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HAND DELIVERED

Douglas Patch, Chairman  
Nuclear Decommissioning Financing Committee  
NH Public Utilities Commission  
8 Old Suncook Road  
Concord, NH 03301

Re: NDFC 98-1

Dear Chairman Patch:

Enclosed are the following: (1) rebuttal testimony by Mr. Callendrello; (2) rebuttal testimony by Mr. LaGuardia; and (3) the opening statement of North Atlantic.

Sincerely,

Edward A. Haffer

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Enclosures

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NUCLEAR DECOMMISSIONING FINANCING COMMITTEE

OPENING STATEMENT OF  
NORTH ATLANTIC ENERGY SERVICE CORPORATION

North Atlantic Energy Service Corporation ("North Atlantic") addresses the following major issues in this proceeding: (1) anticipated energy producing life (including but not limited to steam-generator issues); (2) the most appropriate method for decommissioning the plant; (3) the funding method; (4) the adequacy of assurance of collection; (5) the adequacy and accuracy of the decommissioning cost estimate; and (6) escalation and contingency factors.

North Atlantic's positions on these issues may be summarized as follows. As to Issue 1, it anticipates that the plant will be capable of producing energy at least to the expiration date of its operating license in October 2026, a total of 36 years. Although there has been recent industry experience with plants that have shut down prematurely, there is also evidence that plants will operate well beyond 25 years. Installed at Seabrook Station are Westinghouse Model F steam generators. These have improved tube material, and involve chemistry control regimens that have been proven to mitigate many of the problems that have caused other plants to perform major repairs and steam generator

replacements. See the testimony of Messrs. Callendrello and LaGuardia.

As to Issue 2, North Atlantic continues to believe that the most appropriate method for decommissioning Seabrook Station is prompt removal and dismantlement ("DECON"). This method is the most cost-effective and efficient. See the testimony of Messrs. Callendrello and LaGuardia.

As to Issue 3, North Atlantic continues to believe that "escalating funding" is the most appropriate funding method. By this method, funding escalates annually with inflation, so that each generation of customers pays the same proportional share of the ultimate cost of decommissioning, in terms of purchasing power, over the anticipated energy-producing life of the plant. The funding is implemented in a way that is sensitive to federal income tax issues. See the testimony of Messrs. Jacobson and Spitzer and Ms. Hieronymus.

As to Issue 4, all of the Joint Owners have met and continue to meet monthly funding obligations. The enactment of Senate Bill 140 addresses the funding assurance issue that had arisen concerning Great Bay Power Corporation. The new law establishes a procedure for designating the Joint Owners as proportional guarantors of the decommissioning obligations of any Joint Owner without a franchise territory. Restructuring in other New England states has provided additional assurance of funding

through the collection of decommissioning costs via a wires charge to customers. See the testimony of Messrs. Callendrello and Jacobson.

As to Issue 5, North Atlantic believes that the site-specific cost estimate prepared by TLG Services for the decommissioning of Seabrook Station is adequate and accurate. That estimate is \$473.6 million in 1998 dollars. However, in 1998, for the first time, the NRC minimum value has exceeded the Seabrook site-specific estimate. The NRC minimum value is \$489 million in 1998 dollars. Because this value exceeds the site-specific estimate, the NRC minimum value has been adopted. Comparisons with the estimates for other plants that have recently announced the start of decommissioning show that Seabrook's estimate, when adjusted for the factors unique to those sites, is nearly the same as, or exceeds, those other estimates. See the testimony of Messrs. Callendrello, LaGuardia, and Jacobson.

As to Issue 6, North Atlantic recommends a 5% cost escalation factor for decommissioning. The methodology underlying this factor breaks a cost estimate down into major categories, such as material, energy, labor, low level radioactive waste disposal, and "other." It then applies appropriate cost escalation factors from recognized data sources. North Atlantic also recommends two special contingency factors.

The first relates to low level radioactive waste disposal costs. This contingency is \$20 million in 1998 dollars. The second special contingency is based on an assumed delay of 5 years in the removal of spent fuel from the site. This contingency is approximately \$11.9 million in 1998 dollars.

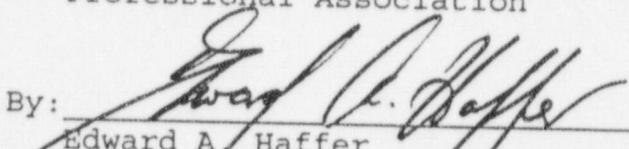
Respectfully submitted,

NORTH ATLANTIC ENERGY SERVICE  
CORPORATION  
By its attorneys,

Sheehan Phinney Bass & Green  
Professional Association

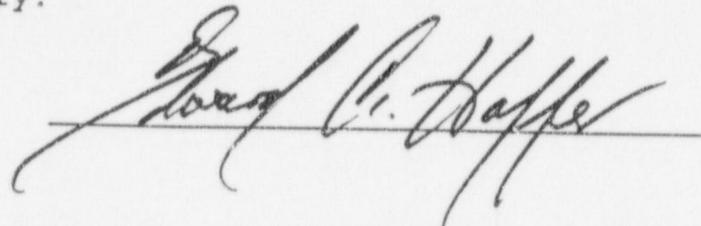
DATED: September 3, 1998

By:

  
Edward A. Haffer  
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CERTIFICATION

I hereby certify that a copy of the foregoing has this 3rd day of September, 1998 been forwarded to the attached Service List and to the State Library.



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1 REBUTTAL TESTIMONY

2 of

3 A. M. Callendrello

4

5 Q. Are you the same Anthony M. Callendrello that filed direct testimony for  
6 these proceedings?

7

8 A. Yes I am.

9 Q. What is the purpose of this testimony?

10

11 A. The purpose of my testimony is to rebut and clarify certain of the contentions and  
12 positions in the direct testimony filed by James S. Robinson on behalf of the New  
13 England Power Company, the direct testimony of Robert A. Backus on behalf of the  
14 Campaign for Ratepayer's Rights, the direct testimony of James R. Anderson on behalf  
15 of the New Hampshire Office of the Consumer Advocate, and the direct testimony of  
16 Tracy Brooks Guyette on behalf of the New Hampshire Public Utilities Commission.

17

18 Regarding the testimony of James S. Robinson:

19

20 Q. What is your position on New England Power Company's assertion that  
21 industry experience and recent events make it clear that it is no longer reasonable to  
22 expect that Seabrook Station will operate for its maximum license term?

1     A.     I believe that New England Power Company inappropriately assumes that the  
2     specific experience for eleven commercial operating nuclear power plants in the United  
3     States that have been shutdown prior to the expiration of their operating licenses over the  
4     last nine years is applicable to Seabrook Station. In spite of the fact that each of the  
5     eleven plants cited in the testimony is an individual case, each with its own unique set of  
6     parameters and circumstances, New England Power Company assumes that each of these  
7     individual cases is applicable to Seabrook Station and also that it is somehow appropriate  
8     to apply the numerical average of the operating durations of these plants as a proxy for  
9     the expected commercial life of Seabrook Station. I do not believe that the question of  
10    Seabrook Station's anticipated energy producing life will yield to such a simplified view  
11    of the industry, nor should it ignore the operating experience that leads to a conclusion  
12    that operating lives longer than 25 years are achievable. Seabrook Station's future is  
13    more likely to be driven by how well it performs, how successful it can be in managing  
14    its costs without compromising good performance, and how its costs stack up against the  
15    available price of power in the market place. These factors cannot be addressed by  
16    looking at the past performance of other nuclear plants whose circumstances may or may  
17    not apply to Seabrook Station's past, present, or future.

18

19    Q.     **What is your position on New England Power Company's assertion that the**  
20    **principal reason for each of the recent shutdowns was economic?**

21

1 A. The New England Power Company position is an oversimplification of a highly  
2 complex matter. I think it is fair to say, just as New England Power Company has stated  
3 in another portion of their testimony, that the eleven plants it discusses were *ultimately*  
4 (emphasis added) shutdown for economic reasons. I think there is an important  
5 distinction to be made between the *principal* reason and the *ultimate* reason. I doubt if  
6 anyone would argue with the assertion that economics is the ultimate reason for the  
7 closure of any power plant, but this assertion is not particularly informative or useful.  
8 What is useful is insight into the factors that drove the plants to an economic end. Among  
9 these factors will be one or several key reasons, the *principal* reasons, that led any given  
10 plant to close. These reasons are often not, in and of themselves, economic, but they have  
11 often had a major impact on the economics. Each of the eleven plants discussed in the  
12 New England Power Company testimony has its own principal reasons that led to its  
13 ultimate closure. Some were simply too small (Big Rock Point) or too specialized (Fort  
14 St. Vrain) to survive any longer than they did. Some encountered extended shutdowns  
15 due to significant operational or regulatory problems ("major problem spells" as  
16 characterized in the 1995 paper by Rust and Rothwell-*On the Optimal Lifetime of*  
17 *Nuclear Power Plants*- discussed in the testimony of Tracy Guyette). Others encountered  
18 a combination of these factors. In many cases it is inappropriate to characterize these  
19 major contributing reasons for closure as being principally economic. Each plant,  
20 including Seabrook Station, must be evaluated on its specific circumstances. As the Rust  
21 and Rothwell study concludes, under ordinary operating conditions, that is, in the absence  
22 of "major problem spells" (a continuous shutdown of greater than 9 months), there is

1 virtually no chance that a nuclear power plant will be closed. I do not believe it is  
2 appropriate to assume that the "major problem spells" of owners should be applied to  
3 Seabrook Station for purposes of decommissioning planning.

4

5 **Q. What is your position on New England Power Company's characterization of**  
6 **the significance of the closing of the Zion units?**

7

8 A. New England Power Company asserts that the shut down of these units  
9 demonstrates that even with the potential economies of scale of a two unit site and the  
10 support of an organization that operates twelve nuclear units, these units were not seen to  
11 be economic over the long term. Again, I believe that this characterization is an  
12 oversimplification and ignores the impact of the extensive operational and regulatory  
13 problems with these units. Although Unicom was quoted as saying the decision to close  
14 the units was based on economics, what was left unaddressed in the Unicom statement  
15 was their position on the principal versus ultimate reasons for the closure. Obviously, the  
16 ultimate reason was economics--the cost to operate versus the expected return--but there  
17 can be little doubt that the long history of problems and the multiple appearances  
18 (January 1991-February 1993 and January 1997-July 1998) of these units on the NRC  
19 "watch list" had a significant impact on the decision. It is common knowledge in the  
20 industry that it is economically painful to recover from the "watch list" status. Clearly,  
21 the Zion units experienced their "major problem spells". Some plants can ride out and  
22 survive such spells. Others cannot. It all depends upon their specific circumstances. The

1 more obvious conclusion to be drawn from the experience of the Zion units is that in their  
2 case the benefits of a multi-unit site and multi-unit operating organization was not  
3 sufficient to compensate for long standing operational problems. The key to success in  
4 this business is ongoing, safe and successful operations.

5

6 **Q. What is your position on New England Power Company's observations**  
7 **regarding "finite life syndrome"?**

8

9 A. Clearly, the economics of a major capital addition are progressively more  
10 challenging as a plant gets older and less and less time remains to recover the investment.  
11 On the other hand, New England Power Company's position fails to address the effect of  
12 plant life extension through the license renewal process. Recently, applications for 20  
13 year license extensions have been filed by the owners of five nuclear plants at what is  
14 projected to be an ultimate cost of \$15-to-\$20 million. Applications for plant life  
15 extension are being considered for a number of other plants. Plant life extension is an  
16 important and significant factor that must be taken into consideration in any discussion  
17 of anticipated energy producing life since license extension can offset "finite life  
18 syndrome".

