive measures, so that while costs were kept
7 down, workers believed that the material condition of the plant had
8 deteriorated to the point where substantive improvements needed to be
9 made. However, workers believed that a clear message from
10 management was that further, major problems or events requiring
11 significant expenditures could lead to a premature, permanent
12 shutdown.

13 **Q. HAVE YOU REVIEWED THE FEBRUARY 23, 2000,**
14 **AFFIDAVIT CONCERNING THE PROPOSED SALE TO**
15 **AMERGEN THAT WAS FILED AT THE U.S. NUCLEAR**
16 **REGULATORY COMMISSION BY WILLIAM K. SHERMAN,**
17 **THE VERMONT STATE NUCLEAR ENGINEER?**

18 **A. Yes.**

19 **Q. DO YOU AGREE WITH THE CONCLUSIONS REACHED BY**
20 **MR. SHERMAN IN THAT AFFIDAVIT?**

1 A. Yes. I agree with the following conclusions reached by Mr. Sherman
2 in his affidavit:

- 3 • There is no guarantee that AmerGen's owners will be liable for
4 any more than \$110 million.
- 5
- 6 • There is no guarantee that operating costs will provide an
7 adequate source of funds to meet Vermont Yankee's ongoing
8 operational expenses for an unanticipated six-month outage.
9
- 10 • There is no guarantee that any of AmerGen's net income will be
11 available to fund future operational shortfalls.
12
- 13 • Simultaneous six-month outages at more than one of
14 AmerGen's plants are a reasonable possibility.
15
- 16 • AmerGen is susceptible to events which could lead to
17 simultaneous outages at more than one plant.
18
- 19 • Immediate entry into decommissioning is not an alternative for
20 insufficient funding.
21
- 22 • The \$110 million pledged by AmerGen's owners is not
23 sufficient to pay the full costs of a six-month outage at Vermont
24 Yankee considering scenarios which might reasonably occur.
25

26 **Q. ARE YOU AWARE OF ANY INSTANCES IN WHICH**
27 **UTILITIES HAVE EXPERIENCED SIMULTANEOUS**
28 **EXTENDED OUTAGES OF TWO OR MORE NUCLEAR**
29 **POWER PLANT?**

30 A. Yes. There have been numerous instances where two or more of a
31 utility's nuclear plants have been out of service at the same time for
32 six months or longer due to problems that arose as a result of an

1 emphasis on reducing costs, deficiencies in the utility's safety culture,
2 management problems, or generic or plant-specific technical issues.

3 For example:

4
5 * Two of the three units at the Palo Verde Nuclear Generating
6 Station were shut down at the same time for approximately
7 twelve months starting in March 1989. During this same twelve
8 month period, the third Palo Verde unit was shut down for
9 numerous outages, including one outage that lasted
10 approximately four months.

11
12 * The two units at the South Texas nuclear plant were both shut
13 down for the twelve month period February 1993 to February
14 1994.

15
16 * All five of TVA's operating nuclear power plants were shut
17 down in 1985. The first unit to be restarted, Sequoyah Unit 1,
18 re-commenced commercial operations in May 1989.

19
20 * All three units at Northeast Utilities' Millstone nuclear plant
21 were shut down for multi-year outages starting in March of
22 1996.

23
24 * Commonwealth Edison has experienced numerous simultaneous
25 extended outages among the eight units at its Dresden, LaSalle,
26 Quad Cities, and Zion nuclear stations. For example, during the
27 first six months of 1996, the utility had at least three units shut
28 down at any one time for extended outages of longer than three
29 months in duration. Commonwealth Edison had at least four
30 units shut down at any one time for extended outages during the
31 last six months of 1996, except for a short period at the end of
32 August and early September. The utility also experienced
33 simultaneous outages of at least six months in length at its two
34 unit Zion nuclear station from October 1993 through April 1994
35 and at its two unit LaSalle Station from September 1996
36 through 1998.

1 * Both units at the D.C. Cook Nuclear Plant in Michigan were
2 shutdown in September 1997. These units remain shutdown at
3 this time.

4
5 * Both units at the Salem Nuclear Station were shutdown for
6 more than two years between July 1995 and the fall of 1997.

7
8 * Both units at the Brunswick nuclear plant were shutdown for the
9 twelve month period April 1992 through April 1993.

10
11 * Both units at the Calvert Cliffs nuclear plant were shut down at
12 the same time for more than one year starting in May 1989.

13
14 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING NUCLEAR**
15 **SAFETY ISSUES?**

16 A. My conclusions regarding the nuclear safety issues raised by the
17 proposed sale of Vermont Yankee are as follows:

18 1. There is a significant risk that the competitive pressures in a
19 deregulated market will increase the economic and financial
20 pressures on nuclear plant owners to reduce or eliminate
21 necessary costs, cut corners, defer needed maintenance or
22 improvements, or maximize short term operating performance.

23 2. Even when power plants were subject to economic regulation,
24 there were many instances in which the pressures to cut costs or
25 maximize production led to safety-related problems.

26 3. Commonwealth Edison, Northeast Utilities and Maine Yankee
27 were three examples of strong utilities that experienced serious

1 problems after undue emphasis was placed on cutting or
2 containing nuclear plant operating costs or on maximizing near
3 term plant performance.

4 4. I agree with the following conclusions reached by the Vermont
5 State Nuclear Engineer in his February 23, 2000, Affidavit to
6 the NRC:

- 7 • There is no guarantee that AmerGen's owners will be
8 liable for any more than \$110 million.
- 9
10 • There is no guarantee that operating costs will provide an
11 adequate source of funds to meet Vermont Yankee's
12 ongoing operational expenses for an unanticipated six-
13 month outage.
- 14
15 • There is no guarantee that any of AmerGen's net income
16 will be available to fund future operational shortfalls.
- 17
18 • Simultaneous six-month outages at more than one of
19 AmerGen's plants are a reasonable possibility.
- 20
21 • AmerGen is susceptible to events which could lead to
22 simultaneous outages at more than one plant.
- 23
24 • Immediate entry into decommissioning is not an
25 alternative for insufficient funding.
- 26
27 • The \$110 million pledged by AmerGen's owners is not
28 sufficient to pay the full costs of a six-month outage at
29 Vermont Yankee considering scenarios which might
30 reasonably occur.

31
32 5. There have been numerous instances where two or more of a
33 utility's nuclear power plants have been out of service at the

1 same time for six months or longer due to problems that arose
2 as a result of an emphasis on reducing costs, deficiencies in the
3 utility's safety culture, management problems, or generic or
4 plant-specific technical issues.

5 6. The Public Service Board should take all reasonable steps to
6 ensure that AmerGen or whatever entity may purchase Vermont
7 Yankee commits adequate resources to operate and
8 decommission the plant in a safe manner.

9 **Q. DOES THIS COMPLETE YOUR TESTIMONY AT THIS TIME?**

10 A. Yes. However, I have just received additional documents from
11 AmerGen. If necessary, I will supplement this testimony once I have
12 had a reasonable opportunity to review those documents.

13

14

15