19

20 **Q. What is your position on New England Power Company's assertion that cost**  
21 **allocations to Seabrook Station from the operating company's nuclear services**

1 organization and corporate support functions will increase as the industry matures  
2 and fewer plants are operated?

3

4 A. The specific observation concerning Northeast Utilities implies: (1) that additional  
5 operating NU plants will be retired and impact Seabrook Station's costs, (2) that the size  
6 and cost for related support services and corporate support functions will not be  
7 correspondingly reduced in the event that additional plants are retired, and (3) that the  
8 owners of Seabrook Station have no available alternatives or recourse to such cost  
9 increases. The first two implications are speculation. Even if they were true, the owners  
10 of Seabrook Station have available recourses to reduce these costs, including going to a  
11 source other than NU for such services and/or hiring a non-NU company as the plant  
12 operator.

13

14 Q. What is your position on New England Power Company's assertion that an  
15 excellent operating record may not be enough to prevent a premature plant  
16 shutdown when economic conditions warrant it?

17

18 A. I do not disagree with the general assertion. Clearly, it is possible that a plant with  
19 an excellent operating history could find itself in a position where their economics would  
20 not justify continued operations. Regarding the specific examples provided, some  
21 clarification is warranted. There can be no question that Yankee Rowe, Connecticut  
22 Yankee, and Maine Yankee had long histories of good to excellent operations. However,

1 it is also true that each of these units ran into problems of various kinds that contributed  
2 significantly to unfavorable economics and the decision to retire these units. On the other  
3 hand, the good operating and safety record of the 24-year old TMI-I plant was one of the  
4 principal reasons that AmerGen cited in its purchase of the plant. I do not mean to imply  
5 that Seabrook Station is immune to such potential "problem spells", but I do think it is  
6 important to recognize this factor for these three New England plants and caution against  
7 characterizing them as otherwise excellent plants that, for reasons beyond their control,  
8 came face to face with economics one day and had to close. Their situations were much  
9 more complex than that. Again, I feel strongly that each plant must be assessed in terms  
10 of its specific situation, and I caution against generalizations.

1       **Q.     What is your position on New England Power Company's assertion that**  
13      **Seabrook Station will be among a shrinking number of plants as others retire and**  
14      **that the population of nuclear services vendors will decrease?**

15

16      A.     First, the assertion ignores the impact of plant life extension and license renewal.  
17     I discussed my views on these matters in response to an earlier question. Second, the  
18     assertion ignores the impact of expanded nuclear power generation work overseas and the  
19     impact that this business will have on the availability of nuclear services vendors in the  
20     United States. I believe that New England Power Company's characterization of the  
21     future of the nuclear utility business is highly speculative and that a healthy nuclear  
22     utility business in the future is also a plausible scenario.

1

2 In the recent sale of the Westinghouse Electric Company to a consortium of Morrison-  
3 Knudsen and British Nuclear Fuels, the buyers stated that they remain dedicated to the  
4 nuclear energy business. This is possibly because they see the nuclear business as a  
5 global one and, as I stated earlier, nuclear plant construction is continuing in the overseas  
6 markets.

7

8 Q. Do you have a position on New England Power Company's positions  
9 regarding intergenerational inequity?

10

11 A. Yes I do. The New England Power Company position may be valid if Seabrook  
12 Station does not operate more than about twenty-five years, the time period over which  
13 New England Power Company advocates that decommissioning funding should occur.  
14 As I have stated earlier, I believe that New England Power Company has provided no  
15 valid basis for their assertion that Seabrook Station will be retired in about twenty-five  
16 years. In the absence of any compelling arguments to support an assumed forced  
17 retirement in 2015, North Atlantic considers that the proposed accelerated funding--with  
18 or without a levelized approach--is conservative, and will result in customers over the  
19 first twenty-five years of operation paying a disproportionate share of the  
20 decommissioning cost.

21

1    Q.    In your direct testimony you presented evidence that operation beyond 25  
2    years was not only feasible, but had been accomplished by fifteen plants. Is there  
3    additional evidence that would lead you to conclude that operation beyond 25 years  
4    can be expected?

5

6    A.    Yes there is. First is the activity that has taken place with plant life extension. As  
7    I mentioned earlier, applications for a licensee to operate an additional 20 years have been  
8    filed with the NRC for five plants. One of those plants has been in commercial operation  
9    for 25 years, one for 24 years, two for 23 years and one for 21 years. These utilities have  
10   invested substantial resources into extending these licenses, and they clearly believe they  
11   can operate these plants well beyond 25 years.

12

13   Second, it was announced on July 17, 1998, that AmerGen Energy Company (a joint  
14   venture of PECO Energy and British Energy) purchased Three Mile Island Unit 1. This  
15   plant went into commercial operation in September 1974, almost exactly 24 years ago.  
16   AmerGen's plan is to operate Three Mile Island Unit 1 and, presumably, do so at a profit.  
17   This is evidence that a plant with a good operating and safety record will be able to  
18   continue operating, even in a competitive environment.

19

20   Q.    Would you please summarize your rebuttal positions regarding the New  
21   England Power Company testimony?

22

1    A.    In their summary remarks regarding the expected service life New England Power  
2    Company states that no commercial nuclear power plant has operated for the full duration  
3    of its NRC license. This does not mean that Seabrook Station or other currently  
4    operating nuclear plants cannot or will not operate for the duration of the current licenses  
5    or that some of these plants cannot or will not obtain license extensions and operate even  
6    longer than their current licensed life.

7

8    In these summary remarks New England Power Company states that the average  
9    operating lives for the eleven plants permanently retired thus far was about 23 years, that  
10   other plants appear to be targets for early retirement, and that four of New England's nine  
11   nuclear units have been retired early. Looking at only shut down plants ignores the fact  
12   that nearly 90% of the plants that began commercial operation in the period from 1970 to  
13   1974 are still operating<sup>1</sup>. This means it is much more likely than not that Seabrook  
14   Station or other currently operating nuclear plants will operate for greater than 25 years.  
15   Again, each plant is unique and must be evaluated on its own merits and in the context of  
16   its particular circumstances.

17

18   New England Power Company argues that the number of plants will continue to decline  
19   through the early part of the next century and that this decline will likely increase the cost  
20   of doing business. Such cost increases are speculative at best and may be largely offset

---

<sup>1</sup> It should be noted that Attachment 1 to my April 14, 1998 testimony contained several errors. The number of total plants licensed in the years 1970-1974 and the number of plants currently operating is 34 and 31, respectively. A corrected Attachment 1 is provided.

1 by the effects of plant life extension, the expansion of the industry in other countries, and  
2 the application of advanced plant designs. This factor is too speculative to form a basis  
3 for any decisions on Seabrook Station's anticipated energy producing life.

4

5 While there will likely be selected plants that shut down before their full licensed life,  
6 New England Power Company has presented no compelling reasons for its assertion that  
7 Seabrook Station--or many other plants for that matter--cannot or will not be operated for  
8 its full licensed life or longer. In the absence of such compelling reasons, North Atlantic  
9 believes it is overly conservative to accelerate the funding for Seabrook Station's  
10 decommissioning.

11

12 **Regarding the testimony of Robert A. Backus:**

13

14 Q. To what extent does your rebuttal testimony above regarding the testimony  
15 of New England Power Company apply to the testimony of the Campaign for  
16 Ratepayer's Rights?

17

18 A. Both New England Power Company and the Campaign for Ratepayer's Rights  
19 have relied upon industry experience to date as a basis for concluding that Seabrook  
20 Station will not achieve its full licensed life. For the reasons discussed in my earlier  
21 rebuttal testimony on New England Power Company's testimony, I do not believe that  
22 this is appropriate. I will not repeat these arguments, but I do have additional rebuttal

1 testimony on several related aspects of the testimony from the Campaign for Ratepayer's  
2 Rights as well as rebuttal testimony on other matters, including the Campaign for  
3 Ratepayer's Rights' assertion that North Atlantic's estimate for decommissioning is  
4 understated.

5

6 **Q. Regarding the summary of the positions of the Campaign for Ratepayer's**  
7 **Rights on page 2, do you believe that the Campaign for Ratepayer's Rights has**  
8 **correctly represented the New England Power Company position?**

9

10 A. I do not. New England Power Company has not advocated an accelerated  
11 funding period to begin at the date of licensing (1986) as characterized by the Campaign  
12 for Ratepayer's Rights. The New England Power Company testimony advocates a  
13 funding period of twenty-five years from commercial operation (1990).

14

15 Q. Do you have any comments on the Campaign for Ratepayer's Rights'  
16 position that the NDFC should urge the NRC to impose joint and several liability on  
17 the Seabrook Station owners?

18

19 A. Yes. This action is unnecessary. In its Final Policy Statement on the  
20 Restructuring and Economic Deregulation of the Electric Utility Industry, issued on  
21 August 19, 1997, the NRC said:

1        "The NRC is concerned about the effects on the availability of operating  
2        and decommissioning funds, and about the division of responsibility for  
3        operating and decommissioning funds, when co-owners file for  
4        bankruptcy or otherwise encounter financial difficulty. The NRC  
5        recognizes that co-owners and co-licensees generally divide costs and  
6        output from their facilities using a contractually defined pro rata share  
7        standard. The NRC has implicitly accepted this practice in the past and  
8        believes that it should continue to be the operative practice, but reserves  
9        the right, in highly unusual situations where adequate protection of public  
10      health and safety would be compromised if such action were not taken, to  
11      consider imposing joint and several liability on co-owners of more than de  
12      minimis shares when one or more co-owners have defaulted."

13

14      Q.     Regarding anticipated energy producing life, what is your position on the  
15      assertions on page 3 of the Campaign for Ratepayer's Rights testimony regarding  
16      "achievability" of a 36 year life?

17

18      A.     North Atlantic's position is that "achievability" of any given plant life scenario  
19      for Seabrook Station or any other plant is fundamental to the question of whether or not  
20      any assumed plant life is "likely". In addressing this question, it is completely  
21      inappropriate to pick and choose from the overall population of plants only those plants  
22      that have closed and argue that this history imposes a "likelihood" that Seabrook Station

1 will have the same or similar life cycle. It is more appropriate to evaluate any currently  
2 operating plant on its merits in order to take a position on the operating life that it is  
3 likely to achieve.

4

5 One obvious fact that can be learned from history is that the licensed life is no guarantee  
6 of the actual plant life. I agree with the Campaign for Ratepayer's Rights on this point.  
7 However, I disagree on how this point of history should be applied to insights on the  
8 future. I continue to believe that it is completely reasonable to assume that a plant that is  
9 run well and that does a good job in managing its cost can continue to operate to its  
10 licensed life and beyond.

11

12 North Atlantic has not attempted to do site specific calculations of the type presented  
13 generically by Rust and Rothwell. Any calculations of this kind would be highly  
14 complex, would involve many specific details for any given plant, and the results would  
15 still likely have a substantial degree of uncertainty. Judgment is required.  
16 "Achievability" is essential to this judgment. Using the recent history in the industry as a  
17 guide does not lead to the conclusion that the Campaign has derived. While it is true that  
18 there have been some recent plant shutdowns announced, there also has been the  
19 announcement of the application for plant life extension for five plants and the purchase  
20 of a 24 year old plant by a consortium that plans on being a major national energy  
21 supplier. Contrary to the Campaign's conclusion that this recent history argues for a 25  
22 year life for Seabrook Station, it argues that the industry is in a state of flux and that

1 operation beyond 25 years for some plants, including Seabrook Station, is not only  
2 possible, but likely.

3

4 Finally, I want to comment on the Campaign for Ratepayer's Rights citation from a 1991  
5 World Watch Institute paper asserting that the average life expectancy of nuclear power  
6 reactors is only 16 years. I have not read this paper, but I do have some information to  
7 share with the committee based upon our evaluation of information on the world's  
8 nuclear power plants published in Nuclear News in March 1996. Of the 65 plants that  
9 had been shutdown at that time, the average operating duration had been about 17.2  
10 years. I can reasonably surmise that the World Watch Institute based its assertion of life  
11 expectancy on a similar calculation in the 1991 time frame.

12

13 I do not think these kinds of averages have any particular usefulness in predicting the  
14 future. There are simply too many variables. As I have said, each plant is unique and  
15 must be evaluated on its own particular merits. The flaw in using ~~an~~ an average can be  
16 pointed out by the following. Using the commercial operating dates for the 432  
17 commercially operating nuclear plants in the world as reported in that same Nuclear  
18 News report, these plants would be projected to have operated at an average of about 17.3  
19 years as of September 1998. These plants continue to operate and add to this average.  
20 These numbers alone would refute the World Watch Institute's assertion on plant life  
21 expectancy. In fact, for the average to have any validity all of the currently operating  
22 plants in the world would have to cease operations permanently today. The ongoing

1 accumulation of successful commercial operation by these hundreds of plants around the  
2 world speaks far more forcefully and convincingly than the history for units that have  
3 shutdown. I do not think that the futures of these operating plants will be dictated by the  
4 history of those that no longer operate, but will be determined by their performance in the  
5 regions they serve.

6

7 **Q. What are your comments on page 5 of the Campaign for Ratepayer's Rights**  
8 **testimony concerning Seabrook Station's thermal efficiency versus Combined Cycle**  
9 **Gas Turbine plants?**

10

11 A. This testimony implies that Seabrook Station's competition is, or will be,  
12 dominated by high efficiency Combined Cycle Gas Turbine plants and other emerging  
13 plant types such as microturbines. Clearly that is not the case today because few such  
14 high efficiency plants have been built. The extent to which such plants will be built in  
15 the future will depend primarily upon the availability and price for natural gas to fire  
16 these plants and how the cost of the operation (including capital costs) compares to the  
17 regional clearing price for power. Gas fired plants in sizes and numbers that will impact  
18 the regional marketplace, will impact the demand for and, therefore, could impact the  
19 price of gas. It remains to be seen how this factor will impact the relative cost of these  
20 plants versus lower efficiency plants such as Seabrook Station as well as the substantial  
21 existing installed capacity of lower efficiency fossil fueled conventional power plants in  
22 the region. Typically, the low thermal efficiency of a nuclear plant is offset by its

1 significantly lower fuel cost such that its overall production cost is competitive with  
2 conventional coal fired plants and cheaper than conventional oil or gas fired plants, both  
3 of which typically have higher thermal efficiencies. Even with a very high thermal  
4 efficiency, the fuel cost for a Combined Cycle Gas Turbine plant is high compared to  
5 nuclear. Nuclear plants continued to have this inherent advantage.

6

7 As for microturbines, this technology is targeted at the distributed generation market, not  
8 the centralized base-load power plant. The effect of such distributed small generation  
9 sources on the regional electrical power marketplace remains very uncertain.

10

11 Q. Do you have any comments on the assertion by the Campaign for  
12 Ratepayer's Rights on page 5 and 6 of their testimony that a gradual loss of industry  
13 infrastructure will tend to cause the early closure of nuclear power plants?

14

15 A. Yes. As I stated in my rebuttal of this same position by New England Power  
16 Company, this position overlooks the impact of emerging new nuclear plant designs, the  
17 international market, the need to meet greenhouse gas reduction quotas as well as the  
18 impact of plant life extension. Although it may well be true that some parts and services  
19 may be more difficult and expensive to obtain than was anticipated twenty-five years ago,  
20 North Atlantic does not believe that this will be a significant factor in determining the end  
21 of Seabrook Station's useful economic life.

22

1 Q. What is your position on the Campaign for Ratepayer's Rights  
2 characterization on page 6 of its testimony concerning "declining performance" and  
3 cost cutting at Seabrook Station?

4

5 A. The Campaign for Ratepayer's Rights claims, without basis, that the findings in  
6 NRC Inspection Report 97-08, issued April 1, 1998, that resulted in a Severity Level III  
7 violation are an indication that Seabrook Station is facing tension between the demand to  
8 cut costs and need for expensive repairs and maintenance. This characterization is  
9 misleading and incorrect. The Campaign for Ratepayer's Rights is also incorrect in its  
10 assertion that the NRC imposed, then withdrew, a fine of \$55,000.

11

12 Inspection Report 97-08 identified four instances for which North Atlantic did not  
13 promptly identify and/or correct conditions adverse to quality at Seabrook Station. More  
14 specifically, the report concluded that these instances indicated a decline in North  
15 Atlantic's performance with respect to the analysis of root causes of problems, as well as  
16 the timeliness of implementation of appropriate corrective actions. There were no  
17 indications that the NRC had any concerns that the identified performance issues were in  
18 any way related to cost cutting or that the corrective actions were not implemented in a  
19 timely manner due to cost concerns

20

21 NRC violations are classified from Level I (most severe) to Level IV (least severe). After  
22 review, one instance was not considered a violation, and the others were combined into a

1 single Level III violation. North Atlantic acknowledged the performance problem and  
2 took prompt corrective action upon its identification. In the letter that issued the Notice  
3 of Violation the NRC noted that Seabrook Station had not been the subject of escalated  
4 enforcement actions within the past two years and noted that North Atlantic's corrective  
5 actions in response to the violation had been prompt and comprehensive. As a result of  
6 these positive factors, the NRC did *not* impose a \$55,000 fine, the base civil penalty for  
7 such a violation.

8

9 The Campaign for Ratepayer's Rights also claims that North Atlantic's recent request to  
10 the NRC to extend the period for refueling is an indication of a desire to postpone  
11 maintenance to improve Seabrook's economics. This is simply not the case, and the  
12 Campaign for Ratepayer's Rights has completely mischaracterized the situation on  
13 refueling periods.

14

15 The need for this request arose out of a change in the overall operating cycle length. This  
16 period was initially about one year for the first operating cycle and then was increased to  
17 about a year and a half.

18

19 A few years ago North Atlantic evaluated the advantages and disadvantages of extending  
20 the overall cycle length to about two years and began slowly increasing cycle length  
21 toward that goal. The results of these evaluations indicated that cost savings could be  
22 achieved without compromising plant safety or performance by extending the operating

1 run length to about twenty-two months (a 24 month cycle). Before we reached the 24  
2 month cycle length, additional experience gained with the longer cycle length at  
3 Seabrook Station and at other plants with Westinghouse fuel designs provided indications  
4 that the cycle lengths should be reduced to about eighteen months.

5

6 The current operating run for Seabrook Station was planned to last nearly 20 months. For  
7 this operating cycle length we would have been able to perform all the surveillances  
8 requiring a shutdown under our current technical specifications. However, there were  
9 two forced outages this cycle, which, unless changes to the testing frequency were made,  
10 would require shutdown of the plant before the fuel was consumed as planned in order to  
11 perform those surveillances which can be conducted only when the plant is shut down for  
12 refueling. If we were to shut down to perform the surveillances, it would mean incurring  
13 additional fuel costs for customers. North Atlantic evaluated the frequency of the  
14 surveillances that would be coming due before the complete burnup the fuel and  
15 concluded that it would be acceptable to change the frequency to once every 24 months  
16 if the NRC approved this change. Similar changes in surveillance frequency have been  
17 granted to a number of other nuclear plants.

18

19 North Atlantic has no current plans to implement .twenty-four- month operating cycles,  
20 but has requested a permanent change to the surveillance intervals between refueling  
21 outages in order to have some margin for testing in the event of unforeseen extensions in  
22 the nominal eighteen- month operating cycle.

1

2     Certainly, North Atlantic, the NRC and the entire nuclear industry are aware of the  
3     performance problems at Millstone Station. It is precisely because of these problems that  
4     there is substantial monitoring of our performance by ourselves, our owners, the Public  
5     Utilities Commission, INPO, and the NRC. Keep in mind that there are a number of  
6     utilities that have been successful in reducing their costs while maintaining high  
7     performance. Mr. Backus' testimony attempts to lead one to the conclusion that cost  
8     cutting and declining performance go hand in hand. This is not necessarily true. In fact,  
9     the top safety performers in our industry very often are also the plants that have very low  
10   operating costs. We will continue to look for ways to improve our cost competitiveness.  
11   We owe that to our customers. However, we will only seek cost savings while  
12   maintaining our priorities of safe and reliable energy.

13

14   Q.    **What are your comments on pages 6 and 7 of the Campaign for Ratepayer's  
15   Rights testimony regarding Great Bay Power Company's advocacy of accelerated  
16   funding?**

17

18   A.    Great Bay Power Company has not been an advocate of accelerated funding, but  
19   has agreed to accelerated funding as a basis for a request to the NRC that this accelerated  
20   funding constituted acceptable financial assurance for compliance to the regulations, or,  
21   alternatively, that a permanent exemption from the requirements was warranted.  
22   Subsequent to Great Bay Power's request to the NRC, New Hampshire Bill SB140

1      became law. On the basis of the SB140 provisions for the other owners to guarantee  
2      Great Bay Power's decommissioning funding obligations, the NRC took the position that  
3      Great Bay Power was in compliance with the funding assurance requirements and did not  
4      act on Great Bay Power's earlier request regarding accelerated funding.

5

6      Q.     **On page 7 of their testimony the Campaign for Ratepayer's Rights asserts**  
7      **that the Unit 2 steam generators were sold to bolster Northeast Utilities cash flow.**  
8      **Do you agree with this assertion?**

9

10     A.    I do not. First of all, Northeast Utilities placed their portion of the proceeds from  
11    the sale of the Unit 2 steam generators into an escrow account earmarked for future use in  
12    dismantling Unit 2. Obviously, this action did nothing to bolster their cash flow. Second,  
13    the determination to sell the steam generators was made by all of the Joint Owners, not  
14    just Northeast Utilities, and was based upon an assessment of the market value, the  
15    potential value in the future, and the cost effectiveness of using these steam generators in  
16    the future.

17

18     Q.    **Has the sale of the Unit 2 steam generators materially increased the**  
19    **vulnerability of Seabrook Station to early shutdown due to steam generator**  
20    **problems?**

21

1 No. The Campaign for Ratepayer's rights also asserts that the lack of these steam  
2 generators is an indication of Seabrook Station's vulnerability to early shutdown in the  
3 event that the Unit 1 steam generators degrade and must be replaced. The Campaign for  
4 Ratepayer's Rights also asserts in their testimony that North Atlantic, in a prior  
5 proceeding before the committee, cited the availability of the Unit 2 steam generators as  
6 providing additional assurance for a 36 year plant life. I disagree with the first assertion  
7 and the second assertion is misleading and requires clarification.

8

9 First, the sale of the Unit 2 steam generators does not materially increase the vulnerability  
10 to early shutdown. Putting aside the question of whether the Unit 2 steam generators  
11 would be appropriate to use based on the postulated failure mechanism, the cost of the  
12 steam generators themselves is only a small fraction of the total cost for the job of  
13 replacing steam generators. Based upon reported costs for steam generator replacements  
14 in this country through 1996, the projected cost to replace steam generators is likely to be  
15 in the \$175-to-\$230 million range in current dollars of which about \$80 million is a  
16 reasonable estimate for the cost of replacement steam generators. We estimated that the  
17 cost to extract the steam generators from Unit 2 where they were installed and to upgrade  
18 these steam generators for use would require several million of this amount, perhaps \$15-  
19 to-\$20 million in the event the steam generators had to be shipped offsite for  
20 refurbishment or alterations. This means that the difference between the cost of using new  
21 steam generators versus upgrading and using the Unit 2 steam generators is about \$60-to-  
22 \$65 million, only about a quarter to a third of the total project cost. It is unlikely that this

1 amount would drive the decision to shut down the station prematurely. The total cost of a  
2 steam generator replacement project would be the deciding factor. This information as  
3 well as questions about whether or not it would make good business sense in the future  
4 to use old technology as a replacement convinced the owners that it was appropriate to  
5 sell the Unit 2 steam generators.

6

7 Concerning the positions taken in previous proceedings, the company did state in Docket  
8 93-1 that the Unit 2 steam generators would be available in the unlikely event that the  
9 Unit 1 steam generators required replacement. This was a simple fact at the time. The  
10 company also indicated that the Unit 2 steam generators were for sale. The company did  
11 not make any representations that the Unit 2 steam generators were needed in order to  
12 achieve full licensed plant life.

13

14 Q. Do you have any comments on the Campaign for Ratepayer's Rights  
15 testimony on pages 7 and 8 concerning the Model F steam generator?

16

17 A. Yes. First, Mr. Backus quotes Mr. Abbot of ABZ as saying that the reason why  
18 Seabrook has a Model F is because Models A through E have not succeeded. This  
19 testimony implies that the Model F will have the same performance as its predecessors.  
20 There is no basis for such a conclusion. The facts are that the Model F design is proving  
21 itself to have a significantly lower susceptibility to the types of tube degradation

1 mechanisms exhibited by earlier Westinghouse steam generator design models, indicating  
2 that the Model F improvements have been effective.

3

4 A comprehensive comparison of performance of the various Westinghouse steam  
5 generator models would be a major undertaking because the large number of models  
6 (BWI, CRF-80, D2, D3, D4, D5, D75, E, F, 13, 27, 33, 44, 44F, 51, 51F, 51M) installed  
7 domestically and in other countries, the number of variations within a given model (e.g.,  
8 the tube material, the specific configuration and materials in the various steam plants, and  
9 the secondary plant chemistry programs), and the specific tube degradation mechanisms  
10 at any given plant. The total number of tubes plugged gives a gross indication of relative  
11 performance. Data available from EPRI (December 1996 data) indicates the following  
12 plugging levels for plants with Westinghouse Model F designs and thermally treated  
13 alloy 600 tubes.

Plant	Year of Com.Oper.	# of tubes plugged	% of total
Millstone 3	1986	39	0.17% (22,504 tubes)
Seabrook	1990	36	0.16% (22,504 tubes)
Vogtle 1	1987	31	0.14% (22,504 tubes)
Vogtle 2	1989	24	0.11% (22,504 tubes)
Wolf Creek	1985	93	0.41% (22,504 tubes)
Kori 2 (Korea)	1983	253	2.25% (11252 tubes)
Kori 3 (Korea)	1985	48	0.28% (16878 tubes)
Kori 4 (Korea)	1986	60	0.35% (16878 tubes)

Yongwang 1 (Korea)	1986	67	0.40% (16878 tubes)
Yongwang 2 (Korea)	1987	70	0.41% (16878 tubes)
Vandellos 2 (Spain)	1987	237	1.40% (16878 tubes)

1

2 The different number of total tubes for various plants is because there are two, three, and  
 3 four loop plants represented. In our response to a data request from the Seacoast Anti-  
 4 Pollution League we did not identify Kori 3&4, Yongwang 1&2, or Vandellos 2 as  
 5 having Model F steam generators with Inconel-600 thermally treated tubes. In the  
 6 preparation of this testimony North Atlantic found these additional foreign plants that  
 7 should have been included in the list of such plants.

8

9 The plugging data in the above table indicates very modest tube damage from all sources.  
 10 With the exception of the Kori Unit 2 steam generators, nearly all of the plugging has  
 11 resulted from tube wear from anti-vibration bars (AVB). Kori Unit 2 plugged tubes due  
 12 to AVB wear, but also had problems with damage due to secondary side stress corrosion  
 13 and/or intergranular attack at the tube sheet. Although there is no official documentation  
 14 on this matter, North Atlantic has received informal information from Westinghouse  
 15 which indicates that the Kori Unit 2 tube problem at the tubesheet locations may have  
 16 resulted from the inadvertent introduction of carbon steel balls into the steam generators  
 17 as a result of some repair work in the steam plant. None of the other plants with Model F  
 18 steam generators and I-600TT tubes has experienced this kind of damage.

19

1 To put the small amount of tube damage that has occurred in steam generators like  
2 Seabrook Station's into perspective it is informative to look at the data for some selected  
3 steam generators that have been replaced.

4

5 Catawba Unit 1 replaced its Westinghouse Model D-3 steam generators in 1996. The  
6 steam generators had been in service from 1985-1996 and exhibited damage early (62  
7 tubes plugged in 1988 after only 2 effective full power years of operation, 182 in 1990,  
8 230 in 1991, 252 in 1992). The damage continued. When these steam generators were  
9 replaced, about 1900 tubes had been plugged.

10

11 D.C. Cook Unit 2 replaced its Westinghouse Model 51 steam generators in 1988. The  
12 steam generators had been in service since 1977 and also exhibited significant tube  
13 damage early (402 tubes plugged in 1984 after 4 effective full power years of operation,  
14 147 more in 1985, 151 more in 1986). By the time of replacement, about 950 tubes had  
15 been plugged.

16

17 Turkey Point Unit 3 replaced its Westinghouse Model 44 steam generators in 1982  
18 following service since 1973. Again, extensive tube damage was exhibited early (275  
19 tubes plugged in 1976 after 3 effective full power years of operation, 604 more in 1977,  
20 730 more in 1979). By the time of replacement, about 1985 tubes had been plugged.  
21 Turkey Point Unit 4 which replaced its Model 44 steam generators in 1983 had a very  
22 similar history.

1

2 All of these replaced steam generators had Inconel 600 mill annealed tubes (I-600MA).  
3 The replacement steam generators have Inconel 600 thermally treated tubes (I-600TT),  
4 the same material used in the Seabrook Station steam generator tubes. To give an  
5 indication of the performance of this material, as of the end of 1996, after 8 years of  
6 operation, D.C. Cook Unit 2 had plugged 9 tubes in its replacement steam generators.  
7 This was done in 1994. After 14 years of operation, Turkey Point 3 has plugged 68  
8 tubes, 39 of which were reported for the first year data which typically indicates pre-  
9 operational preventative plugging rather than damage from operations. After 15 years of  
10 operation, Turkey Point 4 has plugged 33 tubes, 31 of which were reported in the first  
11 year data (again, this is typically preventative plugging), and the remaining 2 during  
12 subsequent operations. Catawba Unit 1 has plugged 19 tubes, all reported for the first  
13 year of operation (preventative plugging) and no data for the operational period has been  
14 reported to date.

15

16 According to EPRI data, in 1996, 10,551 tubes were plugged world-wide in the 226  
17 plants reporting data to EPRI. That works out to nearly 47 tubes per year. As indicated  
18 in the table presented earlier, as of the end of 1996, Seabrook Station had not plugged  
19 that number in total since it entered operation in 1990, and the Seabrook Station total  
20 includes 13 that were plugged for preventive reasons before the plant began operations.  
21 Moreover, Seabrook Station has not seen the major tube degradation mechanisms--  
22 wastage, pitting, denting, cracking--that have been the primary causes for the large

1 number of steam generator replacements in the industry. To date, Seabrook Station's  
2 steam generators have only been susceptible to fretting wear at anti-vibration bar  
3 locations.

4

5 Based upon the experience in the industry, sufficient operating history has been  
6 accumulated so that the types of major tube degradation experienced by many plants  
7 would have begun to manifest themselves by now. It appears more likely that the Model  
8 F design with thermally treated Inconel 600 tubes and a good chemistry program are  
9 effective in controlling the major tube degradation mechanisms. We will have to watch  
10 the steam generator performance carefully, but the performance to date is quite promising  
11 compared to the performance of earlier generation steam generator designs.

12

13 Regarding the time that major steam generator problems might be expected to manifest  
14 themselves, I have already discussed some history for some typical steam generators that  
15 had to be replaced. It is also useful to consider the plugging history for the seven plants  
16 with Westinghouse steam generator designs that are among the list of all plants which the  
17 EPRI data identifies as having much higher than average tube plugging rates. These  
18 plants have plugged thousands of tubes. Three of the seven plants required plugging of  
19 significant numbers of tubes after 2-to-3 effective full power years of operation, another  
20 after 5 effective full power years, two after 7 effective full power years, and one after 9  
21 effective full power years. None of these plants had the steam generator design  
22 improvements or improved tube material of the Seabrook Station steam generator design.

1    Although we cannot categorically rule such problems at Seabrook Station in the future,  
2    the experience with the older designs, including the replaced steam generators, and the  
3    favorable performance data for Model F steam generators with thermally treated Inconel  
4    600 tubes gives us good reason to believe that major tube problems for Seabrook  
5    Station's steam generators would most likely have manifested themselves by now. As of  
6    the last refueling outage in 1997 when the steam generator tubes were last inspected,  
7    Seabrook Station had accumulated nearly 6 effective full power years of operation.

8

9    In their testimony the Campaign for Ratepayer's Rights has asserted, based upon their  
10   interpretation of the NRC's Inspection Report 97-03 on Seabrook Station, that the NRC  
11   does not agree with the stated position by Mr. DeLoach in the last proceeding concerning  
12   the operational time needed for AVB wear to manifest itself. Mr. DeLoach testified, if I  
13   can paraphrase, that if AVB wear had not yet manifested itself on a tube, it was unlikely  
14   to do so. In the Inspection Report the NRC, in noting that the number of tubes requiring  
15   plugs has been low, stated that most steam generator degradation problems have been  
16   found only after longer periods of time. The NRC's comment was not specifically  
17   targeted at AVB wear. The comment was made in relation to the overall plugging  
18   experience at Seabrook Station which the NRC noted was low, but the NRC also noted  
19   that most steam generator degradation problems have been found only after longer  
20   periods of operation. We believe that the NRC statement was generic in nature and not  
21   specifically targeted at any particular steam generator design. There is a great deal of  
22   evidence for the Westinghouse steam generator designs to indicate that, if there are going

1 to be major tube damage problems, they will begin to manifest themselves within the  
2 time frame of Seabrook Station's current operating history.

3

4 In the same inspection report the NRC also pointed out that most of the tube plugging at  
5 Seabrook Station has resulted from AVB wear or as a result of manufacturing defects and  
6 that the AVB wear occurs when the AVB clearances are excessive, allowing the  
7 supposedly restrained tubes to move in a vibratory manner when acted upon by the flow  
8 stream (fluids circulating within the steam generator during normal operation). Mr.  
9 DeLoach's earlier testimony was making the point that for a given steam generator, the  
10 excessive clearances that contribute to AVB wear result from the manufacturing process,  
11 not the operation of the steam generator. To the extent that the excess clearances are  
12 present, AVB wear manifests itself shortly after operation. If the excessive clearances are  
13 not present, they will not develop over time as the steam generator operates. Thus, it is  
14 unlikely that AVB wear will appear at locations where this mechanism has not already  
15 manifested itself.

16

17 The Campaign for Ratepayer's rights implies in its testimony regarding the Kori plant  
18 that, because of the Kori plant is older than the other plants with Model F steam  
19 generators and has more tube damage, the other plants will experience similar damage as  
20 they become older. Kori Unit 2 plugged 123 tubes due to secondary side stress corrosion  
21 cracking and/or intergranular attack at tubesheet locations after only 3 effective full  
22 power years of operation and has seen a few more cases of this problem since that time.

1 Kori Unit 2 also plugged a single tube as a result of primary side stress corrosion cracking  
2 at a tubesheet location in 1994 after 9 effective full power years of operation. Nearly all  
3 of the remainder of the damage in this unit is from AVB wear. Seabrook Station has not  
4 experienced any degradation due to intergranular attack and is well beyond the time when  
5 this problem was found in Kori Unit 2. This type of attack has not been seen at Seabrook  
6 Station or Vogtle Unit 2, both with about 6 effective full power years of operation, or at  
7 Millstone Unit 3, Vogtle Unit 1, or Wolf Creek; with 7, 8, and 9 effective power years of  
8 operation, respectively. We do not know for certain why Kori Unit 2 had this experience.  
9 As I mentioned earlier, we have informal information from Westinghouse indicating that  
10 the problem may have been caused by inadvertent introduction of carbon steel material  
11 into the steam generator secondary side which accumulated on the tubesheet and caused  
12 the tube damage. We do know that Kori Unit 2 has only plugged about 8 tubes due to  
13 these problems in the seven effective full power years of operation since the initial 123  
14 tubes with this type of problem were found. They appear to have this problem under  
15 control. The preponderance of evidence for the Model F steam generators with thermally  
16 treated Inconel 600 tubes indicates that this type of attack is not a problem.

17

18 Q. Do you have any comments on the Campaign for Ratepayer's Rights  
19 characterization of your direct testimony concerning the overstatement of low level  
20 waste disposal cost escalation (page 10)?

21

1 A. Yes. My direct testimony did not, as asserted by the Campaign for Ratepayer's  
2 Rights, argue that the cost escalation for low level waste disposal is overstated because of  
3 competition between the two existing low level waste disposal sites at Barnwell, S.C. and  
4 Envirocare in Utah. What I did argue was that the NRC minimum decommissioning cost  
5 value is overly conservative in that it places too much weight on the cost escalation for  
6 LLRW disposal. I also argued that the NRC methodology does not allow Seabrook  
7 Station to include available cost savings from Envirocare versus Barnwell and does not  
8 allow Seabrook Station to apply the site-specific breakdown of LLRW as a percentage of  
9 the total site specific cost estimate. The available savings from Envirocare versus  
10 Barnwell are not speculative as the Campaign for Ratepayer's Rights has suggested. Ou-  
11 stated position has nothing to do with the situation at any other disposal facilities that  
12 may or may not be available to us. The savings are available today through Envirocare,  
13 and there is no reason to believe these same savings will be unavailable in the future. In  
14 fact, we anticipate that our use of Envirocare will expand in coming years.

15

16 Further, the portion of the total cost estimate attributable to low level waste disposal is  
17 substantially less than the NRC calculated amount since the NRC methodology did not  
18 consider current waste volume reduction methodology and recycle of metallic waste.

19

20 The NRC recognizes that there are shortcomings in its methodology. In October 1997 the  
21 NRC staff requested approval of the NRC commissioners to publish proposed rulemaking  
22 that would allow licensees to use site-specific decommissioning costs whether these

1 estimates be higher or lower than the value in the current NRC methodology. In February  
2 of this year the commissioners disapproved this recommendation. The NRC chairman  
3 encouraged the staff to continue to explore the use of site-specific cost estimates, but also  
4 requested that they continue to evaluate appropriate changes to the NRC methodology.  
5 The NRC position continues to evolve, but it is clear that the NRC itself recognizes that  
6 site-specific estimates can be significantly lower than indicated by the NRC methodology  
7 as a result of factors such as the assumed LLRW escalation factor. These issues are likely  
8 to be resolved by either changes to the NRC generic methodology, rulemaking to allow  
9 the use of site-specific estimates, or expanded use of the NRC's exemption process.

10

11 Q. Do you have any comments regarding the Campaign for Ratepayer's Rights  
12 assertions regarding the relative decommissioning cost estimates for Seabrook  
13 Station, Maine Yankee, Connecticut Yankee, and Millstone Unit 1?

14

15 A. Yes. First, I want to point out that the relative size of the plants in megawatts is a  
16 factor in the decommissioning cost, but only a portion of the cost has a direct relationship  
17 to the plant size. The NRC's generic formula for minimum decommissioning costs  
18 recognizes this relationship. The NRC formula also recognizes the higher  
19 decommissioning cost for a Boiling Water Reactor (BWR) versus a Pressurized Water  
20 Reactor (PWR). Using the NRC's generic formula for Seabrook Station, Connecticut  
21 Yankee, Maine Yankee, and Millstone Unit 1 the relative magnitudes for the cost

1 estimates would be 1.0, 0.88, 0.94, and 1.16, respectively (but the corresponding ratios by  
2 megawatts (thermal) is 1.0, 0.53, 0.79, and 0.59, respectively).

3

4 Although many of the decommissioning costs are driven by the relative size of the  
5 nuclear portion of the plant, there are other significant factors that come into play.

6 Comparisons must be done very carefully with appropriate consideration for all of the  
7 various differences that drive the costs.

8

9 In the case of Maine Yankee, a clear difference in the estimates is the premature  
10 shutdown at Maine Yankee which significantly impacts the cost for storage of spent fuel  
11 during the period from shutdown until the fuel can be shipped to a DOE disposal facility.

12 This accounts for about \$128 million of the Maine Yankee estimate of \$508 million  
13 (1997 dollars). Since Seabrook Station's estimate assumes a planned shutdown at the end  
14 of licensed life, these storage costs are much lower, about \$63 million in 1997 dollars. If  
15 these differences are accounted for, the MY estimate would be about 98% of the  
16 Seabrook estimate, close to the 94% value suggested by the generic NRC formula.

17

18 In the case of Connecticut Yankee, the \$426.7 million estimate is in 1996 dollars which is  
19 about \$470 million in 1998 dollars. This total includes about \$110 million for ongoing  
20 wet storage of spent fuel versus the approximately \$66 million (1998 dollars) in the  
21 Seabrook estimate for dry storage of spent fuel. When these differences are accounted  
22 for, the Connecticut Yankee estimate is about 81% of the Seabrook Station estimate. The

1 generic NRC formula would suggest that the Seabrook estimate is high compared to the  
2 estimate for Connecticut Yankee.

3

4 In the case of Millstone Unit 1, Northeast Utilities filed three decommissioning cost  
5 scenarios with the State of Connecticut, only one of which can be compared more or less  
6 directly to the Seabrook Station scenario. The first option is prompt decommissioning at  
7 the end of life, or DECON, and has a cost estimate of about \$506 million in 1998 dollars.

8 The second option, called Station Dismantlement, assumes that Unit 1 will be dismantled  
9 after a ten year dormancy period. The cost estimate for this option is about \$560 million  
10 in 1998 dollars. The third option, called Station Entomb, assumes a 53 year dormancy  
11 period for Unit 1. The cost estimate for this option is about \$630 million in 1998 dollars.

12 Only the first of these options, DECON, can be compared to the Seabrook Station  
13 estimate of \$489 million. In comparing the Seabrook Station versus Millstone Unit 1

14 DECON estimates the first obvious difference is that Millstone Unit 1 is a Boiling Water  
15 Reactor (BWR), not a Pressurized Water Reactor (PWR) as is the case for Seabrook

16 Station. All other factors being the same, a BWR typically has a higher decommissioning  
17 cost because the turbines and the remainder of the steam plant are radioactively

18 contaminated in these designs. The NRC minimum calculation in 10 CFR 50.75  
19 recognizes this difference, and for the same size PWRs and BWRs the minimum

20 decommissioning cost is about 28% higher for a BWR. If Seabrook Station was a BWR  
21 like Millstone Unit 1 and of the same magawatt size as Millstone Unit 1, the NRC

22 formula would suggest that the Seabrook decommissioning cost would be about \$550

1 million versus the Millstone Unit 1 value of about \$506 million. Aside from the BWR  
2 versus PWR factor, there are other significant differences that make the two estimates  
3 difficult to compare. For one thing, Millstone Unit 1 does not assume that dry storage of  
4 spent fuel will be required. The assumption is that spent fuel from Unit 1 can be stored in  
5 the spent fuel pool of Unit 2 or Unit 3 after the Unit 1 spent fuel pool is decommissioned.  
6 Another significant factor is that Unit 1 is part of a multi-unit site which adds some  
7 additional uncertainty to the portions of the site decommissioning costs that are allocated  
8 to any given unit. Given the BWR versus PWR factor and size factor, however, it appears  
9 that the Millstone Unit 1 and Seabrook estimates are reasonable when compared to one  
10 another. If anything, the Seabrook estimate is a bit higher relative to Millstone Unit 1  
11 than the generic NRC formula would suggest.

12

13 Q. Has the Campaign for Ratepayer's Rights correctly stated North Atlantic's  
14 position regarding intergenerational equity?

15

16 A. They have not. The testimony states that intergenerational equity is the name  
17 North Atlantic has given to the situation that would exist if the decommissioning fund  
18 turned out to be too large, so that the current generation of ratepayers would end up  
19 paying more than their fair share, and the generation of future ratepayers would be in  
20 effect subsidized. Aside from the fact that the testimony appears to be characterizing  
21 intergenerational *inequity* rather than intergenerational *equity*, the testimony has never  
22 been our position. North Atlantic's definition does not address the question of

1 overfunding. Our position is that present customers who receive the benefits of Seabrook  
2 Station's power should contribute to the decommissioning fund in the same proportion as  
3 future customers who receive the benefit of the power in the future.

4

5 Q. Do you agree with the Campaign for Ratepayer's Rights assertion that no  
6 Seabrook Station decommissioning cost estimate has ever been overstated and that  
7 it is unlikely that the ultimate decommissioning will be accomplished for \$489  
8 million?

9

10 A. I do not. Until this year the Seabrook Station decommissioning cost estimate has  
11 consistently exceeded the NRC minimum value which is based upon a generic formula in  
12 10 CFR 50.75. As we have stated in our direct testimony, North Atlantic believes that the  
13 NRC generic formula leads to overly conservative values of cost escalation because the  
14 low level radioactive waste portion is overstated for the reasons that I discussed in my  
15 earlier testimony on this subject. In spite of this conservatism, the site-specific Seabrook  
16 Station estimate in 1998 is still about 97% of the NRC specified minimum value, and we  
17 have proposed funding to the NRC minimum value even though we and TLG believe that  
18 we can complete the decommissioning within the site-specific estimate.

19

20 Among the conclusions of the committee's consultant, Team Associates, based upon their  
21 review of the previous Seabrook Station cost estimate, was that the estimate: "...tends  
22 to be somewhat conservative, does not reflect relative risk in a consistent manner, and

1 attempts to cover all eventualities." Team Associates also concluded that the escalation  
2 rate applied to low level radioactive waste is: "...unrealistically high and does not  
3 consider the benefits of emerging technology and market competition." The current  
4 estimate has continued to apply the same general methodology as the previous study. We  
5 would agree with Team Associates characterization and believe that the current estimate  
6 is also somewhat conservative.

7

8 I have already commented on the reasons why the Campaign for Ratepayer's Rights is  
9 incorrect in its assertions about the relative magnitudes of the Seabrook Station estimate  
10 versus Maine Yankee, Connecticut Yankee, and Millstone Unit 1. The Campaign for  
11 Ratepayer's Rights implies the Seabrook Station estimate is too low, in part, because of  
12 the costs for high level and low level radioactive waste disposal, including the cost for  
13 dry storage of spent fuel. North Atlantic believes that the Seabrook Station cost estimate,  
14 including the special contingencies and the assumptions on dry storage of spent fuel, is  
15 reasonable and conservative. The low level radioactive waste situation is not  
16 "intractable" as the Campaign for Ratepayer's Rights asserts. Although it is true that  
17 little progress has been made to date on regional compacts, the facts are that two disposal  
18 sites are available to us today and we have good reason to believe that this will be the  
19 case for many years to come. To the extent that other sites become available, such new  
20 sites can only help by introducing more competition for the disposal dollar.

21

1 Progress is being made in the area of high level waste disposal. Although the DOE failed  
2 to meet its obligations and this has impacted our current cost estimate, we believe that our  
3 estimate is based upon achievable dates. We have prudently included a special  
4 contingency to cover additional slippage in the DOE acceptance schedule. Regarding dry  
5 cask storage, there have been some problems in the industry as cited by the Campaign for  
6 Ratepayer's Rights, but these problems are all readily solvable and certainly not  
7 "intractable" as the testimony implies. The cited problems included welding problems  
8 and fabrication problems for storage casks at Wisconsin Electric's Point Beach nuclear  
9 station. In a press release of August 14, 1998, the NRC announced that its concerns had  
10 been resolved and lifted its restrictions on the loading of spent fuel casks at Point Beach.

11 I mention this as evidence that the cited problems are not "show stoppers" and that dry  
12 cask storage is a proven technology that is generally being implemented around the  
13 country without major problems. In fact, dry cask storage is now being used at 10  
14 nuclear plant sites around the country, and another 17 or so are expected to begin using  
15 dry cask storage near-term.

16

17 On the other hand, North Atlantic cannot guarantee that there will be no problems with  
18 dry storage units that we anticipate using in the future. For this reason our  
19 decommissioning cost estimate includes a site transfer system as part of the planned dry  
20 storage facility. The transfer system will allow us to unload a canister that might  
21 experience a problem and to reload the spent fuel into another fully functional storage

1 canister. This is another example of a prudent and conservative cost included in our  
2 estimate.

3

4 Q. Do you have any comments on the Campaign for Ratepayer's Rights  
5 suggestions (page 13 of their testimony) concerning escalation and contingency  
6 factors?

7

8 A. Yes. The current estimate retains the escalation and contingency methodology  
9 previously approved by this committee and that was reviewed by the committee's  
10 consultant, Team Associates. We continue to believe that this approach is reasonable and  
11 somewhat conservative. Team Associates concluded that we had taken a conservative  
12 and higher cost approach by attempting to cover all eventualities. Among other things  
13 Team Associates recommended that we assure that total estimated costs are as aggressive  
14 as possible (less conservatism), that cost estimates be on the low side, and that a much  
15 more aggressive posture (a lower rate) be reflected for the low level radioactive waste  
16 cost escalation. We agree with Team Associates that our approach has been conservative.  
17 However, we are not advocating a change in escalation methodology at this point in time.

18

19 The Campaign for Ratepayer's Rights also asserts that North Atlantic has cited a decline  
20 in the cost of disposing of low level radioactive waste as causing a change in the trend of  
21 increasing costs. This is simply incorrect. In fact, North Atlantic predicted a 10.8% cost  
22 *escalation* factor for low level radioactive waste disposal based upon historical cost

1 trends. As I have pointed out earlier, Team Associates concluded that this rate was  
2 unrealistically *high*. Although we are hopeful that factors such as increased use of  
3 Envirocare, additional disposal sites, or other factors will eventually reduce this assumed  
4 cost escalation, none of these factors have been incorporated in our cost estimate, and we  
5 have not and would not advocate doing otherwise at this point in time.

6

7 Q. Do you have position on the Campaign for Ratepayer's Rights assertions  
8 regarding DECON, SAFSTOR, and ENTOMB?

9

10 A. Yes. North Atlantic has supported the prompt decontamination and  
11 dismantlement option (DECON) not only because of the cost advantages, but because we  
12 believe any other option adds considerable uncertainty on the availability of staff and  
13 resources to safely and efficiently decommission the plant. SAFSTOR and ENTOMB do  
14 not avoid decontamination and dismantlement. They only delay it. SAFSTOR has been  
15 the approach for many plants that have shut down prematurely and/or for multi-unit sites  
16 for which another unit continues to operate. We believe that DECON is the only option  
17 that makes sense when there is sufficient time to plan it. Certainly Seabrook Station has  
18 ample time to plan for an orderly and prompt decommissioning. We do not share the  
19 Campaign for Ratepayer's Rights pessimistic view that future events could preclude  
20 prompt dismantlement. We also disagree with the assertion that SAFSTOR and  
21 ENTOMB could be the only viable options in the unlikely event that a long term disposal  
22 facility for spent fuel is unavailable when the plant has been permanently shut down. The

1 facts are that the fuel must be removed from the reactor vessel regardless of which  
2 decommissioning option is selected. The decommissioning alternatives address the  
3 methodology to deal with the balance of the facility once the nuclear fuel has been  
4 removed from the reactor. Viable options using proven technology would include prompt  
5 dismantlement in conjunction with an Independent Spent Fuel Storage Facility.

6

7 I would also like to comment on the company's positions on mothballing cited in the  
8 testimony. In its Environmental Report, Revision 2, of June 1982, PSNH provided a  
9 description of several decommissioning alternatives including mothballing, entombing,  
10 prompt removal/dismantling, and combinations of these. In this report PSNH stated that  
11 the decision as to which of the alternatives will be employed could not be made at that  
12 time and that any of the alternatives might be selected based upon the costs and benefits  
13 of each and the planned end use of the site in the future. This report also provided  
14 approximate comparative decommissioning costs (generic, not site-specific) taken from  
15 NUREG-0586, "Draft Generic Environmental Impact Statement of Decommissioning of  
16 Nuclear Facilities," January 1981. The values provided in 1978 dollars were \$33.3  
17 million, \$21.0 to \$27.0 million, and \$42.8 million for prompt dismantling, entombing,  
18 and mothballing, respectively. The report also stated that the annual costs for  
19 surveillance and security would be \$40,000 and \$2.20 million in 1997 dollars following  
20 entombing or mothballing, respectively. I want to emphasize again that these were not  
21 PSNH's site-specific cost estimates, but were generic values taken from NUREG-0586 at  
22 the time. Further, this estimate was performed six years before the NRC issued its final

1 rulemaking requiring decommissioning funding and the submittal of a decommissioning  
2 cost estimate.

3

4 Q. What is your opinion on the recommendation by the Campaign for  
5 Ratepayer's Rights that the decommissioning fund should be targeted to meet the  
6 highest cost alternative as the best policy option to meet the declared purpose of  
7 RSA 162-F?

8

9 A. RSA 162-F recognizes that a decommissioning process is needed to ensure the  
10 safety and well-being of the public and future generations and establishes a procedure to  
11 ensure that sufficient funds will be available to do so. North Atlantic and the Seabrook  
12 Station owners believe that the best means to protect the safety and well-being of the  
13 public and future generations is to promptly decontaminate and dismantle the unit as soon  
14 as practicable after the completion of its useful operating life. Although other options are  
15 allowed under existing NRC regulations, these options would allow the hazards of a  
16 defunct industrial facility to remain intact for extended periods of time with all of the  
17 attendant concerns of physical deterioration and uncertainty until such time the facility  
18 would be properly dismantled. It makes much more sense to do the job promptly and  
19 avoid these problems and uncertainties.

20

1    Q.    Do you have an opinion on the recommendation of the Campaign for  
2    Ratepayer's Rights urging the committee to recommend joint and several liability to  
3    the NRC?

4    A.    Yes. As I have stated in earlier remarks, such a recommendation is unnecessary  
5    since the NRC's published policy statement on financial assurance already indicates that  
6    the NRC considers that it may impose joint and several liability in the event that they  
7    think it is appropriate to do so.

8

9    Regarding the testimony of James R. Anderson:

10

11    Q.    To what extent does your rebuttal testimony above regarding the testimony  
12    of New England Power Company and the Campaign for Ratepayer's Rights apply  
13    to the testimony of the Office of the Consumer Advocate?

14

15    A.    New England Power Company, the Campaign for Ratepayer's Rights, and the  
16    Office of the Consumer Advocate have all relied upon industry experience to date as a  
17    basis for concluding that Seabrook Station will not achieve its full licensed life. For the  
18    reasons discussed in my earlier rebuttal testimony, I do not believe that this is  
19    appropriate. I will not repeat these arguments, but I do have additional rebuttal testimony  
20    on several related aspects of the testimony from the Office of the Consumer Advocate.

21

1    Q.    Has the Office of the Consumer Advocate correctly represented the cost for  
2    the decommissioning of Millstone Unit 1?

3

4    A.    In my earlier testimony I pointed out that cost estimates for three  
5    decommissioning scenarios for Millstone Unit 1 have been filed in the State of  
6    Connecticut. The cost for these scenarios range from about \$506 million to about \$630  
7    million in 1998 dollars. Of the three scenarios, the lowest cost alternative (the DECON  
8    option) is the only one that should be compared to the Seabrook Station estimate. Also,  
9    as I pointed out in earlier remarks, Millstone Unit 1 is a Boiling Water Reactor and has an  
10   inherently higher decommissioning cost than Seabrook Station which is a Pressurized  
11   Water Reactor. I also pointed out in earlier remarks that the relative magawatt size of the  
12   two plants is not good basis for comparing the decommissioning costs.

13

14    Q.    Do you believe the Office of the Consumer Advocate correctly characterized  
15   Great Bay Power's position on a 25 year energy producing life for Seabrook  
16   Station?

17

18    A.    In my earlier remarks I discussed this question. I am aware of no information to  
19   support the Office of the Consumer Advocate's Position. In fact, in a data request we  
20   asked for information on the source of this contention. The Office of the Consumer  
21   Advocate's response to the data request provided only information on Great Bay Power's  
22   submittals to the NRC regarding requests for exemption from the NRC's funding

1 assurance requirements as a basis for their conclusion. As I stated in my earlier remarks  
2 on this matter, I believe that Great Bay Power's actions with the NRC were solely for the  
3 purpose of resolving the compliance question to NRC requirements, and in no way  
4 indicate that Great Bay Power believes that the plant has no more than a twenty five year  
5 economic life.

6

7 **Q. What are your views on the assertions by the Office of the Consumer  
8 Advocate regarding the prognosis for the Ontario Hydro nuclear units?**

9

10 A. It appears that these positions are based on interpretations of information that we  
11 provided in data request responses to the Office of the Consumer Advocate. If so, this is  
12 not what we said and I cannot agree with the conclusions. What we said was that by June  
13 1999 Ontario Hydro management was expected to request approval from its Board of  
14 Directors to return the Pickering A units to service and that a restart decision for the  
15 Bruce A units was planned by the end of 1999. Unless the Office of the Consumer  
16 Advocate has additional information from other sources, any conclusions beyond these  
17 would be purely speculative. The Office of the Consumer Advocate also appears to have  
18 misinterpreted information that we provided regarding the extent to which tritium  
19 contamination of ground water at Pickering may have contributed to decisions regarding  
20 Pickering's future. We specifically stated in our data request response that there was no  
21 available information that would indicate the extent to which the tritium contamination  
22 issue may have contributed to the decision to shutdown these units. Again, unless the

1      Office of the Consumer Advocate has information from other sources, these conclusions  
2      are purely speculative.

3

4      **Q.      What are your views on the Office of the Consumer Advocate's stated**  
5      **concerns about radioactive contamination at Pickering and Connecticut Yankee and**  
6      **the potential for similar problems at Seabrook Station?**

7

8      No plant can categorically rule out the possibility of the occurrence of a spill or loss of  
9      control of radioactive material that could have a significant impact on the eventual  
10     decommissioning cost of the plant. However, it is important to point out that 10 CFR  
11     50.75 requires that licensees maintain records of spills or other unusual occurrences  
12     involving the spread of contamination in and around the facility, equipment, or site where  
13     any significant contamination remains after any cleanup procedures or when there is  
14     reasonable likelihood that contaminants may have spread to inaccessible areas. As part of  
15     North Atlantic's normal preparation of a comprehensive cost update, we seek any  
16     available information on any new areas of contamination that may not have been present  
17     for previous cost assessments. Any new areas of contamination would be included in the  
18     comprehensive cost update. In order to emphasize the 10 CFR 50.75 requirements in this  
19     area, North Atlantic has also established and promulgated a policy requiring that the  
20     organization periodically perform reviews to identify and document any instances of loss  
21     of control of radioactive contaminants or other hazardous materials (chemicals),  
22     including any instances of such material that may have been released off site and any

1 remediation activities that have been completed. Information on any such identified  
2 cases will be maintained in decommissioning records and incorporated into future  
3 decommissioning cost updates. Based upon our review to date, Seabrook Station has not  
4 experienced any situations such as mentioned by the Office of the Consumer Advocate.  
5 Therefore, there has been no impact on the decommissioning cost estimate for Seabrook  
6 Station.

7

8 Q. What are your views on the assertions by the Office of the Consumer  
9 Advocate concerning the sale of the Unit 2 steam generators?

10

11 A. The Office of the Consumer Advocate is incorrect in its assertion that PUC  
12 approval was required in order to sell the Unit 2 steam generators. As I stated earlier,  
13 North Atlantic indicated in NDFC 93-1 that the Unit 2 steam generators were for sale. A  
14 great deal of information regarding the sale of the steam generators has been provided to  
15 the PUC, but PUC approval for the sale was not required. Also, as I have stated in my  
16 earlier testimony, it has never been North Atlantic's position that the Unit 2 steam  
17 generators were needed to support full licensed life of Seabrook Station. Also, as I have  
18 stated in my earlier remarks, I do not believe that the relative cost difference between new  
19 replacement steam generators (if needed) and the cost to remove and upgrade Unit 2  
20 steam generators would be the deciding factor in any future decision to permanently  
21 shutdown Seabrook Station.

22

1     **Q.     Is the Office of the Consumer Advocate correct in its assertion that DECON**  
2     **is an unlikely decommissioning alternative for Seabrook Station?**

3

4     A.     I believe that the Office of the Consumer Advocate is misinformed on this point.  
5     Again, as I have pointed out in my earlier remarks, DECON is not only likely, it is the  
6     preferred approach and the only approach that makes sense for a single unit plant site that  
7     can plan for an orderly shutdown and decommissioning. Unless there are some other  
8     overriding factors, the other alternatives become unnecessary, are significantly more  
9     expensive, and involve more risks over a longer period of time. The Office of the  
10    Consumer Advocate is also incorrect in its assertion that the DECON alternative cannot  
11    be accomplished until a permanent repository for spent fuel is available. First of all, the  
12    fuel must be removed from the reactor vessel for any of the decommissioning  
13    alternatives. The alternatives involve different approaches in dealing with the  
14    contaminated portions of the plant that remain after the fuel has been removed and either  
15    shipped offsite or stored on site in wet or dry storage. Regardless of the decommissioning  
16    alternative that is selected, any spent fuel that has not been shipped to a repository, or  
17    possibly an off-site Independent Spent Fuel Storage Installation, will remain on site in an  
18    Independent Spent Fuel Storage Installation of some kind. We believe, for the reasons  
19    stated earlier, that DECON is the best available choice to deal with the balance of the  
20    plant once the spent fuel has been removed from the reactor vessel.

21

1 I also want to point out that our current cost estimate assumes that the DOE could begin  
2 to accept spent fuel from reactor sites beginning in 2007. Because uncertainty remains on  
3 this date, we believe that it is appropriate, as a special contingency, to assume that this  
4 date could be delayed an additional 5 years. As we have indicated in our cost estimate,  
5 2016 is the first year that spent fuel is assumed to be shipped out of Seabrook Station.

6

7 **Q. What are your views on the assertions of the Office of the Consumer  
8 Advocate regarding leveled funding?**

9

10 A. For the reasons stated earlier North Atlantic believes that Seabrook Station can  
11 achieve, and even exceed, its current licensed life and that escalating funding is the fairest  
12 approach to ensure that customers pay the same amount in real terms. We continue to  
13 believe that leveled funding imposes an undue burden on current customers.

14

15 **Q. Has the Office of the Consumer Advocate correctly characterized the  
16 financial condition of some of the Seabrook Station owners?**

17

18 A. The Office of the Consumer Advocate asserts that the financial condition of some  
19 of the Seabrook Station owners has become even more precarious since the conclusion of  
20 NDFC 93-1 and that this situation is partly due to the anticipated emergence of  
21 competition in electric generation markets. For most of the owners just the opposite is  
22 true. As a results of the anticipated competition and restructuring, actions in various

1 jurisdictions has led to guarantees of funds for decommissioning via wires charges. Great  
2 Bay Power's position relative to its funding obligations has been strengthened by virtue  
3 of the SB 140 provisions making the other owner guarantors of these obligations.  
4 Overall, the financial position regarding decommissioning funding has been strengthened,  
5 not weakened, since the conclusion of NDFC 93-1.

6

7 **Regarding the testimony of Tracy Brocks Guyette:**

8

9 Q. To what extent does your rebuttal testimony above regarding the testimony  
10 of New England Power Company, the Campaign for Ratepayer's Rights, and the  
11 Office of the Consumer Advocate apply to the testimony of the PUC staff?

12

13 A. New England Power Company, the Campaign for Ratepayer's Rights, the Office  
14 of the Consumer Advocate, and the PUC staff have all relied upon industry experience to  
15 date as a basis for concluding that Seabrook Station will not achieve its full licensed life.  
16 For the reasons discussed in my earlier rebuttal testimony, I do not believe that this is  
17 appropriate. I will not repeat these arguments, but I do have additional rebuttal testimony  
18 on several related aspects of the testimony from the PUC staff.

19

20 Q. Do you have any observations regarding the PUC staff's conclusions from  
21 the Rust and Rothwell study?

22

1    A.    There are two important conclusions that the PUC staff does not include from the  
2    Rust and Rothwell paper. First, Rust and Rothwell state that, if a plant can avoid "major  
3    problem spells", there is "virtually no chance" that the plant will be prematurely closed.  
4    The authors define a "major problem spell" as a continuous shutdown of longer than nine  
5    months. Second, if a plant is able to extend its operating license by 20 years, as allowed  
6    under the current NRC regulations, then a plant will be economical even if it were to  
7    experience a "major problem spell" in all but the last 13 years of operation. As I said  
8    earlier, license extension applications have been submitted for five nuclear plants.

9

10   Q.    **What is your reaction to the PUC staff assertions regarding decommissioning  
11   funding versus the rate at which nuclear contamination builds up in the plant?**

12

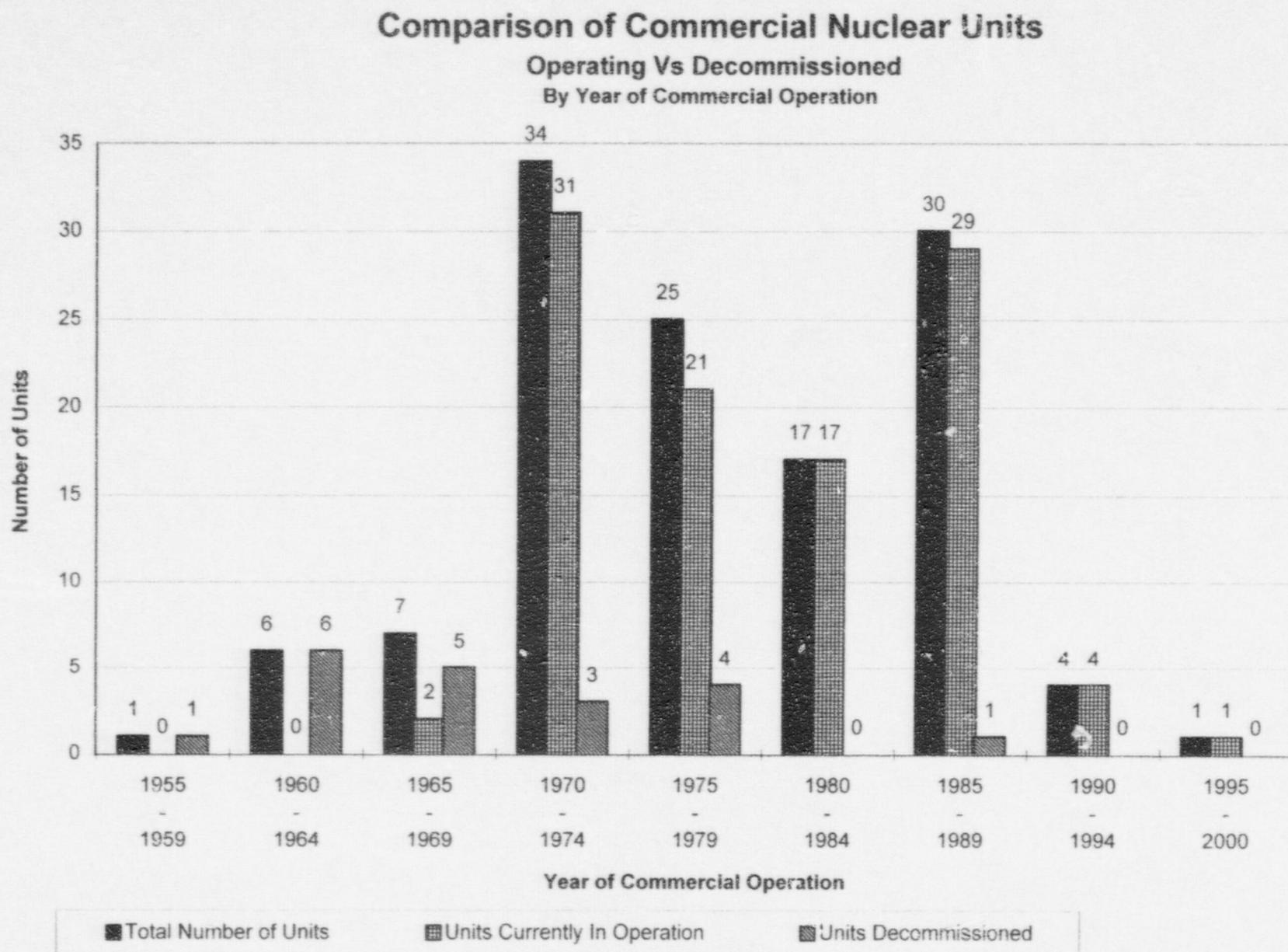
13   A.    It is true that the radioactive contamination of portions of the plant systems occurs  
14   much more rapidly than the rate at which decommissioning funds are accumulated. In  
15   fact, as a practical matter in terms of exposure to decommissioning costs, much of this  
16   contamination occurs very shortly after the plant goes into operation. The expected  
17   decommissioning cost is not particularly sensitive to the years of operation.

18

19   Q.    **Does this complete your testimony?**

20   A.    Yes it does.

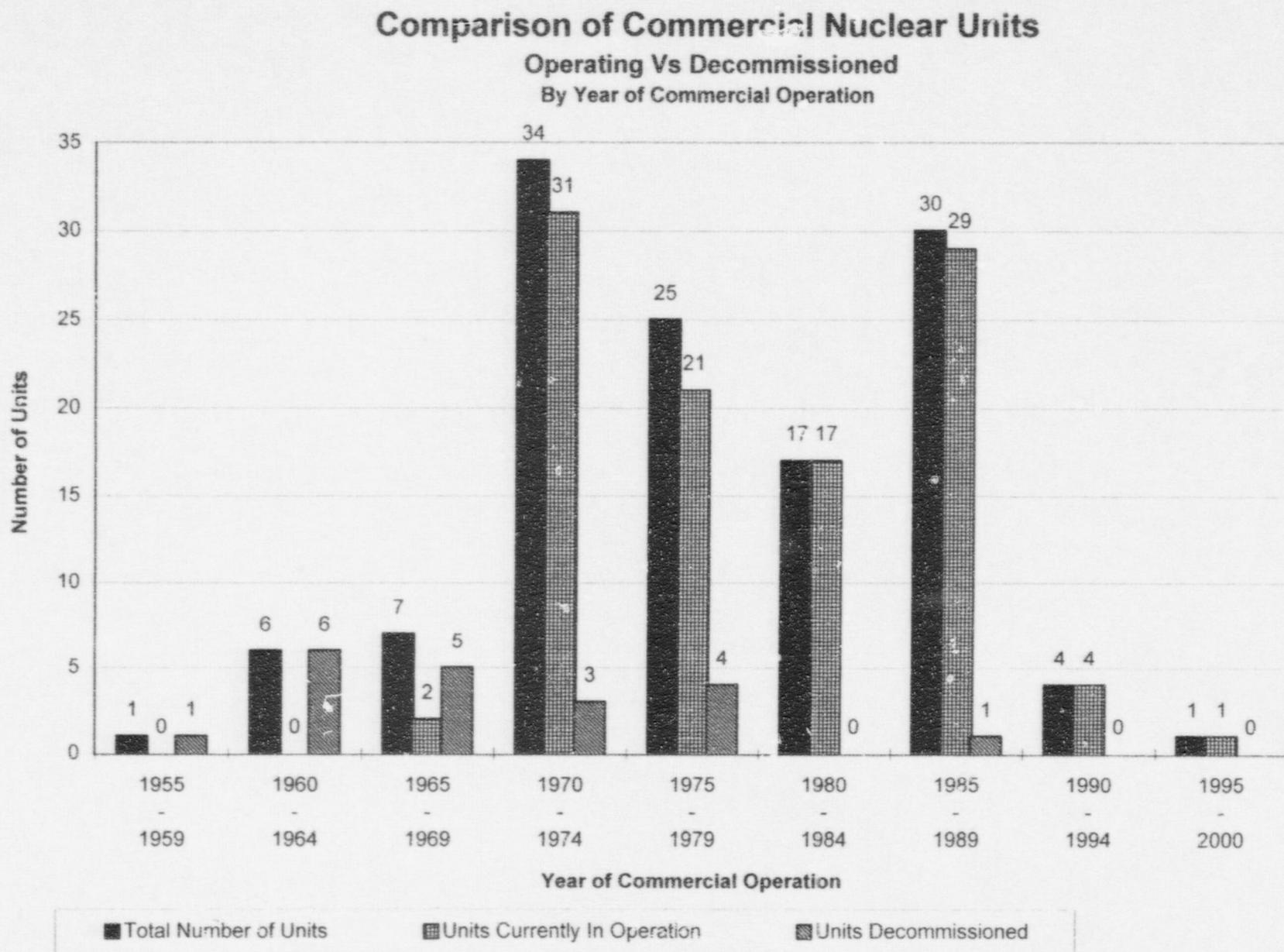
Attachment 1



Attachment to Rebuttal Testimony of A. M. Callendrello

Attachment 1

Attachment to Rebuttal Testimony of A. M. Callendrello



## REBUTTAL TESTIMONY

of

Thomas S. LaGuardia

5 Q. Are you the same Thomas S. LaGuardia that filed direct testimony for these  
6 proceedings?

8 A. Yes I am.

9

10 Q. What is the purpose of your testimony?

11

12 A. The purpose of my testimony is to rebut and clarify certain of the contentions and  
13 positions in the direct testimony filed by Robert A. Backus on behalf of the Campaign for  
14 Ratepayer's Rights.

15

16      Do you believe it is appropriate for North Atlantic to rely upon the NRC's  
17      certification amount of \$489 million instead of its lower, site-specific estimate as a  
18      basis for funding the decommissioning of Seabrook Station?

19

20 A. Yes. The site-specific estimate, as reported in the "Seabrook Station  
21 Decommissioning Update," issued in March 1998, is reported at \$473.6 million in 1998  
22 dollars. This value is approximately \$15.4 million dollars below the NRC's current

1 specified level for funding certification. In Section IV of its March 1998  
2 decommissioning update for Seabrook Station North Atlantic has stated its reasons for its  
3 position that the NRC's requirements are excessive. Also, as indicated in the March  
4 report, funding to the higher level assures compliance with the promulgated regulations.  
5 Due to the small difference in the two values (3.25%), the impact on the associated  
6 revenue collection is small. However, the use of the NRC value is required to maintain  
7 compliance with the NRC's regulations.

8

9 **Q. Does reliance upon the NRC's certification value imply its acceptance or**  
10 **accuracy by North Atlantic or the nuclear industry?**

11

12 A. No. North Atlantic is simply using the NRC's value as a proxy in its financial  
13 planning. It is reasonable to assume that North Atlantic will reassess this position once  
14 the NRC has corrected the known deficiencies in the certification process.

15

16 **Q. Do you agree with Mr. Backus that the site-specific estimate for Seabrook**  
17 **appears to underestimate the cost of decommissioning, based upon the estimates for**  
18 **recently shutdown and smaller units?**

19

20 A. No. The units cited were all shutdown prematurely, as acknowledged by Mr.  
21 Backus. Decommissioning was unplanned for, and the utilities involved were  
22 unprepared. Considerable costs were incurred in the transitioning of the operating

1 infrastructure to smaller and more efficient decommissioning organizations. Spent fuel,  
2 which would have been addressed throughout the normal operating life of the units,  
3 became an additional expense to be addressed during decommissioning. Spent fuel  
4 management costs accounted for approximately 25% of the total estimate to  
5 decommission the Maine Yankee unit. There is no justification to include a cost of this  
6 magnitude in the funding for Seabrook, given its remaining life and the current efforts by  
7 U.S. utilities to compel the U.S. DOE to either accept fuel or provide compensation for  
8 interim storage at the reactor sites.

9

10 **Q. Should the Company, as Mr. Backus contends, base their funding on the**  
11 **highest cost alternative?**

12

13 A. No. The SAFSTOR and ENTOMB alternatives both defer decommissioning, and  
14 as a result, are not only more costly, but present additional risk to both the Company and  
15 the customer. The regulatory and political environment over a 60 year storage period can  
16 be significantly different than currently envisioned. The risk that the financial  
17 instruments chosen today will be responsive over this period of time so as to produce  
18 sufficient revenues to accomplish the decommissioning adds uncertainty to the funding  
19 plan.

20

21 The DECON (prompt removal/dismantling), alternative is not the only method of  
22 decommissioning, but it is the superior alternative in the decontamination and

1 dismantling of retired nuclear facilities. The cost and risk associated with deferred  
2 decommissioning methods are considerably higher based upon TLG's experience.

3

4 **Q. What is the preferred alternative for financial planning?**

5

6 A. The overwhelming majority of utilities use the DECON alternative as a basis for  
7 financial planning. This is consistent with the NRC's use of the DECON alternative in  
8 the establishment of minimum funding requirements for decommissioning, i.e., through  
9 the certification formula codified in 10 CFR 50.75. Prompt remediation is favored by  
10 most utilities as it results in the removal of the radioactivity at the site and the termination  
11 of the operating license in the shortest possible time. Furthermore, the DECON  
12 alternative avoids the long-term costs and commitments associated with the maintenance,  
13 surveillance and security requirements for the conventional delayed dismantling  
14 alternatives.

15

16 Prompt remediation of the site allows use of the plant's knowledgeable operating staff, a  
17 valuable asset to a well managed, efficient decommissioning program. The equipment  
18 needed to support decommissioning operations such as cranes, ventilation systems and  
19 radwaste processing equipment is also fully operational. In addition, the site would be  
20 available for alternative use in the near term.

21

1 Consumers Power had used the SAFSTOR alternative as a funding basis for the  
2 decommissioning planning for the Big Rock Point Plant. However, with the cessation of  
3 permanent operations, the utility announced that they would proceed with immediate  
4 dismantling. In the testimony of Mr. Kenneth Power, the General Site Manager, before  
5 the Michigan Public Service Commission, the advantages offered by the change in  
6 decommissioning alternative were identified as follows: "One important advantage is that  
7 by immediately proceeding into a DECON mode, employee displacement is minimized  
8 and people who have long term experience operating plant equipment are available to  
9 safely and efficiently support the dismantlement. People who have long term experience  
10 operating plant equipment can function more safely and efficiently and without training  
11 related to radioactive materials. A second important advantage is that equipment such as  
12 radioactive waste processing systems and the various cranes on site are still in good  
13 working order. This is less likely to be true without additional expenditures after a  
14 prolonged SAFSTOR period."

15

16 **Q. Mr. Backus has provided a table identifying the decommissioning status of**  
17 **shutdown reactors. Do you agree with the information presented, and the**  
18 **implication that SAFSTOR is the industry's alternative of choice?**

19

20 A. No. The "official" status of a reactor can be misleading. Eleven reactors are  
21 designated as being in safe-storage. However, due to the increasing costs associated with  
22 this method, at least six of the owners are evaluating an accelerated decommissioning

1 program. For example, Pacific Gas & Electric recently spent approximately \$10 million  
2 dollars to halt the intrusion of ground water into the lower elevations of the Reactor  
3 Building. In this high seismic area, PG&E is now reconsidering its SAFSTOR strategy  
4 and evaluating a more near-term solution. Sacramento Municipal Utility District has  
5 been actively "decommissioning" secondary side systems at the Rancho Seco unit and is  
6 planning to expand its efforts into other plant areas. Remediation work is underway at  
7 the Dresden 1 and Fermi 1 reactors. Southern California Edison is also evaluating the  
8 accelerated decommissioning of its SONGS Unit 1. TLG's experience has been that,  
9 when possible, reactor owners will elect to decommission promptly and avoid the  
10 uncertainties of deferral.

11

12 Q. Does this complete your testimony?

13

14 A. Yes.